KYRGYZ REPUBLIC ROAD CRASH DATA REVIEW AND REPORTING

STATUS AND RECOMMENDATIONS

MARCH 2025

CAREC
Central Asia Regional Economic Cooperation Program

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On the cover (left to right): Trucks from Kyrgyzstan on the way to Dushanbe; Cars travelling on the upgraded roads in the Kyrgyz Republic.

Cover design by Josef Ilumin.

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Abbreviations

AASHTO	American Association of State Highway Transportation Officials
ADB	Asian Development Bank
AIS	Abbreviated Injury Scale
APRSO	Asia Pacific Road Safety Observatory
BAAC	Bulletin d'Analyse des Accidents Corporels de la Circulation
CADaS	Common Accident Data Set
CARE	European Commission community database on road accidents
CAREC	Central Asia Regional Economic Cooperation
COVID-19	coronavirus disease
ETSC	European Transport Safety Commission
GIS	geographic information system
ICD	International Classification of Diseases
MAIS	Maximum Abbreviated Injury Scale
MOIA	Ministry of Internal Affairs
MOH	Ministry of Health
MOTC	Ministry of Transport and Communication
NSC	National Statistical Committee
ONISR	Observatory for Road Safety
SPI	Safety Performance Indicator
STBA	German Federal Statistics Office
WHO	World Health Organization

1 Introduction

This report presents an overview of the current road crash data management situation in the **Kyrgyz Republic**, 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 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.

[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, WHO, Global Road Safety Facility.

Since a road safety observatory strongly depends 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.

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 (WHO), the 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 the Kyrgyz Republic**.

[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.*

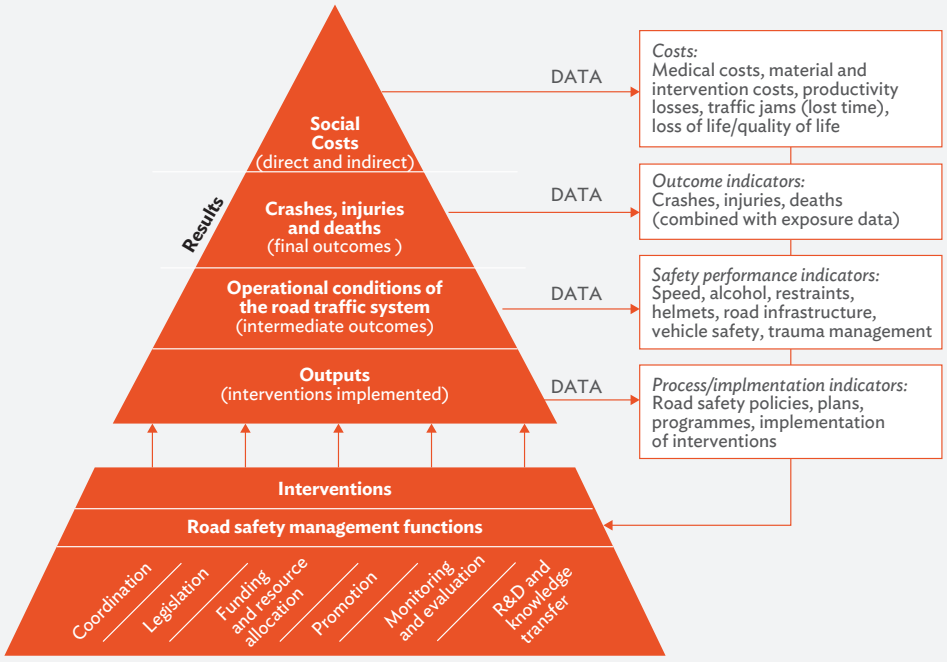
The rationale is that data at all levels of the pyramid are necessary to describe and understand the process leading to crashes. This knowledge then serves as the basis for evidence-based road safety management. The road safety information framework according to this philosophy is visualized in Figure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

The pyramid has four levels. In 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**. These are parameters that have a causal relationship with crashes, casualties, and 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 nationwide 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 crash scenes that result in death or injury.
- A unique and comprehensive road crash registration system is in place, allowing for collection of at least a minimum set of consistently defined and measured 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 in the importance of road crash data and in 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 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 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)		MAIS injury severity
Speed limit		
Surface conditions (dry, snow/ice, wet, slippery)		
Crash severity		

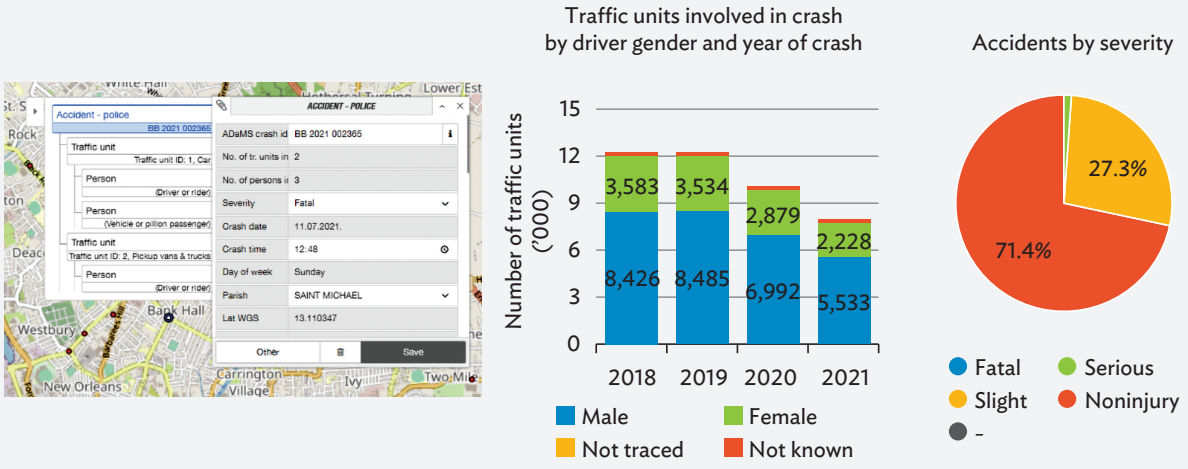
Source: World Bank Guidelines for conducting road safety data reviews.

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 highly 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 (e.g., ABS, ESC, etc.).

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 being 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 these reference standards described that will be considered when assessing the existing road crash data framework of the Kyrgyz Republic.

