



Crash Data System Country Note

Republic of Armenia



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1. Introduction

The Eastern Partnership (EaP) Road Safety Declaration, signed in 2018 and endorsed by the Ministers of Transport and representatives of the Republic of Armenia, the Republic of Azerbaijan, Belarus¹, Georgia, the Republic of Moldova, and Ukraine, highlights the joint commitment to improving the quality of systematic and consolidated data collection on road traffic fatalities and serious road injuries in line with EU and international best practices, and to reporting this data to the EaP Regional Road Safety Observatory.

The EaP Road Safety Observatory (EaP RSO) is defined as a joint initiative of the six EaP countries with the common goal to advance towards the eradication of fatal and non-fatal road traffic injuries promptly and efficiently by sharing good practices and interchanging data to help create a solid body of evidence-based practice. The Regional Observatory will house country-level data, but more importantly, it will act as a catalyst in developing or strengthening the country-level national road safety observatories housing road safety data beyond that derived from crashes.

In this context, road safety has been prioritized as a key component of the World Bank (WB) support to the EaP Transport Panel, and a preparatory study has been started to support the launch of the EaP RSO hosted by Georgia. The purpose of the study is to explore the current status of existent crash data systems of the EaP countries and to identify the bottlenecks and opportunities for further improvements. A questionnaire survey was distributed among country representatives and interviews were conducted to collect the latest available data and information. The results are presented in the four Country Notes for the Republic of Armenia, the Republic of Azerbaijan, the Republic of Moldova, and Georgia. The current reports update the last edition of the respective Country Notes published by the World Bank in 2017.

¹ Belarus has exited the EaP platform in 2021



2. Road Safety Situation in Armenia

2.1 Evolution of road crashes and casualties over the last decade

About 36,000 road crashes and 52,000 injuries were recorded in Armenia during 2012-2021. Both road crashes and injuries recorded show an increasing trend over this period (with an average annual increase of 7.6%), while annual reductions were recorded only in 2016 (5.8%) and in 2020 (16.3%). In 2021 crashes increased by about 77% and injuries by 79%, compared to 2012 data. The highest number of crashes and injuries was recorded in 2019 (Figure 1).

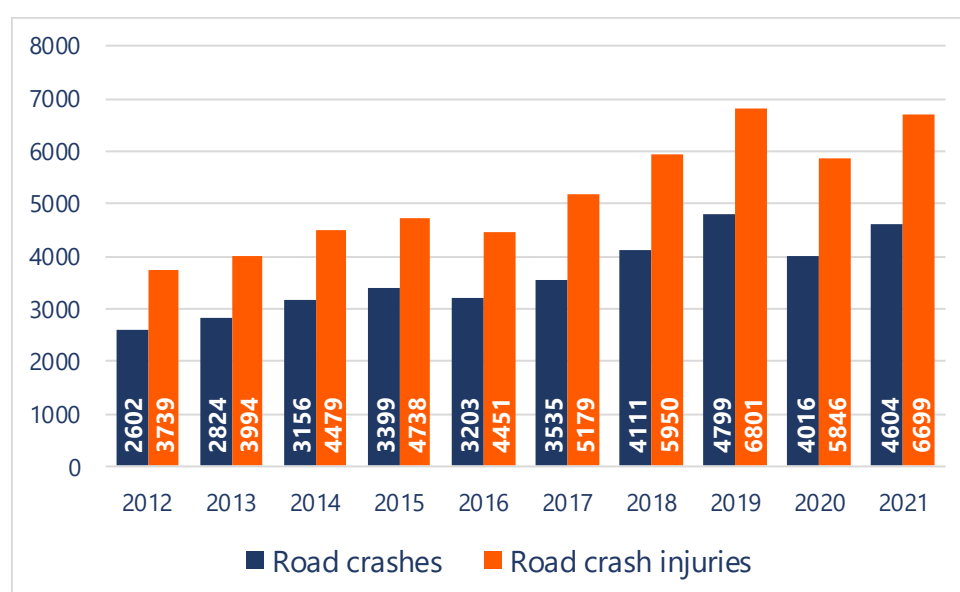


Figure 1. Number of road crashes and injuries in Armenia, 2012-2021
(Source: Road Police of Armenia)

However, the number of road crash fatalities registered fluctuated during the decade 2012-2021, having a slightly decreasing trend within the period of 2012-2016, and a recorder annual increase in 2015. Since 2016 the number of road crash fatalities has increased, with the highest being recorded in 2018 (23%).

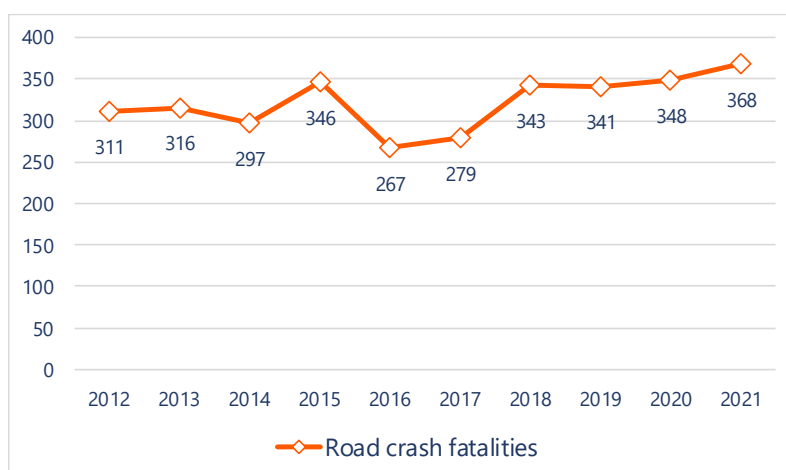


Figure 2. Number of road crash fatalities in Armenia, 2012-2021
(Source: Road Police of Armenia)

As shown above, the number of fatalities increased by 18.3% between 2012 and 2021, an increase which is significantly lower than the respective increase of crashes and injuries recorded over the same period. In general, road crash fatalities numbers do not follow the trends of those of road crashes and injuries. It is to be remarked that while in 2020 road crashes and injuries numbers fell significantly (by 16% and 14% respectively) compared to 2019, the number of fatalities increased.