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

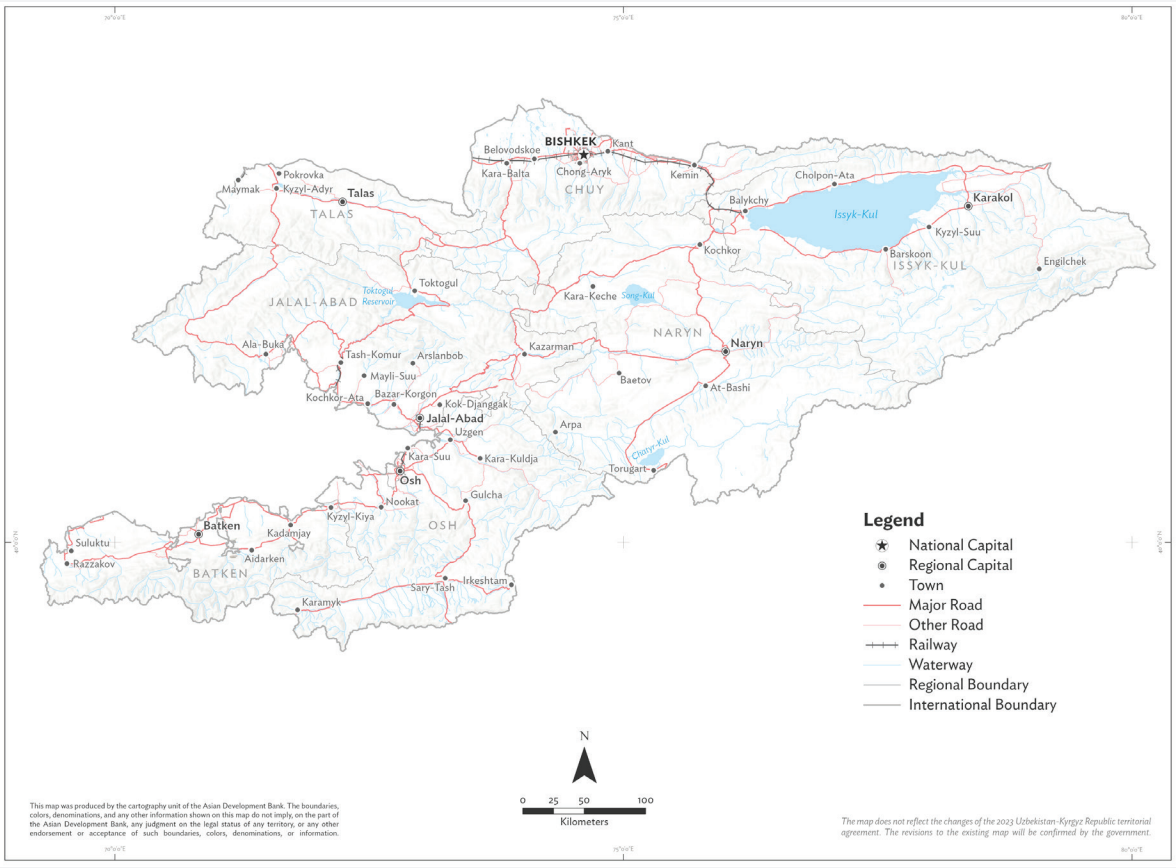
Source: FRED Engineering

[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

The Kyrgyz Republic, situated in the Central Asian region, boasts a diverse history and culture, characterized by a captivating blend of mountainous and steppe landscapes (Figure 4). While the country has encountered economic challenges, it has also witnessed substantial growth attributed to its natural resources and agricultural sector. Nevertheless, political instability has intermittently hindered sustained economic development.

Figure 4: Map of Kyrgyz Republic

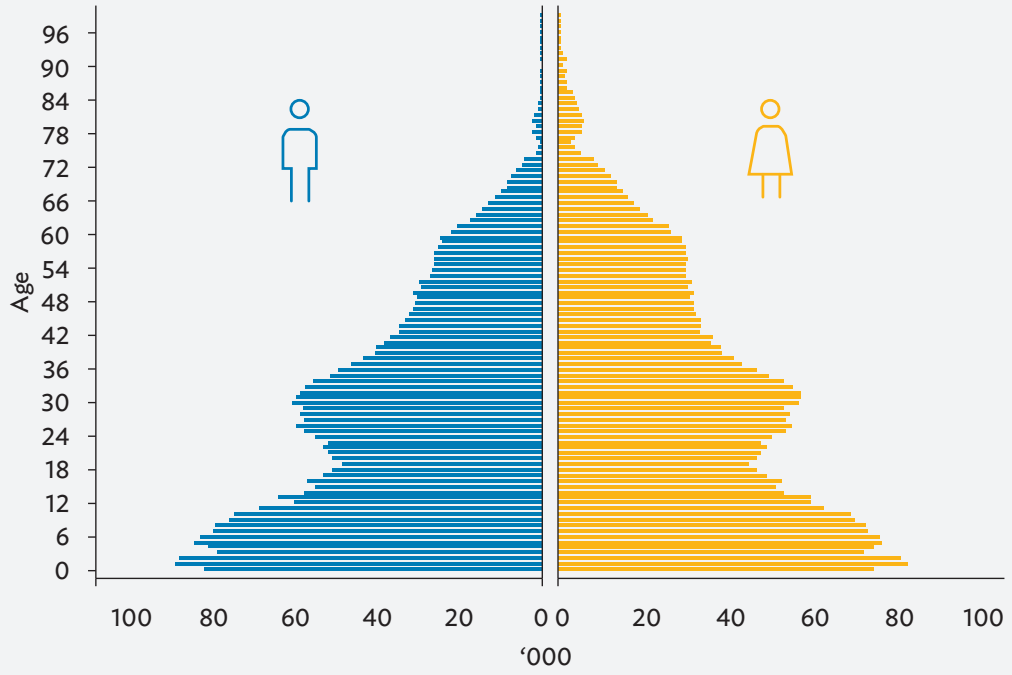


Source: Asian Development Bank.

From 2016 to 2020, the resident population of the Kyrgyz Republic increased by 8.1%. As of 1 January 2021, the estimated population reached about 6.6 million people, almost equally distributed between females and males (Figure 5).

Gender distribution across the country is uneven. Urban areas exhibit a higher proportion of females at 52.3%, whereas in rural areas, where the birth rate is elevated, males predominate at 50.7% (Figure 4).

Figure 5: Population by Age and Gender in the Kyrgyz Republic (2021)



Source: National Statistical Committee of the Kyrgyz Republic

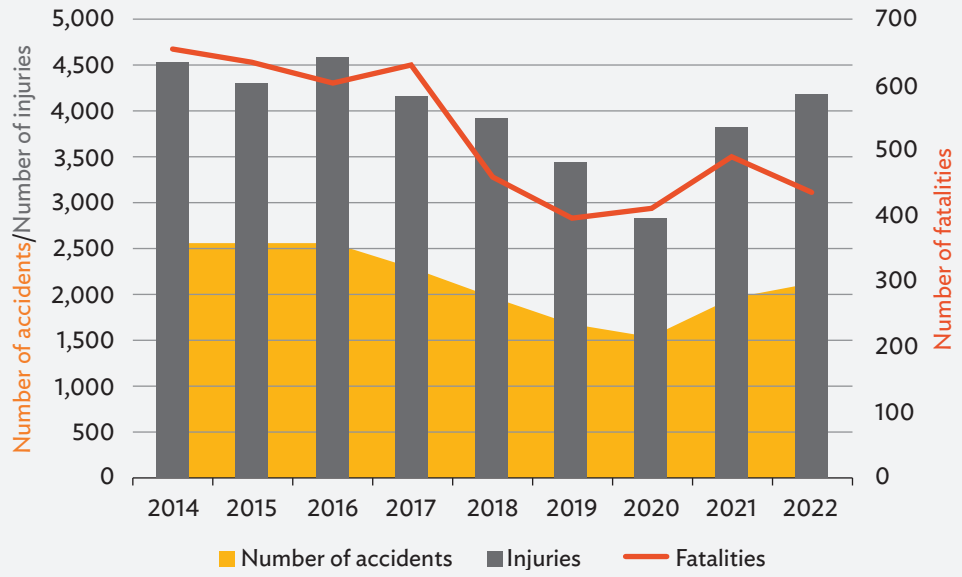
From 2014 to 2022, a total of 4,661 people has been killed in road traffic crashes, while 35,163 people have been injured in the Kyrgyz Republic. A summary examination of road crash statistics, shown in Figure 6, provides insights into changing trends over this period.

Between 2014 and 2016, the incidence of road crashes remained relatively stable, averaging 2,583 road crashes by year. However, from 2017 to 2020, a noteworthy change in trend emerged, characterized by a consistent annual decline in the number of road crashes. This reduction was accompanied by a proportional decline in both fatalities and injuries, indicating an overall improvement in road safety.

The year 2020 proved crucial, recording the lowest number of crashes (1,540). This significant decrease can be attributed to global events, including the coronavirus disease (COVID-19) pandemic, which restricted travel not only within the country but also across borders.

However, successive data reveal a change in trajectory. Starting in 2020, an upward trend can be seen as the number of crashes has begun to rise again. This change underscores the need for constant vigilance and a proactive approach to address emerging road safety challenges. It emphasizes the crucial importance of monitoring and responding to changing crash patterns to further support and increase road safety efforts in the Kyrgyz Republic.

Figure 6: Trend of Road Crashes, Fatalities, and Injuries from 2014 to 2022



Source: National Statistical Committee

On average, 2,148 road crashes have been recorded each year (from 2014 to 2022). On average, 419 road crashes (19% of all crashes) involved fatalities and 1,940 road crashes (90% of all crashes) involved injuries. On average, each year 526 road users involved in these crashes are killed (one death out of four road crashes) and 3,975 are injured (1,85 injury per crash). Yearly data is provided in the Table 3.

The trend in the number of road crashes can be divided into two parts: up to 2020 and from 2020 onward (Table 4).

Table 3 – Number of Road Crashes, Fatalities, and Injuries from 2014 to 2022

Year	No. of crashes:			No. of fatalities	No. of injuries
	Total	Involving fatality	Involving injury		
2014	2,582	514	2,320	656	4,533
2015	2,581	633	2,299	637	4,305
2016	2,588	472	2,335	603	4,597
2017	2,287	462	2,024	632	4,156
2018	1,997	374	1,802	462	3,923
2019	1,674	314	1,532	399	3,429
2020	1,540	300	1,405	413	2,834
2021	1,956	363	1,784	490	3,816
2022	2,131	344	1,962	438	4,180
Average	2,148	419	1,940	526	3,975
Total	**19,336**	**3,654**	**17,463**	**4,730**	**35,773**

Source: National Statistical Committee.

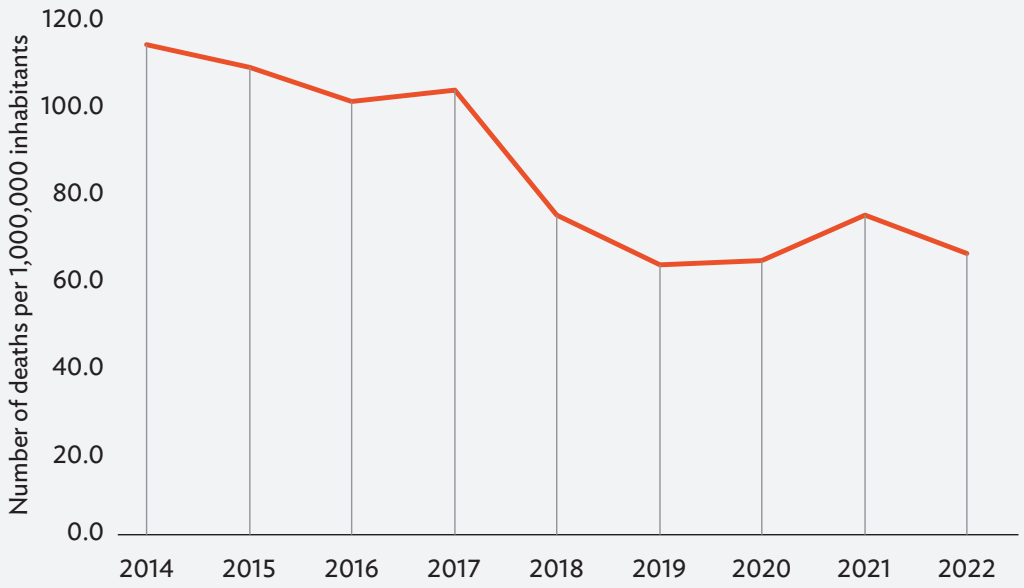
Table 4: Trend in the Number of Crashes

From 2014 up to 2020	From 2020 up to 2022
No. of crashes decreased by **40%**.	No. of crashes increased by **38%**.
No. of fatalities decreased by **37%**.	No. of fatalities increased by **6%**.
No. of injuries decreased by **37%**.	No. of injuries increased by **47%**.

Source: Elaboration from National Statistical Committee.

When rating the number of road crash fatalities with the population, a significant decreasing trend, equal to 43%, is noticed from 2014 to 2022 (Figure 7). During this period, the population increase (by about 970,000 inhabitants) has been accompanied by a substantial decrease in the number of road crash fatalities.

Figure 7: Trend of Fatality Rate from 2014 to 2022



Source: Elaboration from National Statistical Committee and National Statistical Committee of the Kyrgyz Republic

The following list shows the legal base regarding traffic safety and road crash statistics, encompassing their significance, compilation, and related aspects:

- Rules for recording road traffic crashes (amended by the Decree of the Government of the Kyrgyz Republic dated 22 June 2018, No. 299).
- Rules of the road (as amended by the Cabinet of Ministers of the Kyrgyz Republic dated 24 March 2023, No. 165).
- Resolution on approval of the Main Directions for the Development of the Road Industry for 2023–2030 (10 February 2023, No. 71)
- Law of the Kyrgyz Republic about road traffic in the Kyrgyz Republic (as amended by the Laws of the Kyrgyz Republic dated 15 February 2023, No. 27).

- National strategy for road safety in the Kyrgyz Republic for 2023–2027 (application to the resolution of the Cabinet of Ministers of the Kyrgyz Republic dated 6 February 2023, No. 50).
- Order by Ministry of Internal Affairs On approval of the Instructions for improvement and increasing the efficiency of road traffic supervision movement and public order units GUOBDD MIA of the Kyrgyz Republic.

4 Assessment of the Existing Road Crash Data Management Framework

In the Kyrgyz Republic, various stakeholders have a role on road crash data collection and management.

Road crash data with victims (i.e., persons deaths or injured) are mainly collected by **traffic police** (also referred to as Main Directorate for Road Traffic Safety) both for urban and non-urban roads. Traffic police is part of the Ministry of Internal Affairs (MOIA) and is organized at national level with subordinate directorates in the regions and in the city of Bishkek, as well as departments at municipal, district and rural level. The traffic police are primarily responsible for responding to and investigating road crashes. They play a crucial role in collecting initial data at the crash scene, including details about the vehicles involved, individuals injured or killed, and the circumstances surrounding the crash.

Other institutions involved in the road safety process (for collection or use of data on road crashes) are:

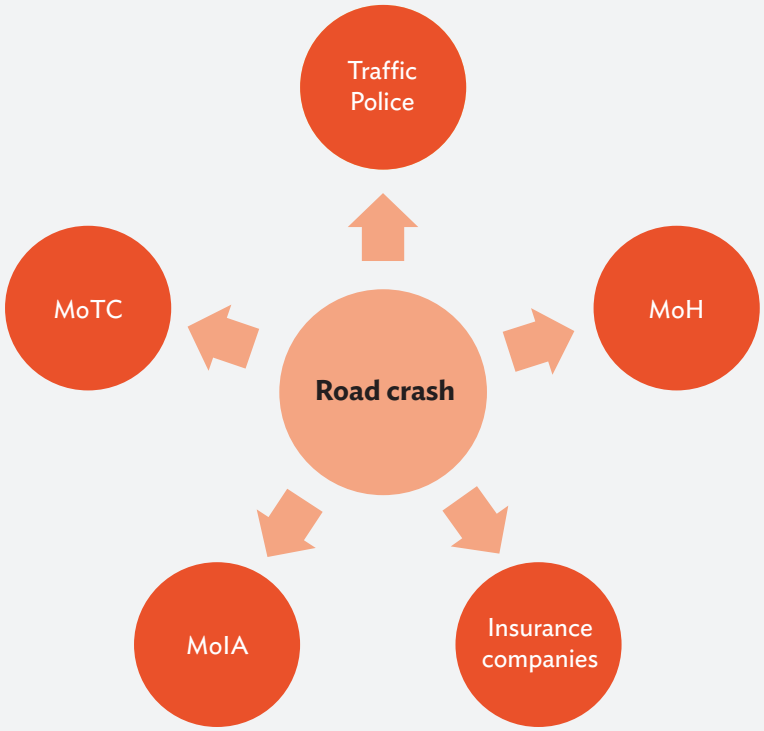
- **Ministry of Internal Affairs** (MOIA), which oversees law enforcement agencies and is responsible for coordinating and managing road crash data at a national level.
- **Ministry of Health** (MOH), which is involved in the collection of data related to injuries and fatalities resulting from road crashes. Hospitals and medical facilities provide information on the severity of injuries sustained by individuals involved in crashes.
- **Ministry of Transport and Communication** (MOTC), which is responsible for coordinating efforts related to road safety, including the collection and analysis of road crash data. It works to identify patterns and factors contributing to road crashes to implement targeted interventions.
- **National Statistical Committee** (NSC), which is involved in the compilation and analysis of road crash data for statistical purposes. It collaborates with other agencies to ensure that data is accurate and reliable for reporting and analysis.
- **Insurance Companies**, which play a role in collecting and managing data related to road crashes, especially when processing claims. They may provide information on financial costs, damage assessments, and liability issues.

The actors involved in the road crash data collection process in the Kyrgyz Republic are shown in the Figure 8, where the yellow circles indicate the actors being mainly sources of data and the green circles indicate the other actors involved mainly in the road safety data management process.

Consultations have been conducted with some agencies. The main purpose of the consultations was to collect available data on road crashes, and to get insight about the current procedures for collecting, managing and analyzing road crash data in the Kyrgyz Republic.

Table 5 lists the stakeholders engaged in consultations and the focus of the meetings.

Figure 8: Agencies Involved in Road Crash Data Management Process in the Kyrgyz Republic



MOIA=Ministry of Internal Affairs, MOTC=Ministry of Transport and Communication, MOH=Ministry of Health

Source: FRED Engineering. Consultations conducted with local stakeholders

Table 5: Stakeholders Consulted

Stakeholder Agency	Meeting focus
Ministry of Health	Practice concerning medical treatment of road traffic casualties
	Injury surveillance system
	Registration level
	Practical implementation
	Consequences of not or incorrectly reporting
Traffic police	Organization of the police
	Crash investigation
	Transmission of data
	Analysis of data
	Crash database

Source: FRED Engineering. Consultations conducted with local stakeholders

An overview of current procedures adopted in the Kyrgyz Republic for road crash data collection and management is described in the following by taking into consideration the reference standards described in Chapter 2.