A significant annual decrease in the number of recorded road fatalities was observed in 2016. Previous assessments of road crash data evolution in Armenia have shown that this was a result of more systematic speed enforcement², with more speed cameras being installed up until the end of 2015. However, further analysis is needed in order to explore the causes of the increasing trend of road fatalities since 2016.

Road crash fatalities increased at a lower rate over the period 2012-2021 compared to the number of crashes and injuries.

More detailed information on the evolution of road crashes and casualties is provided in the “Road Safety Monitoring” section of the national-level road safety status review documents developed by the World Bank ([“Road Safety Country Profiles”](#)).

The issue of underreporting of crashes, road deaths and injuries is likely to have a significant impact on current figures and statistics on road safety in Armenia. Similar to several other Eastern European countries, the problem of underreporting still exists in Armenia. It is not possible to estimate precisely how large the impact of underreporting

² Crash Data Systems in the EaP Countries 2017 - Country Note: Armenia



on official road safety statistics is. The main reason is the lack of information about the road crash injuries and fatalities data exchanged between hospitals and the patrol police, with the latter being responsible for crash data collection.

Armenia does not currently have a valid death registration system, while a preparatory work has begun on its establishment. In the periodic Global Road Safety Status report of 2018³ WHO estimation of the number of fatalities in Armenia in 2016 was 499 compared to 267 fatalities reported by the traffic police.

2.2 Road fatalities per 100.000 inhabitants in 2021

In the next section, traffic-related mortality rates per 100,000 population of the EaP countries are benchmarked against those of the European Union Member States. The Republic of Armenia’s official population data were collected through a questionnaire filled out by national representatives. According to the questionnaire, total population in Armenia in 2021 was 2,968,127.

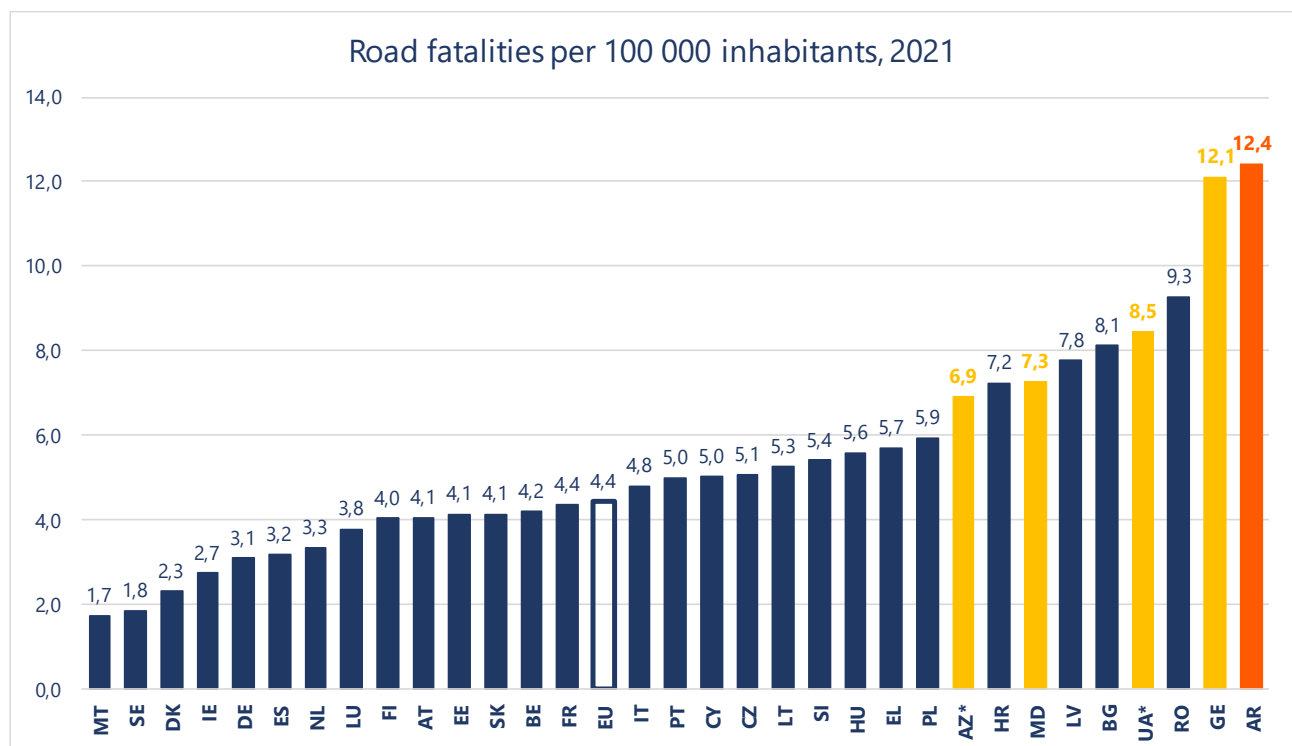


Figure 3. Road crash fatalities per 100.000 inhabitants in the EU Member States and in the EaP Countries, 2021 (* 2020 data).

(Sources: EC CARE Database, Eurostat, World Bank, EaP national sources)

³ https://www.who.int/violence_injury_prevention/road_safety_status/2018/en/



In 2021 Armenia recorded 12.4 fatalities per 100,000 inhabitants, which is the highest among the examined countries (Figure 3).

2.3 Change in the number of road crash fatalities, 2012-2021

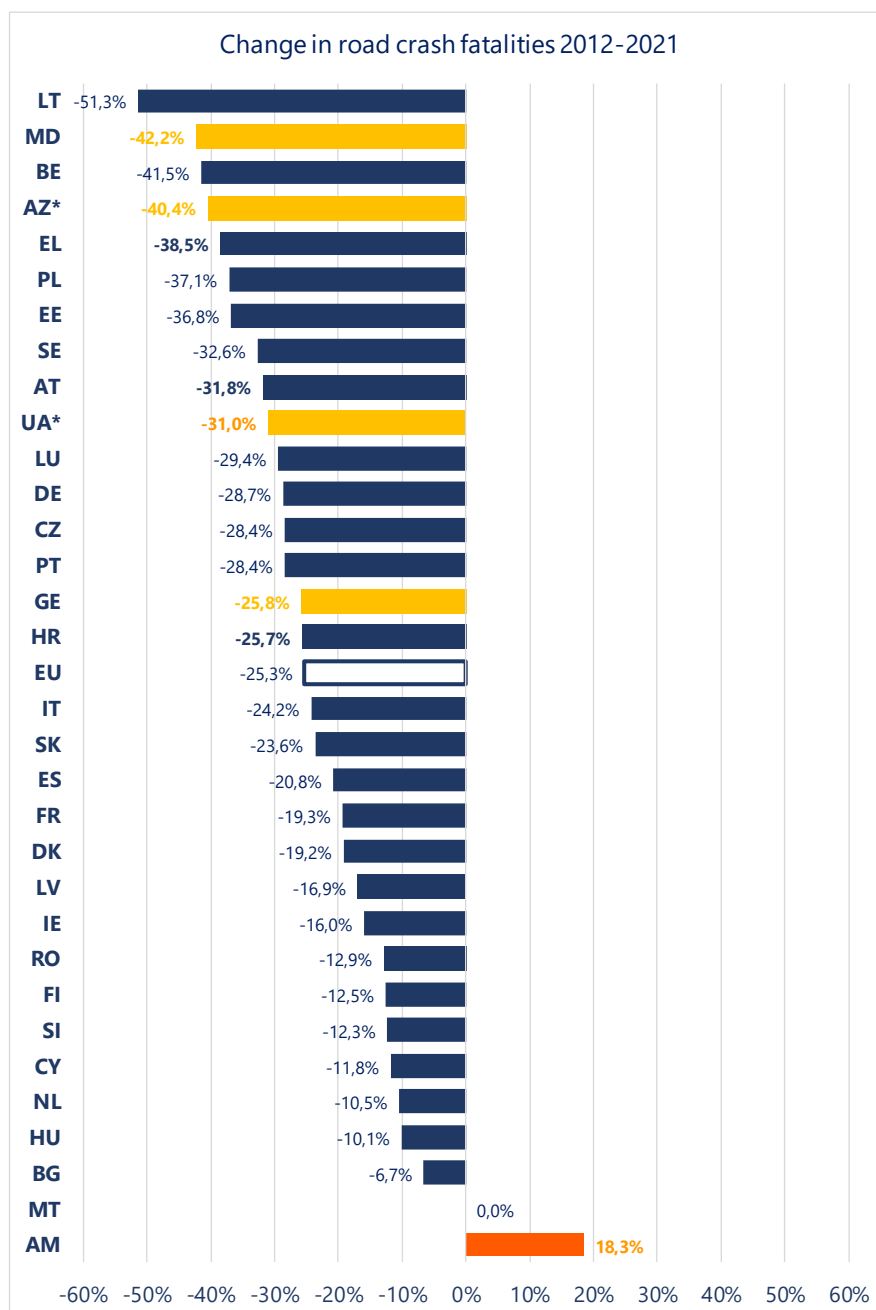


Figure 4. Percentage change in the number of road crash fatalities 2012-2021, EU Member States and EaP Countries.
(Sources: EC CARE Database, EaP national sources)



Figure 4 shows the change in road crash fatalities recorded between 2012 and 2021 for the EU Member States and EaP Countries. In Armenia, the number of fatalities increased by 18.3% between 2012 and 2021, while the number of road crash fatalities in the EU and the other EaP countries decreased.



3. Crash and Road Safety Data Collection

3.1. Crash Database

Road Police is the responsible authority for road crash data collection in Armenia. Road Police use a paper-based data collection system at the scene of a crash and submit it to the road police registration unit within 48 hours. Data are then uploaded to the Digital Register of Road Police, the central database on road crashes.

Road crash data are collected at the crash scene through the crash data collection form. A quality control procedure is conducted by the Patrol Service coordinators within the period of up until the 15th day of the following month after the crash date. Then data are uploaded into the Digital Register.

The crash data collection form was modified in 2019, when the digital database was established, with the data structure and most variables being based on the EC CADaS protocol.

3.2. Database Software

Armenia established a digital database for road crash data (RP Digital Registrar Database) in 2019. The Road Police was the responsible authority for the establishment of the digital database and the development of the currently used software, as well as for the maintenance of the national crash database. Only officials authorised by the Road Police have access to the crash database and can provide regular updates. Data can be exported in MS Excel format for further analysis.

GIS (Geographic Information System) software is not available yet, since not all data are available in digital format. However, GIS features are expected to be introduced in 2023.

3.3 Data on Road Crashes and Injuries

Road crash casualties in Armenia concern killed and injured persons in road crashes. More specifically, the 30-day definition for road crash fatalities applies in Armenia, meaning that road fatalities are considered all persons who succumbed within 30 days since the crash date. The health sector and police collaborate to verify crash data, including fatalities occurred within 30 days after the crash. Road Police officers are responsible for follow up with crash victims admitted to the hospitals. Road Police also record whether a person was killed at the crash scene, succumbed on the way to the hospital or within the period of up to 30 days after the crash occurred.



In terms of the injury severity, there is no differentiation between serious and slight injuries in Armenia, and no international standards are used for the definition and classification of crash injuries.