4.1 Road Crash Data Collection

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

Currently there is no unique notification system in place in the Kyrgyz Republic. Three agencies can be called to attend a road crash scene:

- Traffic police (for all road crash cases).
- Medical aid (in case of crash victims).
- Emergency teams (for situations involving difficulties in extricating the injured, requiring cutting, pulling, etc.).

In the event of a road crash, depending on its severity, victims or witnesses can contact the traffic police (calling 102), an ambulance (calling 103), and if necessary, emergency services (calling 112).

Box 1: Emergency Number – Best Practice Example

Several countries use a unique emergency number to manage all emergency calls flow, which are then transferred to the body in charge of managing the specific emergency (e.g. police, fire brigade, health emergency).

In Saudi Arabia, for instance, the police are notified about the occurrence of a road crash through a call to a unique emergency number: 911. Moreover, the Government of Saudi Arabia has set a specific performance indicator concerning the dispatch time of an emergency response from notification to 911.

Source: World Health Organization (WHO).

The absence of a common notification system is a possible source of underreporting since some crashes could not be reported to traffic police. Typically, a unique notification system allows to reduce the notification times and thereby the probability of serious injuries to become incapacitating or fatal. Intervening on the crash scene in timely manner is also beneficial for road crash data collection since the scene is likely to be less influenced by external factors that could "pollute" the scene.

Currently, there is no unified call center or control room for notifying and recording all road crashes.

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 crash location, the road user types involved, and the nature of injuries sustained by the casualties and the damage sustained by vehicles and property.

Similarly, road traffic crash injury severity also needs to be defined. 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 – death due to injuries sustained during the crash, and the date and time of death is within 30 days of the crash occurrence.

- Serious – hospitalized for more than 24 hours.
- Minor – given first aid at scene or treated in a medical facility as outpatient or discharged from hospital within 24 hours.
- No Injury – no visible injuries sustained.

The term "road traffic crash" is defined in three documents within the Kyrgyz legislation:

- Rules for recording road traffic crashes.
- Law of the road.
- Law about road traffic in the Kyrgyz Republic.

According to these legal acts, road traffic crash means:

> *An event that occurred during the movement of a vehicle on the road and with its participation, in which people were killed or injured, vehicles, cargo, structures were damaged, or material damage was caused.*

According to the laws, a vehicle is defined as the device intended for transportation across roads of people and loads or the equipment installed on it, as well as tractors and self-propelled technological machines. Based on this definition, a road crash should refer both to motorized and non-motorized vehicles.

The terms "Fatality" or "Injury" are defined in the rules for recording road traffic crashes, as follow:

> *Fatality - a person who died at the scene of a road traffic crash or died from its consequences, in the presence of a forensic medical examination confirming that the cause of death was injuries received as a result of a road traffic crash.*

> *Injury - a person who received bodily injuries because of a road traffic crash, resulting in his hospitalization for a period of at least one day or the need for outpatient treatment after first aid.*

Based on the above definitions, differences with international best practices appear in the definition of road crash fatalities. Especially, no time limitation (up to 30 days after the crash) is currently applied. The follow-up of persons injured is made via a report provided by the hospital to the traffic police.

When it comes to road crash injuries, no specific system is in place to distinguish between serious and minor injury. According to the current rules, a person injured but not hospitalized for a period of at least 1 day or not needing outpatient treatment after first aid could be unaccounted for.

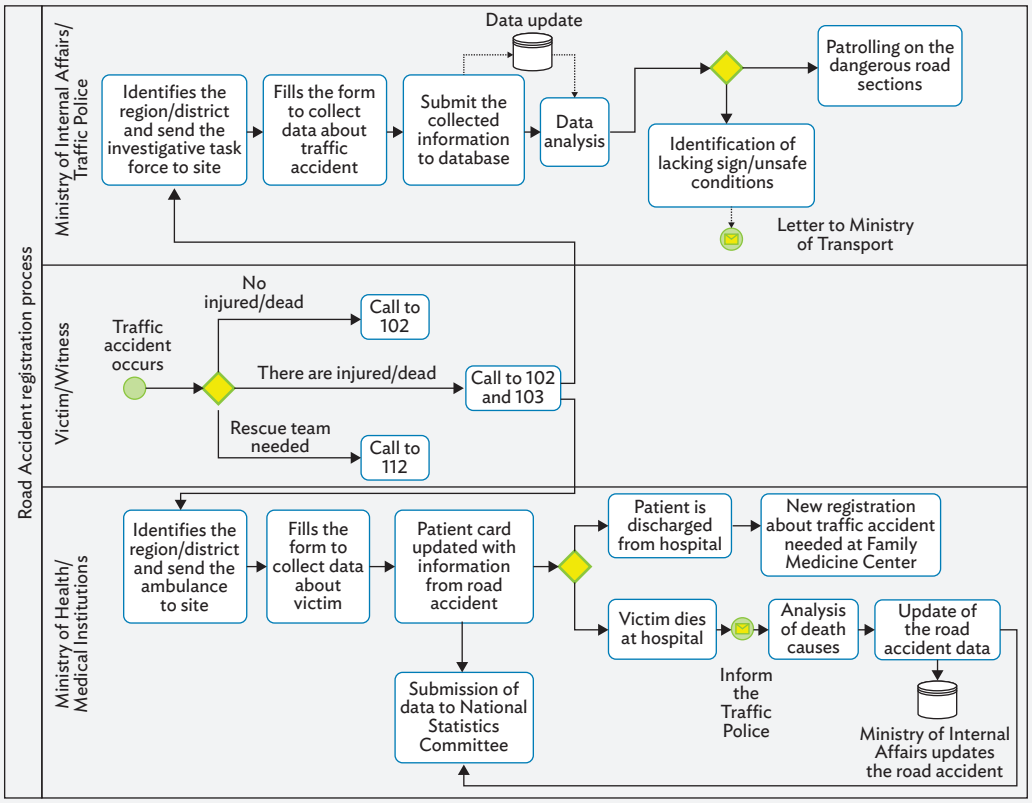
A.3 – Are all road crash scenes with victims attended by police and emergency services?

When receiving a notice about a road crash, a traffic police officer must record a set of information, including the reporter's personal information, crash details, information about victims, medical care provided, medical institutions involved, and details about the vehicles.

Traffic police officers attend all road crash scenes. When a crash is notified, an investigative task force is immediately dispatched to each site. The task force is on duty every day in each district, and immediately responds and travels to the scene regardless of climatic and road conditions. The procedure is compulsorily formalized.

The health and emergency services have also sufficient capabilities to attend all crash scenes, when necessary.

Figure 9: Road Crash Registration Process in the Kyrgyz Republic



Source: FRED Engineering. Consultations conducted with local stakeholders

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

The process of collecting road crash data follows a standardized approach nationwide, as described in Figure 9.

When a road crash occurs, a traffic police officer fills a form, assesses the crash severity, calls for medical assistance (if witnesses or victim did not call before), provides initial aid if needed, and organizes transportation to medical facilities.

The officer identifies the drivers, confiscates driving documents, ensures their presence until an investigative task force arrives, records witness information, and preserves material evidence. The officer reports information to the investigative task force, finds details about a fleeing driver if applicable, and organizes traffic detours if necessary.

Road crashes resulting only in material damage are separately documented by the traffic police officer. In these cases, the officer drafts a protocol including details such as the violation, the crash diagram, the scene inspection, participant and witness explanations, and vehicle inspection report. The crash diagram has not a precise form. Any drawing, plan or scheme can be annexed to the data collection form. The quality is thus arguable since it can vary greatly depending on the person preparing it.

Box 2: 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 Bulletin d'Analyse des Accidents Corporels de la Circulation (BAAC) form. 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

To swiftly clear the roadway after a road crash, the traffic police officer can use aerosol paint to mark vehicle locations, ensuring safe passage for other road users. The officer is responsible for maintaining the safety of the applied paint until the crash is properly recorded.

During road crash investigation, a paper-based form (Annex 1) is filled in. The form is mainly aimed at forensic purposes. A unique case identifier for each road crash is missing. However, place, date and time of form's preparation are recorded.

During the investigation, no scene sketch is prepared (the data collection form does not include this possibility). However, the form includes a section listing the photography, video, audio recording, etc. collected during the site inspection.

Currently, traffic police have no access to online registry of vehicles and drivers, so that details of the vehicles and the drivers involved must be checked manually afterward.

Generally, the law does not confine much the traffic police practices, which are on the contrary determined based on experience and police officers' knowledge.