3.4 Availability of Crash Data

Road Police is the responsible authority for the development and update of the national crash database, with authorised officials having access. Disaggregate crash data are considered confidential, and thus, the central crash database is not openly available to other authorities or to the general public.

Currently, detailed data can be shared with other authorities, agencies, or road safety stakeholders only upon a request. However, there are on-going projects aiming to provide access to the crash database to other related ministries.

Aggregate crash data and statistics are published at www.stats.am; however, it represents only a small part of the dataset.

3.5 Availability of other Road Safety Data

In Armenia a national death registration system does not exist yet. Road Police and medical institutions maintain their own registries concerning deaths. Police and hospital data on road crash fatalities and injuries are not linked. Additionally, Police can have access to hospital data, however, those are not openly available.

Republic of Armenia has established vehicles' and drivers' databases managed by the Road Police, from which the latter is synchronised with the crash database. However, data on drivers and vehicle fleet are considered confidential in Armenia and are not available or shared with third parties.

Road Police also hosts the national database on roads. Road length data for urban roads, interurban roads and motorways are available for 2021. Currently, the Road Police is working on linking road registry with crash database; part of that has already been completed and some identified black spots are available.

Republic of Armenia does not collect data on safety performance indicators, such as: (a) the percentage of car occupants wearing seat belts; (b) the percentage of drivers driving within the legal speed limits; (c) the percentage of moped/motorcycle riders wearing safety helmets, (d) the percentage of drivers driving under the influence of alcohol, etc. Traffic violations, especially speeding, are recorded by video cameras, and these data are stored in a database of Road Police.



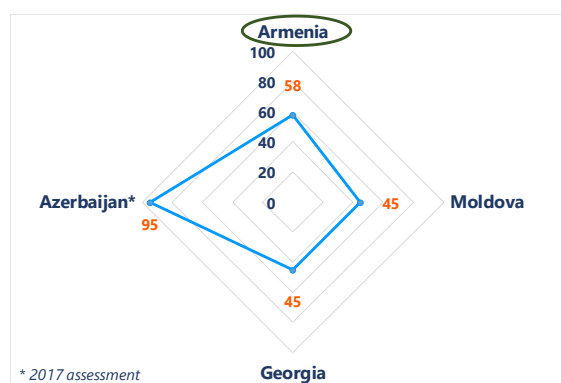
4. Benchmarking of Crash and Road Safety Data Systems

4.1. Impact Indicators used for Benchmarking of Crash Databases

The impact indicators used for benchmarking the crash database systems are based on those of the previous assessment of EaP crash data systems conducted in 2017 by the World Bank⁴: (1) Legislation, (2) Institution, (3) Software platform for crash database, (4) GIS orientation of software platform, (5) WEB orientation of software platform, (6) Database availability, (7) Database updates (8) Willingness to exchange data, (9) Connectivity, (10) Road safety database concept. The definitions of the criteria used are presented below in this section. The results of the benchmarking study are based on the questionnaire survey carried out in the EaP countries. The final scores were assigned based on the answers received from the EaP countries and expert opinion, while a comparison between the assessment results of 2017 and 2022 is provided in the next chapter.⁵

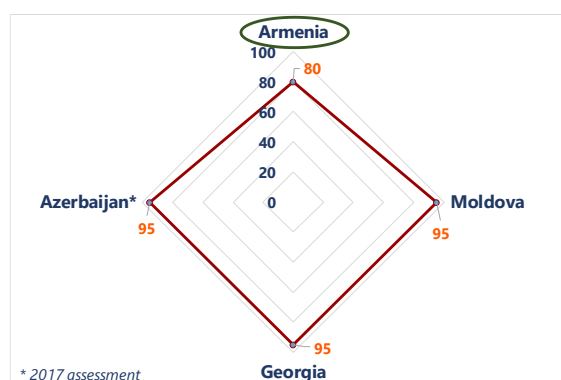
Legislation

Both road safety and crash databases should be referenced in a legal act covering road safety legislation in Armenia. Thus, this indicator measures whether the crash and road safety databases are referenced in a law covering road safety, which prescribes that the establishment and development of a database should be recognized by a legal act.



Institution

This indicator measures whether an institution has been tasked with leading the establishment and development of a road safety database in the country. The underlying question behind this indicator is: Which institution is responsible for establishing and developing the road safety or crash database?



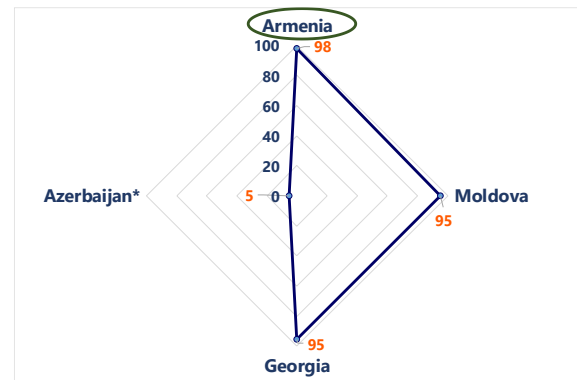
⁴ Crash Data Systems in the EaP Countries 2017- Country Note: Armenia

⁵ It is noted that scores for 2022 are available only for Armenia, Georgia, and Moldova, who participated in the survey, while for Azerbaijan the assessment results of 2017 are shown. Belarus and Ukraine are not included in this updated version of the Country Notes.



Software platform for crash database

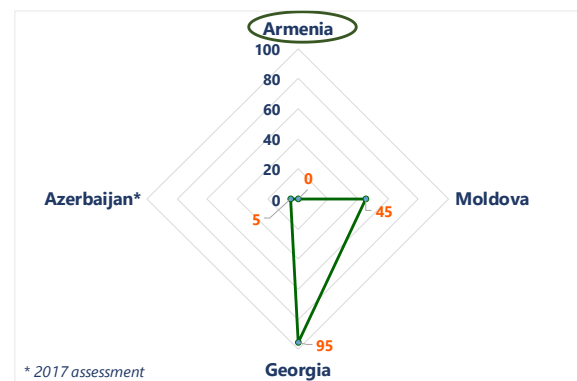
The type of software platform used is a determining factor of the quality of a road safety/crash database. This indicator evaluates the capacity of the software platform to update the data structure in a simple manner, as well as the customizability of the software application to facilitate data input, while allowing for the analysis and exporting of data. Compatibility with other software packages, databases and software tools is equally very important and highly valuable.



GIS orientation of software platform

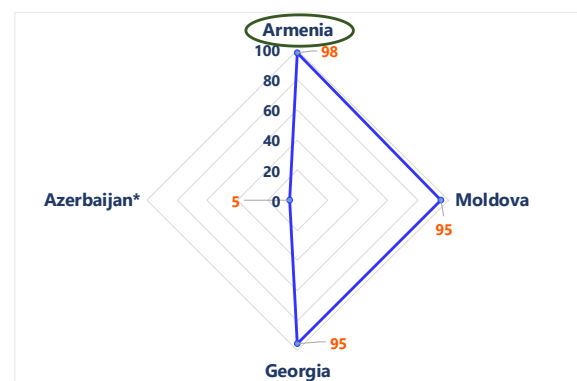
Without a high-quality GIS (Geographic Information System) software it is not possible to have a high-quality road safety or crash database. Spatial analysis is widely used in the field of road safety, especially when visualising crash and other road safety data on a map.

Road safety database best practise involves the connection of alphanumerical/relational (e.g., Oracle, SQL) and GIS databases.



Web orientation of software platform

It is important that the software platform be accessible online to enable wider data access and data exchange between different institutions and/or organizations. This is especially important for the public use of crash and other road safety data. A road safety database should be connected with other databases or datasets established by different institutions and organizations – e.g., crash databases and road databases.

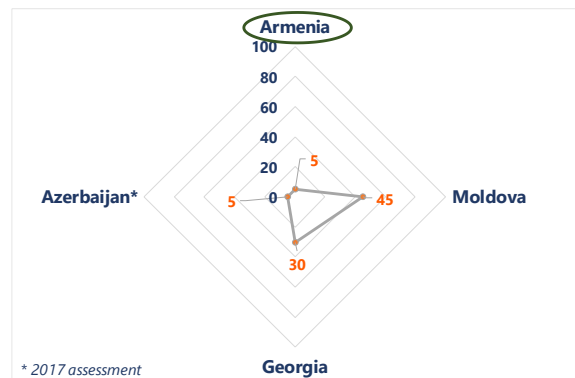


Through a web-oriented database platform, data can be accessed from anywhere.



Database availability

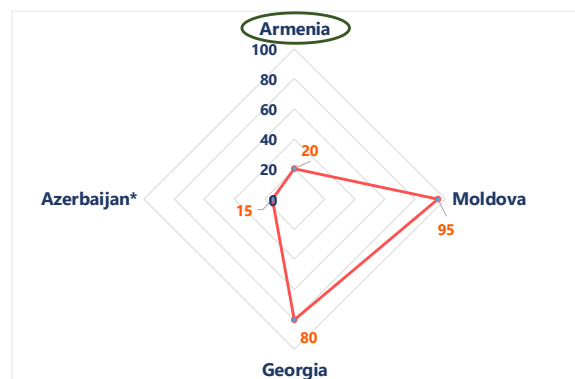
The principle of “open by default” means that the government data should be made open and available for the public to find, access, and use under an open and unrestrictive license; the exception being a specific reason why the data cannot be made open, and that reason is clearly communicated to the public. The open data principle is most promoted by developing countries.



The online availability of a road safety database is a key indicator that a country understands the importance of making road safety data available to a wide range of users. It is a sign that the country recognizes the need to involve other road safety stakeholders in the road safety system.

Updating the database

If a country has established an open or half-restricted crash or road safety database, then the updating of crash and other data should be undertaken regularly, on an annual (early February/March for the previous year) or semi-annual basis (early August for the first half of the current year). The age of data gives an indication as to whether this is happening.

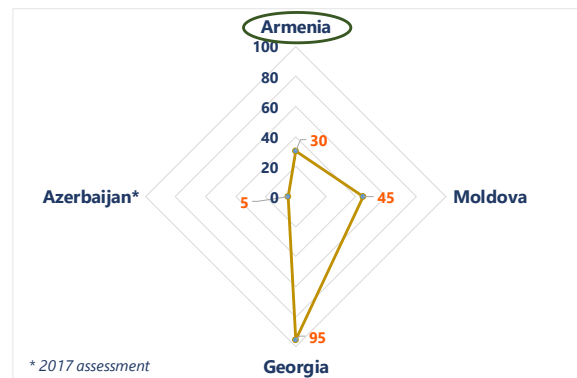


A precondition for having a regularly updated database is the establishment of such a database.



Willingness to exchange data

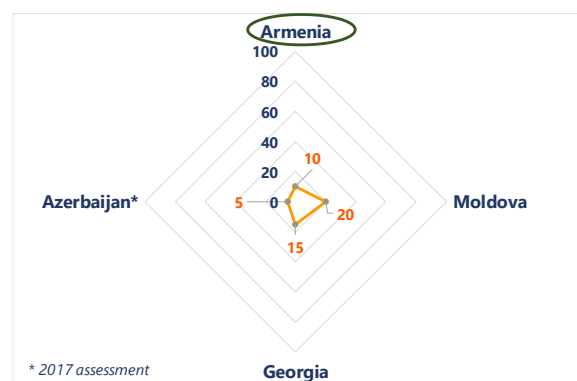
The existence of a will to publish road safety data (including crash data) is a necessary precondition for the development of a high-quality crash database system. A lack of will at the level of the Ministry of Interior or Patrol (Traffic) Police to make crash data available to all other stakeholders could constitute an obstacle to this. The data should be available to everyone on the same basis.