Traffic crashes in the Kyrgyz Republic are classified into nine categories:

1. Collision with bicycle - a crash in which a vehicle hits a cyclist, or the cyclist collides with a moving vehicle.
2. Collision with carriages and animals - a crash in which a vehicle collides with harnessed animals, as well as with carts transported by these animals, or harnessed animals or carts transported by these animals hit a moving vehicle. This type also includes a hit-and-run collision with an animal.
3. Collision with obstacle - a crash in which a vehicle collides with or strikes a fixed object (bridge support, pole, tree, fence, etc.).
4. Pedestrian crash - a crash in which a vehicle collides with a person, or the person collides with a moving vehicle. This type also includes crashes in which pedestrians are hit by a load or object carried by the vehicle (boards, containers, rope, etc.).
5. Collision - a crash in which moving vehicles collide with each other or with railway rolling stock. This type also includes collisions with a suddenly stopped vehicle (before traffic lights, traffic jam or due to a technical fault) and collisions of railway rolling stock with a vehicle stopped (left) on the tracks.

6. Passenger fall - a crash in which a passenger falls from a moving vehicle or in the passenger compartment (body) of a moving vehicle because of a sudden change of speed or trajectory of movement, etc., if it cannot be attributed to another type of road traffic crash. Falling of a passenger from a non-moving vehicle while boarding (disembarking) at a bus stop is not a crash.
7. Collision with standing vehicle - a crash in which a moving vehicle collides with a standing vehicle or a trailer or semi-trailer.
8. Overturn - a crash in which a moving vehicle was overturned.
9. Others - A different type of road traffic crash is a crash that does not belong to the mentioned above types. These include falling of a transported cargo or an object thrown by a wheel onto a person, animal or other vehicle, collision with persons who are not road users, collision with a suddenly appeared obstacle (fallen cargo, detached wheel, etc.), etc.

Table 6 shows the road crash variables collected at crash scenes in the Kyrgyz Republic and compares them with the European Union standards (the common field are highlighted). Especially, the Common CADaS is used for comparison (Table 6 shows both the full CADaS variables and the simplified ones).

Table 6: Road Crash Variables Collected in the Kyrgyz Republic Compared to CADaS

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

continued on next page

Table 6 *continued*

Variable	CADaS	MINI-CADaS	Kyrgyz Republic
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	✓		
Hit & Run	✓	✓	
Registration country	✓	✓	
PERSON			
Person ID	✓	✓	
Year of birth	✓	✓	
Gender	✓	✓	
Nationality	✓	✓	
Injury severity as reported	✓	✓	✓
Road user type	✓	✓	
Alcotest	✓		

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Table 6 *continued*

Variable	CADaS	MINI-CADaS	Kyrgyz Republic
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 Accident Data Set, MAIS = Maximum Abbreviated Injury Scale

Source: Mobility and Transport Department, European Commission.

The current framework lacks a precise location of the road crash based on GPS coordinates. This causes difficulty in identifying high-risk sites and planning specific interventions.

Currently there is no data matching conducted with hospitals or other agencies to verify the counts of crashes and injuries, as well as to track crash victims.

Injury information can be collected both by traffic police (directly at the crash scene when the victims have not yet been transported to a hospital) or by the hospital where the victims have been admitted. Police officers do not station in hospitals to observe victims' progress. Communication between hospitals and traffic police is made via a report.

Upon receiving a notification about a road crash, the hospitals document all the crash details in a logbook and administer outpatient care or arrange hospitalization based on the severity of the injuries. Subsequently, after the provision of initial assistance, a report is provided to the traffic police concerning the crash. If the patient is transported to the hospital, this information is recorded in the hospital's records. It is important to note that the notification is currently in paper form, lacking an electronic counterpart.

The patient's data is then entered into a medical history, with double coding performed according to the ICD 10[6] protocol. If the patient, after receiving initial care from an ambulance, later visits the hospital, the registration reflects this sequence of events. However, discrepancies can arise between the MOH and the MOIA data, as the MOIA records the location of the crash, while the former records the location of treatment.

Upon the patient's discharge from the hospital, another registration occurs at the Family Medicine Center. Consequently, the same victim of a road crash undergoes two separate registrations. Currently, there is a lack of a unified system between hospitals and Family Medicine Center. There is no unified electronic card in the MoH or

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

in the hospitals. Consequently, MOH faces challenges in tracking patients. Efforts are being made to implement an outpatient card, allowing for a single registration based on the place of treatment.

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

The current data collection process in the Kyrgyz Republic has some drawbacks limiting the reliability of data and the analysis capabilities. Currently, few statistical analyses are possible using the data collected by traffic police (refer to section 4.4).

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

Currently, the system adopted by traffic police to collect road crash data does not allow for precisely recording crash location. The currently used data collection form refers to crash location via information to be written by the officer in charge of collection.

GPS coordinates cannot be recorded in the form.

The location is thus given by writing an address or close location where the crash has occurred. This is also because data collection at the crash scene is not performed by using electronic devices. Nowadays, the use of mobile devices (e.g., smartphones, tablets) easily allows of indicating a crash location directly on the map. The use of geographic coordinates to report a crash is not only easy but also recommended by international good practices.

Box 3: 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 .

4.2 Storage, Processing, and Use of Road Crash Data

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

Traffic police use a paper-based data collection system based on forms. After the crash, the data is uploaded to a **central crash database at the General Department of State Traffic Police**. The current road crash database software lacks GIS features and other mapping tools. Current crash data collection system has been in place since 1991. The last modifications to the scope of the crash data collected was done in 2006. Development of a new electronic database “Road Traffic Crash” is envisaged by the State Program on Road Safety 2019–2023. The

General Department of State Traffic Police of the MOIA is responsible for the new database development during the period of 2019–2020.

The hospitals also maintain a logbook for all the patients treated (including road crash victims). However, the logbook is not necessarily transferred to traffic police or to a central database. Traffic police is informed about the status of crash crashes through a report.

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

While all the traffic police data (at national level) are regularly registered into the central crash database at the General Department of State Traffic Police, it cannot be considered as a proper **national road crash database**.

The system allows for storing the data collected by traffic police. It is not set up to include crash data collected by other sources (e.g., health services, insurance) or to store or link to other road safety data (e.g., risk exposure data, SPIs).

MOH and MOIA own separate databases for recording road crashes and victims which are not connected and it is not possible to exchange information between these databases. A comparison of information is done manually at the end of the year by state prosecutors.

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

The traffic police database is currently not open to external users outside the traffic police. Data can be shared with other stakeholders based on requests.

At the moment, the data accessibility is limited. Road crash data and statistics can be obtained by some agencies (e.g., MOTC) on request, which makes it difficult to conduct systematic and in-depth analysis of road crashes.

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

The central crash database at the General Department of State Traffic Police is mainly used for storage of road crash data but not to perform road crash analysis.

There is currently no system in place giving the possibility of visualizing road crashes on a map as well as to work with typical GIS functions (e.g., heatmaps, selection of crashes by location or by area, etc.). Furthermore, the quality of crash location data being collected is not supportive of reliable crash mapping.

Nowadays, the elaboration of data can be greatly facilitated thanks to web tools (such as MS Power BI, Kibana and others), linked to a database.

4.3 Other Road Safety Data

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

Risk exposure data are not systematically collected in the Kyrgyz Republic.

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

Similar to risk exposure data, SPIs are not systematically collected in the Kyrgyz Republic.

4.4 Data Analysis

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

Since data sharing is currently not occurring in a systematic manner, there is no framework for road safety analysis allowing for periodic monitoring of the road safety situation, planning of interventions, or data-led decision-making.

No specific reports are periodically prepared for road traffic crashes. At the moment, no specific maps of road crashes are prepared. However, some high-risk sites are being identified and special traffic control actions are performed at such locations.

The Main Directorate for road safety of the MOIA ("traffic police") is responsible for collecting road crash data and performing its analysis. The responsibilities of the traffic police concerning the gathering and analysis of traffic crashes include:

- Disseminating information to the public, utilizing media channels, regarding the prevailing conditions in road safety and the factors leading to traffic crashes.
- Undertaking immediate actions at the crash site to address emergencies.
- Identifying the factors and circumstances that contribute to the occurrence of road traffic crashes.

Upon analyzing the compiled crash data, the traffic police identify hazardous areas prone to crashes and take the following actions:

- Notification of the MOTC about the unsafe location, specifying the issues observed (e.g., the need of new road sign).
- Undertakes proactive patrolling of high-risk sections or establishes temporary police stations to monitor speed and ensure adherence to traffic regulations.

Hospitals and other medical institutions engaged in crash cases maintain individual records of the number of fatalities, which they then report to the NSC.