In most cases the availability of road crash and other road safety data depends on the government. The exchange of data between institutions/organizations involved in road safety is important for the establishment of a sound crash data system. A lack of data sharing typically means that there is no high-quality road safety system in the country—a constraint to the monitoring and improvement of road safety.

Connectivity

Connectivity between different sets of data is extremely important for a high-quality road safety database. If a road safety database contains crash data, data about roads and road safety characteristics (usually called a state road reference system), these separate databases or datasets should be connected.



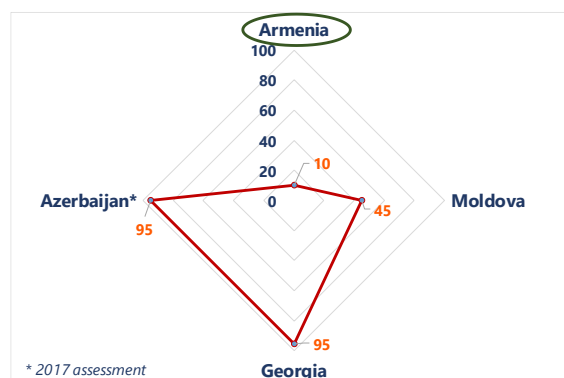
Best practice in the field of road safety involves connecting road safety-relevant datasets collected by different organisations (crash data, registered motor vehicles, population, data about roads, Safety Performance Indicators, social attitudes, etc.).



Road safety database concept

The most commonly used tool for road safety management and road safety monitoring is a road safety database combined with the appropriate software. Without this tool, it is practically impossible to undertake high-quality road safety work.

A road safety database should contain different datasets supplementing each other and should ultimately allow for them to be linked. This would allow for advanced analyses and road safety research (crash data, data about roads, road safety characteristics, Safety Performance Indicators, problem identification, black spots, most dangerous sections, risk mapping, etc.)



A widespread understanding of the road safety database concept together with the reference to a road safety database in legislation is typically an indicator that the concept is well-established in a country.

4.2 Benchmarking of crash database systems - Results

Armenia performs well in the three benchmarking criteria, i.e., Web orientation, Software Platform and Institution. More specifically, the Road Police, under the Ministry of Internal Affairs, is the institution responsible for establishment, maintenance and update of the road crash database. A digital road crash database was established in 2019, and the crash data collection form was also modified. The digital road crash database will provide syncing with maps; however, the work has not been completed yet and GIS features are expected to be integrated in 2023.

A poor performance is observed regarding the remaining criteria, except legislation. The online platform of the crash database is accessible only to the authorised Police officials for internal use. However, opening access to key road safety data to other stakeholders is currently under implementation. The systematic exchange of road safety and crash data does not take place in Armenia. An official request is required to access aggregated road crash data, while disaggregated crash data are not allowed to be shared with third parties.

Also, Armenia does not have a central road safety database that includes other important databases or datasets; however, attempts to link the crash database with road and driver registries have been made recently. Finally, a road crash fatality is defined as a death that takes place within a period of up to 30 days after a road crash.



Figure 5. Evolution of Benchmarking of crash database system, 2017 (left), 2022 (right)



5. Comparison of Road Crash Data Structure and CADaS

The CADaS document proposes a minimum set of standardized data on crashes. This is to be collected in the Member States of the European Union to allow for the comparison of data on crashes between countries in Europe. Recording data in line with the European Commission’s CADaS recommendation will enable production of more detailed and reliable analyses of road safety, planning of measures for improving road safety, evaluation of the efficiency of implemented measures, and the exchange of experience among countries which apply the CADaS protocol.

Variables that have been proposed in the CADaS recommendation of the European Commission are organized into four groups:

1. Crash-related data (A),
2. Road-related data (R),
3. Data on vehicles involved in crashes (V),
4. Person-related data (P).

Table 1. Legend with the meaning of symbols +++, + and -

+++	The variable is recorded in Armenia’s Crash Form in a way that is in-keeping with the European Commission’s CADaS recommendation, or minimal adjustments are needed to meet these recommendations.
+	The variable is not recorded as a separate variable in Armenia’s Crash Form, as outlined in the European Commission’s CADaS recommendation, but the data is collected within other variables. A modification of these variables is necessary in order to meet the European Commission’s CADaS recommendation.
-	The variable is not recorded in Armenia’s Crash Form.

The crash data collection structure used in Armenia was compared with the CADaS data structure in 2021, and the results are shown in Figure 6. Also, based on the assessment of this year, 17 out of 28 mini-CADaS variables are included in Armenia’s crash database. No changes have been made since 2021.