While there may be a minor variance in the statistics related to victims, the figures pertaining to fatalities remain stable between traffic police and health organizations. This slight disparity is attributed to the time elapsed between the road crash and the onset of death. The MoH has the authority to register a death because of a road crash, even if it occurs a year later. This practice can result in double counting.

5 Recommendations to Improve Road Crash Data Management

Evidence-based approaches, supported by road crash data and other road safety data, are at the heart of the most effective road safety policies. The availability of good quality road safety data makes it possible to accurately identify problems and assess the effectiveness of potential road safety measures.

Currently, no reliable or complete database on road crashes is established for the whole Kyrgyz Republic. On the contrary, a database is currently maintained by traffic police. Various sources of data exist, but there is no standard and common process at national level. Information is collected in different ways by the actors involved, independent of each other. The current framework has some important challenges, such as:

- There are different stakeholders having a role on road crash data collection and management, however, these agencies are not currently connected to each other in a systematic way and there is no central national database that contains all the relevant road safety information from all the data sources.
- The current database managed by MOIA focuses on the traffic police data and is relatively closed to other stakeholders.
- The number of road crash attributes and variables currently collected is not sufficient to perform complete road safety analysis and to identify the crash contributory factors. The current system is lacking precise information on the crash location.
- The current system used to store the road crash data does not allow to map the data on a GIS and to analyze the geographical crash patterns.

Improving the process of collecting road crash data is a key issue in road safety management, in particular to improve completeness and analysis capabilities of crash data. To this aim, some recommendations should be adopted:

- A **revised data collection form** should be adopted by traffic police for the collection of all fatal and injury crashes. This form should be different from the current form used for forensic purposes. It should also include procedures to identify crash contributing factors (for instance using a Haddon Matrix as described in Chapter 5.1, section A.5).
- Traffic police should continue to follow the current procedures adopted for forensic purposes (especially regarding the crime reporting). However, the collection of data for statistical and road safety analysis should follow a parallel process allowing to retrieve complete information and to follow the victims' status reliably.
- Traffic police should preferably **collect road crash data by electronic means** (e.g., a mobile device) when the crash occurs, directly at the crash scene. This procedure significantly reduces data collection errors. The use of GPS tools and/or GIS based on maps is recommended to increase the accuracy of crash location.

- A common data collection form should be adopted by all **health services** for the collection of data on injured persons. As an alternative, extracting data from the information systems used by hospitals would be beneficial. These data should then be integrated into a common system together with data from other sources.
- A common data collection form should be adopted by all **insurance companies** for the collection of information on crashes without victims. As an alternative, extracting data from the information systems used by insurance companies would be beneficial. These data could then be integrated into a common system together with data from other sources.
- **Train-the-trainer activities** should be regularly organized for officers involved in data collection activities, to ensure the procedures followed are sufficiently homogeneous. The training activities should be extended to as much as possible traffic police officers so that reliable and complete data can be collected across the country, even when a crash investigator cannot attend the crash scene in a timely manner.
- The data collected by different stakeholders (i.e., traffic police, health agencies) should be integrated into a single database and managed by a web-based **road crash data management system** with provision for a follow-up of injured persons, integration of data from different sources, road crash data analysis.
- Once consolidated, road crash data should be made available regularly to all stakeholders having a role in road safety (especially MOTC). This should be done by giving access to all stakeholders to a web-based road crash data management system.
- **Sharing of road crash information and road safety data** should occur periodically and automatically between the various stakeholders having a role in road safety. All authorized stakeholders should be able to draw data directly from the central database to standardize and optimize road safety analysis.
- The whole process and system should be considered as an initial phase for the development of a **National Road Safety Observatory** and for data source to the **Asia Pacific Road Safety Observatory**.

A description of the recommended process for collecting and managing road crash data is provided in the following chapters by taking into consideration the reference standards described in Chapter 2.

5.1 Road Crash Data Collection

A.1 – Common/unique crash notification system

The best international practices entail the availability of a unique point of access (i.e., a phone number) to contact emergency services. Since setting up a unique notification system at national level may require time and a broader decision-making approach, not necessarily limited to road safety aspects, it is recommended that a mechanism is set up for sharing of notification among the actors involved in data collection.

The mechanism could be facilitated by the adoption of software solution (eventually integrated in the road crash data management system) through which the notified actor in turn forward the notification to the other actors.

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

The definitions currently used in the Kyrgyz Republic 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 7). Since AIS system is currently not in place in the Kyrgyz Republic, a gradual approach is recommended to distinguish between serious and minor injuries. Currently, hospitals code patients' disease using the ICD 10 protocol. Consequently, the use of AIS can be feasible. Anyway, the use of MAIS should be started only after the system is fully operational across all the country.

Table 7: Definitions of Road Crash and Injury

Category	Internationally agreed definition
Fatalities	People who die immediately or within 30 days because of a road 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

Currently all road crashes are attended by the traffic police and health services (when there is a victim).

Some actions may be taken to further improve the current situation by:

- Ensuring that the actors involved in road crash data collection always share information about occurrence of crashes, their main outcomes, the need to assess and follow up. This includes for instance the fact that hospitals systematically inform traffic police about the arrival at the hospital of crash victims.
- Ensuring that the data collection procedures are commonly adopted independently of the road crash location.

A.4 – Unique and comprehensive road crash registration system

The recommended road crash data collection process for the Kyrgyz Republic is illustrated in Figure 10. It refers to the situation where information collected by various entities can be merged into a single national road traffic crash database and monitoring of injured persons can be established in a semi-automatic manner.

The 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 secured via appropriate cybersecurity mechanisms to ensure confidentiality, integrity, authentication and non-repudiation of hardware, software and data.

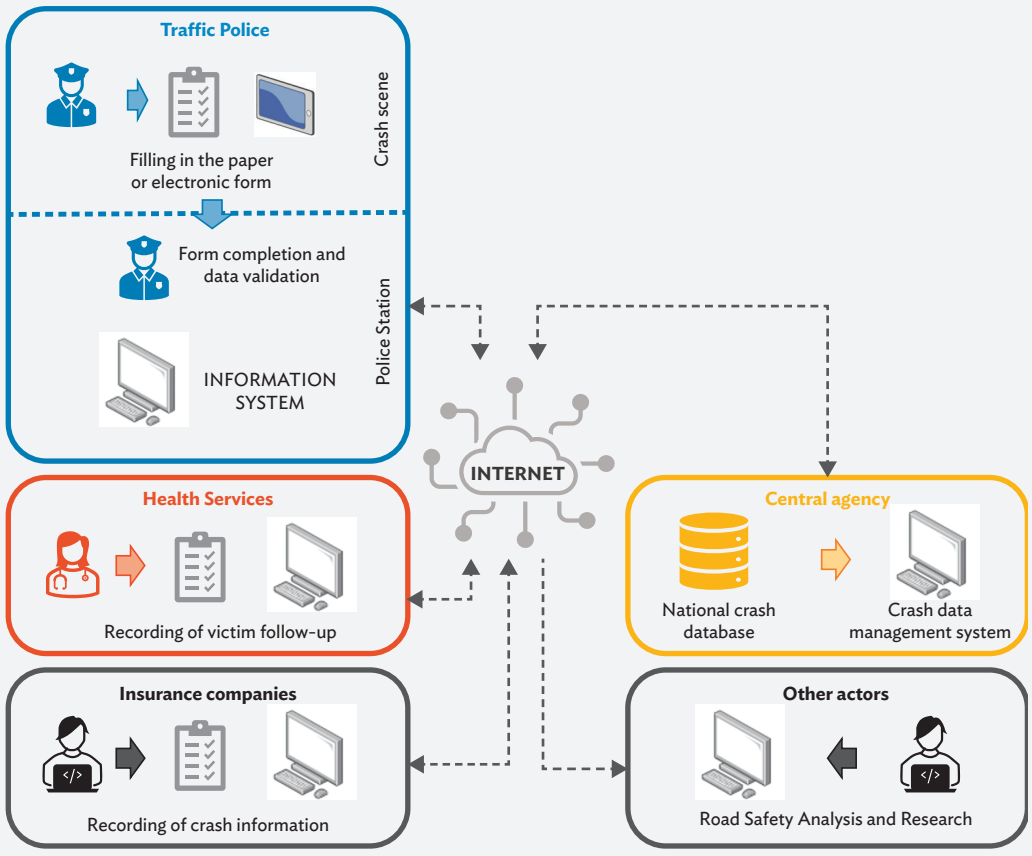
It is important to mention that the current procedures in place in the Kyrgyz Republic for follow up of injured persons can be maintained. Currently, the hospitals keep informed traffic police about the status of road crash victims. This procedure can be further reinforced and facilitated by providing to health services access to an information system allowing to register data about the victims. This would give the possibility to merge data collected by traffic police with those about the victims (collected by health services), and thus to update the status of the victims directly in the national road crash database.

In addition to the follow up of victims, it is recommended to give access to an information system also to insurance companies, so that additional data about vehicles and persons involved in road crashes can collected.

Traffic police, the health services, and insurance companies should be mandated to provide (as much as possible on a daily basis) data on road traffic crashes and injuries and to access the database (through the road crash data management system) for statistical analysis purposes.

Hospitals should be able to track victims of road crashes up to 30 days after the crash and then send the updated information to the national database (through the road crash data management system), so that the injury severity of persons involved in crashes can be updated almost automatically.

Figure 10: Recommended Road Crash Data Management Framework



Source: FRED Engineering.

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

The current data collection process in Kyrgyz Republic has some limitations concerning the reliability of data and the analysis capabilities. Currently, some statistical analysis is possible using the data collected by traffic police. However, they do not allow for a complete understanding of the road crash contributory factors.

A comprehensive and reliable road crash data collection process should allow for:

- The collection of a sufficient set of crash data elements necessary for analysis.
- The use of a single, standardized format for data collection by all entities involved in this task.
- The establishment of reliable and agreed links between stakeholders involved in road safety issues (traffic police, health services, insurance companies, etc.).

A. Traffic Police

The dataset recommended for traffic police is based on the minimum set of standardized data elements of the CADaS recommended by European Commission.

The CADaS data 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 the Kyrgyz Republic should initially comply with a minimum set of data coherent both with the updated version of the Internal Security Forces (ISF) data collection form and with CADaS. Further improvements and updates could be possible in the future.

Table 8 shows the road crash attributes included in the updated version of ISF data collection form and those recommended for addition.

The proposed data collection form should include some important information allowing not only to perform road crash statistics but also to identify crash contributing factors, supporting the selection of reactive and preventive interventions. The following aspects (in addition to the attributes listed in Table 8) should be considered:

- Crash configuration allowing to describe the type of crash in terms of parties involved, type of collision, vehicle / pedestrian maneuver just before the crash and hit and run crash.
- Crash diagrams allowing to visualize the configuration after the crash, including position of vehicles, description of the road environment, eventual traces on the road, etc.
- Crash contributing factors described via a Haddon Matrix (see the following for specific example).

The possibility of performing crash reconstruction for major collisions should be considered as well for future developments, after the data collection process will be revised as proposed and adopted in a standardized manner across the country. Crash reconstruction should entail training dedicated teams (having eventually different expertise) in in-depth investigation techniques.

Table 8: Recommended Dataset for Traffic Police Compared with Current Dataset

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	
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	

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Table 8 *continued*

Attributes	Notes
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	
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 crash contributing factors, it is recommended to use a Haddon Matrix (or similar procedure) which allows to distinguish factors related to human, Vehicle, and infrastructure over three phases of time – pre-crash, crash, and post-crash (Table 9).

Based on the contributing factors identified for every crash in each phase and factor of the Haddon Matrix, further studies can be performed to narrow down the problem statement for each factor and determine solutions to the problem.

Some solutions can be specific to a particular crash site and can be immediately implemented such as road signs, markings, removal of vision obstructions and basic enforcement activities. While other solutions, such as making two-wheelers more stable or safer, need more data for research and development and can take more time, effort, and resources for implementation.

Table 9: 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 Transportation Officials (AASHTO).

B. Health Services

The data collection form for health services should allow the cross-referencing of hospital 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 still allowed).

Figure 11 shows the recommended attributes and variables for health services when treating injured people. It is to note that most of the data will be collected at hospital. The form can be filled in by extracting data from existing information systems of hospitals, when available.

Figure 11: Recommended Dataset for Health Services

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**	
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 - Date of exit		4	Doctor
P13 - Time of exit		5	Nurse
		6	Other

Source: Mobility and Transport Department. European Commission.

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

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 a precise location of road crashes. It is thus highly recommended to include in the future data collection form of traffic police geographical coordinates of the road crashes.

To increase the precision of road crashes' location, it is also recommended to collect the data at the crash scene by using a specifically designed information system. Nowadays, the use of Apps for mobile devices allow to directly locate road crashes on a map.

Figure 12: Recommended Dataset 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		99	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 all actors to store information in a unique National Road Crash Database. The system should be accessible by all actors entitled to collect data (e.g., traffic police, health services, insurance companies) and by all actors entitled to utilize the data (e.g., MOTC).

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 data to be collected at the scene of the crash. This application should allow the information to be sent automatically to a central server hosting the Road Crash Data Management System, without the need for computer downloads. In the event of a temporary absence of an internet connection, the application should be able to store the information collected and be able to send it autonomously as soon as the connection is re-established. This also give the possibility to collect data on a mobile device without the need of having an internet access.
  - Web-based software for desktop data entry (usually used when portable data collection devices are not available). This function gives also 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 either automatically (default output) or because of ad hoc queries by the operator. This module should also allow to merge data collected by different actors (e.g., merging data on victims collected by ISF and health services). This function could also be deployed by linking the system with external tools for data analysis (e.g., MS PowerBI, etc.).
- **Administration module**, which manages the roles assigned to different users, corresponding to different access authorizations to the system functions. This module also manages the national road crash database hosted on a physical or on a virtual server (data validation, downloading, backup, etc.).

It is recommended that the system is web-based (thus allowing to users to access the software via internet or intranet, without having to install it on local computers and devices) and GIS-based (thus allowing to visualize and analyze data through maps able to superpose different layers of information).

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

The systematic storage of data and transfer to the National Road Crash Database is crucial to perform evidence-based and updated road safety analysis. The use of a Road Crash Data Management System for collection of data is highly recommended since it would ensure the regularity of data transfer.

As explained previously, it is also recommended that the system being adopted include an App for mobile devices and that the actors in charge of data collection uses it directly at the crash scene. An interim period can be foreseen before full usage of mobile devices for data collection, during which ISF investigators could continue using paper-based forms. During this period, the data should be transferred from paper to an information system. It is to note that the current practice for crime reporting should remain unchanged.

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

The use of a common (web-based) Road Crash Data Management System would greatly facilitate the accessibility of data by all actors. The system should allow for setting authorizations to different actors based on their roles and functions.

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

Using an information system to manage the National Road Crash Database also allows to use the data directly in that system. Assessing road safety conditions and adopting a data-driven approach to road safety interventions means performing a number of analyses by merging information about the road crashes (final outcomes) with other road safety data.

It is recommended to adopt a framework for road crash data analysis based on the best international practices. Reference can be made, for instance, to the annual report on road casualties from United Kingdom (Department of Transport, 2017) and to 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 to explain road safety outcomes. The most relevant indicator is usually the annual distance traveled. As data of distance traveled (by travel mode, by age) are usually difficult to collect, approximations can be used, such as vehicle fleet size or road length.

Risk exposure data can be divided into three categories: the first one is related to road user, the second one is related to vehicles and the third one is related to the road infrastructure.

Road User

It is recommended to include in the Road Crash Data Management System information related to traffic and multimodal traffic, such as:

- **Vehicle distance traveled** (expressed in kilometers [km]) in total and by transport mode. The indicator should be "Vehicle-kilometer," i.e., a unit of measurement representing the movement of a vehicle over one kilometer.
- **Person distance traveled** (expressed in km) in total, by transport mode and by road user's age and gender. Unit of measurement representing the transport of one passenger by road over one kilometer. The distance to be taken into consideration is the distance actually traveled by the passenger.

These data could not be necessarily available and updated. The main source for these data should be the MOTC.

If available, data on traffic flow from counting campaigns should be included as well, possibly as a geographical information system (e.g., a layer in a GIS map).

Vehicle

It is recommended to include in the Road Crash Data Management System information to the vehicle fleet size (number of vehicles) in total and stratified by type of vehicle.

These data should be easily available based on vehicle registers.

Road Infrastructure

Data concerning the characteristics of the road network are also important to complete road safety analysis. The road infrastructure length in total and stratified by type of road should be considered for inclusion in the Road Crash Data Management System.

The main source for these data should be the MOTC. It is also recommended to include road network data as a geographical information system (e.g., a layer in a GIS map).

C.2 – SPIs included in data collection and storage

Data on **SPIs** can explain a lot about the contributory factors of road crashes.

These data make it possible to assess the risks to which road users are exposed, for example the average speed of vehicles, the rate of use of protective devices (seat belts, helmets, child restraint systems, etc.), the rate of alcohol use while driving, etc. These data can be collected through field surveys (or, in some cases, from analysis of ISF reports).