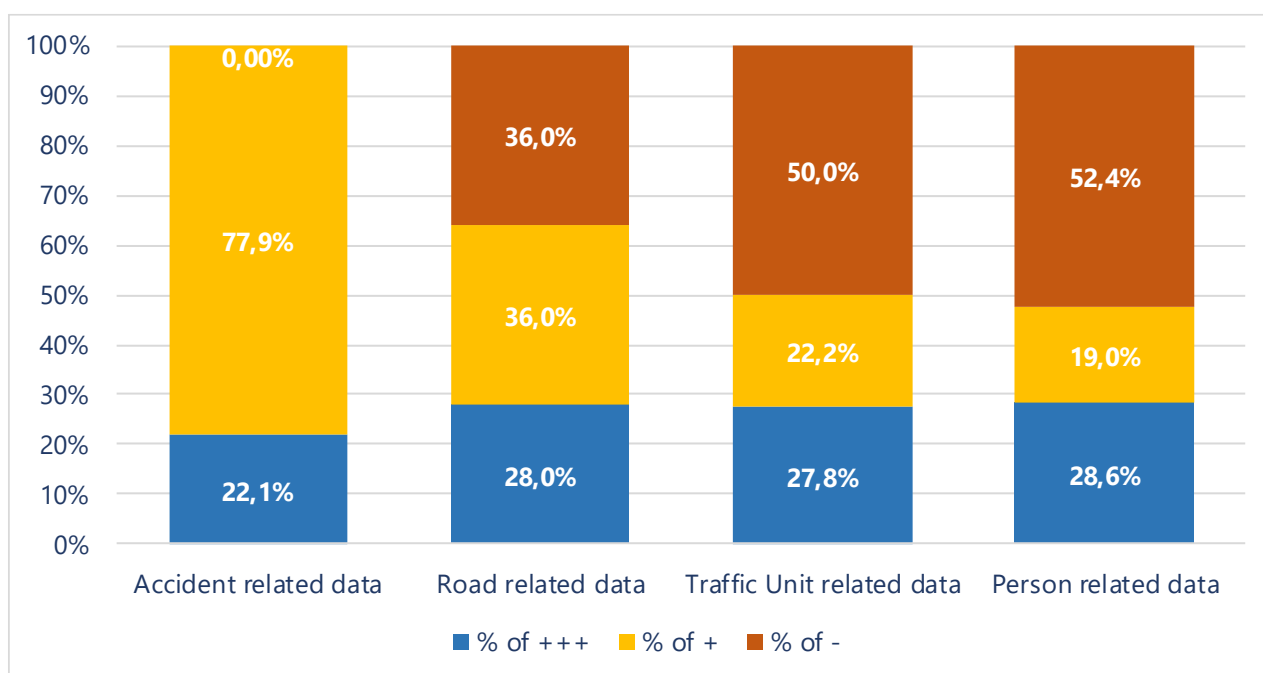


Figure 6. Results of comparison – CADaS data structure/Crash data form of Armenia

Armenia has made significant progress in the national crash data structure and variables to make it more compatible with the EC recommended CADaS protocol. The first group of Armenian crash variables, i.e., the crash related variables, has the highest compatibility with those of the CADaS system, in comparison to the other groups of variables. The data related to the traffic unit and person involved in a crash require further changes; though about 28% of the variables included in the Armenia's crash data collection form keep the EC CADaS recommendation, compared to about 5% up to 2018. However, about half of the traffic unit and person related variables suggested by CADaS are not recorded. In terms of road-related variables, 28% of CADaS recommended variables are included in the Armenian crash dataset, compared to 16% of variables registered in 2018.

Indicatively, in the second group of variables the missing road-related variables are those that concern the functional classification of the second road, speed limits on roads, information on motorways and highways, relation junction, number of lanes, existence of emergency lanes, road signs, etc. In the third group of variables, those related to traffic unit, the gaps between the variables of Armenian crash data collection form and the CADaS structure are mostly related to engine power and active safety equipment of the vehicle, model, registration date and country of registration, first point impact, etc. Regarding the fourth group of variables proposed by CADaS, i.e., person-related data, variables concerning alcohol or drug test and related results, driver's nationality, seating position, trip purpose, etc. are not currently included in the Armenian dataset. The most significant variable missing, however, concerns the injury severity and the non-use of international standards (e.g., MAIS scale) for the classification of the injuries.



6. Comparative assessment of the EaP countries

This section presents the results of the comparative assessment of the crash database systems of the EaP countries for 2022 (2017 assessment results for Azerbaijan), based on the 10 benchmarking criteria.

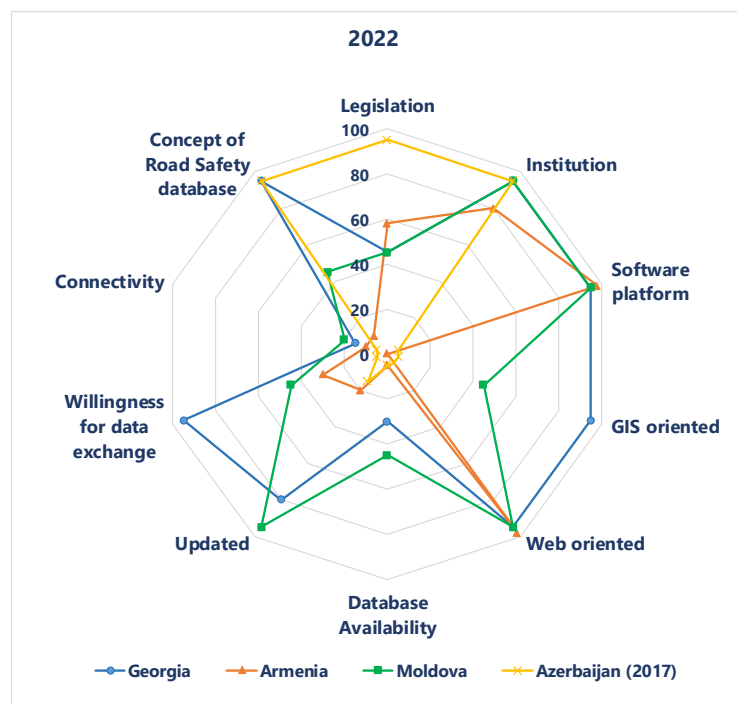


Figure 7. Benchmarking of crash database systems of EaP countries, 2022

The main conclusions from the cross-country comparison are summarized below:

- The concept of a crash/road safety database is not clearly referenced in the legislation of any country, except Azerbaijan.
- In most countries there is one institution tasked with leading the establishment and development of a road safety database.
- Armenia, Moldova, and Georgia have software platforms that allow updating the data structure in a simple manner and facilitate data input and exporting.
- All countries have developed crash databases that are available online, which may enable the data exchange between different institutions and organizations.
- The new electronic module of Georgia possesses GIS features, while in Moldova there is the option to use point locations.
- The principle of an “open by default” road safety database has not been adopted by any country, while in Georgia and Moldova progress has been made towards providing access to detailed crash data to other authorities in the future.



- In Moldova and Georgia updates of crash data are undertaken regularly, on an annual or semi-annual basis.
- The new platform for road crashes aims to provide accessibility to the collected crash data to all responsible agencies working on road safety issues.
- Other available road safety databases at national level are not connected with the crash database in any country.

One of the main tasks towards the establishment of the EaP road safety observatory is the harmonization of the crash data of the EaP countries based on the CADaS standards. It was agreed that as an intermediate measure the minimum common set of crash variables would include the 28 mini-CADaS variables. Table 2 shows the number of mini-CADaS variables included in the national crash databases for Armenia, Azerbaijan, Georgia, and Moldova, indicating the progress that has been made so far.

Table 2. Number of mini- CADaS variables collected in EaP countries.

Country	Mini-CADaS variables
Armenia	17 out of 28
Azerbaijan	19 out of 28
Georgia	24 out of 28
Moldova	16 out of 28



7. Key Conclusions & Recommendations

In 2021 Armenia recorded 12.4 fatalities per 100,000 inhabitants, which is the highest among the EaP countries, while also being the only country that recorded an increase in road fatalities during 2012-2021.

Armenia is in progress of improving its national crash data system in the context of the establishment of the Eastern Partnership (EaP) Road Safety Observatory, as well as a member of the Asia-Pacific Road Safety Observatory (APRSO). Armenia has made significant progress in modifying its national crash data structure, which currently is more compatible with the CADaS protocol compared to the previous assessment in 2017.

A digital road crash database was established in 2019, which will also provide syncing with maps. At this stage GIS features are not available but are expected to be integrated next year. External support for the technical operation and further improvement of the digital database server is needed.

Further work is needed regarding the open sharing of anonymized crash data. On-going projects are working on widening the access to other authorities (e.g., ministries); however, an official request is still needed in order to obtain aggregate crash data, which also seems to be the case for providing data to the EaP road safety observatory.

To accelerate the process in this direction, it is necessary to convince the authorities responsible for collecting crash data and maintaining the crash database of the benefits of a central road safety database that will provide crash data to other stakeholders related to road safety. More specifically, the benefits of linking different databases and using crash data for the improvement of road safety (e.g., identification of black spots or high-risk road user groups) should be highlighted, especially to Traffic Police, through examples of other countries that apply the CADaS protocol and make such use of the crash data.

The following actions are proposed to enhance the data collection system of Armenia and to properly prepare it in the process of the establishing the EaP road safety observatory:

Action Area 1: Harmonization of crash data among the EaP countries

- A significant step to be prioritized for Armenia is the gradual inclusion/modification of further variables in the national crash database based on the CADaS protocol.
- The first target is formulated as the inclusion of the 28 Mini-CADaS variables in the national crash dataset, which will be further gradually expanded with more CADaS variables.
- To achieve that, Armenia's crash data collection form needs to be updated, and police officers should be trained in order to properly collect the requested data.



Action Area 2: Data quality control

- A standardized data collection form (ideally in electronic format), along with proper training in its use, can simplify the transfer of data from the data collection form to the crash database.
- The collection of accurate location information of the crash is recommended through a mobile Global Positioning System (GPS) device at the crash scene.
- Quality assurance measures should be taken regarding data collection and data entry procedures, such as double-checking of a sample of the electronic records and the original data sources (police reports), cross-checking injury severity using police and hospital data, etc.

Action Area 3: Harmonization of injury data

- The European Commission strongly recommends collecting MAIS3+ data in support of its objective to harmonize data collection on serious injuries across European countries, which also depends on the good quality of police and hospital data and the linking of these databases.
- As with the Police data, clear guidelines are required for the collection and coding of variables to be included in hospital data.
- Identifiers that allow matching of hospital and police data per crash and injured person should be introduced, so that the information from both the on-scene traffic police report and the detailed injury hospital report is combined.

Action Area 4: Under-reporting

- The establishment of a valid death registration system should be considered for Armenia, in order to better validate the crash data collected by the Police and estimate the effect of under-reporting in the national road crash statistics.
- Linking the police and hospital datafiles is considered the best option for the systematic exchange and validation of collected data from the two authorities mainly involved.

Action Area 5: Establishment of a national road safety database

- Legislation amendments are needed for the establishment of a multi-sectoral road safety database at the national level.
- Data from the existing vehicle driver licence and road datafiles (in either aggregate or disaggregate form) can be included in the national road safety database and be linked to the crash data at a later stage.
- Data on road safety performance (speeding, use of protective systems, driver distraction, driving under the influence) can be collected in the future and be included in the road safety database.
- The context within disaggregate crash data will be shared with other Ministries and road safety stakeholders, protecting in parallel any sensitive or personal information as to be defined in the national legislation.



All the above actions will be further promoted and strengthened with the participation of the Republic of Armenia in the EaP Road Safety Observatory, which will not only analyse the national data provided by the EaP countries but will also provide further expertise in collecting data in a harmonized way following data quality control and validation procedures.



Appendix A

Country Abbreviations

Abbreviation	Country	Abbreviation	Country
AT	Austria	LU	Luxembourg
BE	Belgium	LV	Latvia
BG	Bulgaria	MT	Malta
CY	Cyprus	NL	Netherlands
CZ	Czech Republic	PL	Poland
DE	Germany	PT	Portugal
DK	Denmark	RO	Romania
EE	Estonia	SE	Sweden
EL	Greece	SI	Slovenia
ES	Spain	SK	Slovakia
FI	Finland	AM	Republic of Armenia
FR	France	AZ	Republic of Azerbaijan
HR	Croatia	GE	Georgia
HU	Hungary	MD	Republic of Moldova
IE	Ireland	UA	Ukraine
IT	Italy	EaP	Eastern Partnership
LT	Lithuania	EU	European Union