The following indicators should be considered for inclusion in the Road Crash Data Management System (Table 10).

Table 10 – Recommended SPIs and Sources of Information

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 stakeholders perform analysis using data on road crashes they collect, mainly as part of their daily activities. However, road crash and other road safety data are not systematically analyzed by all stakeholders involved in road safety.

The implementation of the new road crash data system and the consequent establishment of a systematic sharing of data among stakeholders will certainly facilitate a systematic analysis of road crash and other road safety data.

It is recommended to develop data analysis frameworks specific for each stakeholder coherently with their mandated activities and roles. Training activities should be implemented as well to ensure that the persons working with data in the different institutions involved in road safety perform reliable, explanatory analysis.

Annex 1: Road Crash Registration form

Annex 14 to the Rules of Conduct
of the Uniform Crime Register and
misdemeanors

PROTOCOL (report)
scene investigation

_____ "____" _____ 20 ____ г.
(place of composition)

Inspection started _____ time ___
Inspection ended в _____ time ___

_____
(position of the investigator, authorized official of the body of inquiry),

_____ ,
rank, surname, initials)

upon receiving a message _____
(from whom, about what)

_____ ,

arrived _____
(where)

and in the presence of

1. _____
(surname, first name, patronymic

_____
and place of residence of the participant, procedural status)

2. _____
(surname, first name, patronymic

_____
and place of residence of the participant, procedural status)

involving _____
(Procedural position, surname, first name, patronymic of each person,

_____
who participated in the investigative action, and where appropriate

_____
his address and other data on his identity)

_____

in accordance with Articles 163, 165 of the Criminal Procedural Code of the Kyrgyz Republic carried out the inspection _____
(of what)

Before the inspection, the persons involved were explained their rights, responsibilities, and the procedure for the inspection of the scene.

Persons involved:

(signature) (initials, surname)

(signature) (initials, surname)

(signature) (initials, surname)

(signature) (initials, surname)

(signature) (initials, surname)

To a specialist (expert)
(surname, first name, patronymic)
explained his rights, duties and responsibilities under Articles 59, 60 of the Criminal Procedural Code of the Kyrgyz Republic.

(signature of the specialist (expert)

Persons participating in the investigative action were warned in advance on the use of technical means during the investigative action
(which ones
and by whom.)

The examination was performed under the conditions
(weather, light)

Examination reveals:
(what exactly, describe procedural actions
in the order in which they were made, material findings identified in the course of making them
the circumstances of the case, as well as the statements (explanations) of the persons who participated in the case.
in the investigative action; technical means used in the course of the investigative action; and
actions, conditions and procedure for their use, the objects to which these funds have been
applied, and the results obtained)

(signatures of participants) **(Investigator's signature,** UDLOD)

(signatures of participants) (Investigator's signature, UDLOD)

In the course of the inspection, the following was conducted

(photography, video, audio recording, etc.)

In the course of the investigative action, the following were seized

(list of seized

objects with indication of their individual features and characteristics, method of

packaging, sealing (by which seal) and notation of certification by the investigator's signature,

the witnesses and other persons participating in the investigative action, where objects

sent after seizure or where they are subsequently stored)

All detected and seized during the investigative action is presented

to the participants in the investigation.

Attached to the minutes are

(photographic negatives and scans,

films, transparencies, phonograms, video tapes, computer media,

drawings, plans, schemes, impressions and impressions of traces made during the investigative action)

(signatures of participants) (Investigator's signature,

The report have been submitted for familiarization to all persons who participated in the proceedings in the investigative action. At the same time, the above persons were explained their right to make to be entered on the report, stipulated and authenticated by the signatures of these persons comments on its supplementation and clarification. Having familiarized with the report by _____ ,

(personal reading or reading of the protocol by the investigator (inquiry officer)

participants of the investigative action comments on its supplementation and clarification _____ (they didn't,

have done - which ones (specify the procedural position, name

and initials of the participant of the investigative action and the content of the additions made by him/her

and clarifications to the content of the minutes)

Specialist (expert) _____ (signature) _____ (initials, surname)

Other persons involved: _____ (signature) _____ (initials, surname)

_____ (signature) _____ (initials, surname)

_____ (signature) _____ (initials, surname)

This protocol is drawn up in accordance with Article 163 of the CPC KR.

Investigator (authorized official of the body of inquiry) _____

(signature

Traffic crash registration form (original version)

Приложение 14 к Правилам ведения
Единого реестра преступлений и
проступков

ПРОТОКОЛ

осмотра места происшествия

« » г.

_____ ____ _____ 20 ____
(место составления)

Осмотр начат в _____ ч _____ мин
Осмотр окончен ч мин
в _____ _____

_____
(должность следователя, уполномоченного должностного лица органа дознания),

_____ ,
звание, фамилия, инициалы)

получив сообщение _____
(от кого, о чем)

_____ ,

прибыл _____
(куда)

и в присутствии

1. _____
(фамилия, имя, отчество

_____
и место жительства участника, процессуальное положение)

2. _____
(фамилия, имя, отчество

_____
и место жительства участника, процессуальное положение)

с участием _____
(процессуальное положение, фамилия, имя, отчество каждого лица,

_____
участвовавшего в следственном действии, а в необходимых случаях

_____
его адрес и другие данные о его личности)

_____

в соответствии со ст.ст.163, 165 УПК КР произвел осмотр _____
(чего)

Перед началом осмотра участвующим лицам разъяснены их права, ответственность, а также порядок производства осмотра места происшествия.

Участвующие лица:

(подпись) (инициалы, фамилия)

(подпись) (инициалы, фамилия)

(подпись) (инициалы, фамилия)

(подпись) (инициалы, фамилия)

(подпись) (инициалы, фамилия)

Специалисту (эксперту)

(фамилия, имя, отчество)

разъяснены его права, обязанности и ответственность, предусмотренные ст.ст.59, 60 УПК КР.

(подпись специалиста (эксперта)

Лица, участвующие в следственном действии, были заранее предупреждены о применении при производстве следственного действия технических средств

(каких именно

и кем именно)

Осмотр производился в условиях

(погода, освещенность)

Осмотром установлено:

(что именно, описываются процессуальные действия

в том порядке, в каком они производились, выявленные при их производстве существенные

для данного дела обстоятельства, а также излагаются заявления (пояснения) лиц, участвовавших в следственном действии; технические средства, примененные в ходе производства следственного действия, условия и порядок их использования, объекты, к которым эти средства были применены, и полученные результаты)

(подписи участников) **(подпись следователя, УДЛОД)**

(подписи участников) **(подпись следователя, УДЛОД)**

В ходе осмотра проводилась

(фотосъемка, видео-, аудиозапись и т.п.)

При производстве следственного действия изъяты _____
(перечень изъятых

предметов с указанием их индивидуальных признаков и особенностей, способа

упаковки, опечатывания (какой печатью) и отметки о заверении подписями следователя,

понятых и других лиц, участвующих в следственном действии, куда предметы

направлены после изъятия или место их последующего хранения)

Все обнаруженное и изъятое при производстве следственного действия предъявлено
участникам следственного действия.

К протоколу прилагаются _____
(фотографические негативы и снимки,

киноленты, диапозитивы, фонограммы, кассеты видеозаписи, носители компьютерной информации,

чертежи, планы, схемы, слепки и оттиски следов, выполненные при производстве следственного действия)

_____ _____
(подписи участников) **(подпись следователя, УДЛОД)**

Протокол предъявлен для ознакомления всем лицам, участвовавшим в следственном действии. При этом указанным лицам разъяснено их право делать

подлежащие внесению в протокол оговоренные и удостоверенные подписями этих лиц

замечания о его дополнении и уточнении. Ознакомившись с протоколом путем _____

_____ ,
(личного прочтения или оглашения протокола следователем (дознавателем)

участники следственного действия замечания о его дополнении и уточнении _____
(не сделали,

сделали – какие именно (указываются процессуальное положение, фамилия

и инициалы участника следственного действия и содержание сделанных им дополнений

и уточнений к содержанию протокола)

Специалист (эксперт) _____ (подпись) _____ (инициалы, фамилия)

Иные участвующие лица: _____ (подпись) _____ (инициалы, фамилия)

_____ (подпись) _____ (инициалы, фамилия)

_____ (подпись) _____ (инициалы, фамилия)

Настоящий протокол составлен в соответствии со ст.163 УПК КР.

Следователь (уполномоченное должностное лицо органа дознания) _____ (подпись)

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Kyrgyz Republic Road Crash Data Review and Reporting

Status and Recommendations

This report presents an overview of the current road crash data management situation in the Kyrgyz Republic 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.

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