



Interreg



Danube Transnational Programme RADAR

Project co-funded by European Union funds (ERDF, IPA, ENI)



**Your Road Safety is on our
RADAR.**

RADAR Status Report

**ANALYSIS OF AVAILABLE ROAD SAFETY DATA,
KNOWLEDGE AND PRACTICES IN THE PP AND ASP
COUNTRIES.**



RADAR – Risk Assessment on Danube Area Roads



<https://www.interreg-danube.eu/radar>

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Abbreviation list

RADAR	Risk Assessment on Danube Area Roads
TA	Thematic Area
DTP	Danube Transnational Programme
PP	Project Partner
ASP	Associated Strategic Partner
EUSDR PA 1b	European Union Strategy for Danube Region Priority Area 1b
SEETO	South East European Transport Observatory
RSIA	Road Safety Impact Assessment
NWRSA	Network-wide Road Safety Assessment
RSI	Road Safety Inspection
RSA	Road Safety Audit
AADT	Annual Average Daily Traffic
VRU	Vulnerable Road User
GDP	Gross Domestic Product
RAP	Road Assessment Programme
IFI	International Financial Institution

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1. Introduction

Large parts of the Danube road network rate poorly for safety, particularly for vulnerable road users, and death rates in many countries are higher than the EU average. Many countries lack professional capacity and approaches to the problem vary.

RADAR (Risk Assessment on Danube Area Roads) implements learning and transnational cooperation activities at different levels to help the responsible road safety organisations in the Danube area identify risk on their road networks reduce that risk systematically, by improving infrastructure and road layout. RADAR addresses all road-users but pays particular attention to (TA2) vulnerable road users and safety on major roads near schools (TA4). It also approaches the issue of safety in a holistic way (TA1) and tackles speed (TA3) as a major risk on roads.

The project contributes to Specific Objective 3.1 of the DTP Programme, in line with the restricted topic on transport safety as outlined in the 2nd Call for Proposals.

The project includes work in 11 Danube countries, has 10 PPs, joined by 11 ASPs (mainly ministries or road authorities) in most countries, as well as the EUSDR PA1B and SEETO. Training courses and study visits for professionals of road safety organisations guide participants PPs through the steps from analysing safety on their road network to defining road safety solutions that are cost effective and lead to the highest reductions in road crashes and casualties. The establishment of a transnational Road Safety Expert Group increases knowledge across the region and draws on input from beyond its borders towards a first region-wide “Danube Infrastructure Road Safety Improvement Strategy” and national Action Plans defining clear steps for implementation of its goals. Finally, Pilot Actions (8) show authorities steps to be taken to prioritise road sections. Implementation-ready Road Layout Concept Plans show what needs to be done at selected locations prior to crash countermeasure implementation.

The overall purpose of the project is to save lives and serious injury on the roads of the Danube region by providing a shared strategy and plans to guide road infrastructure safety investment in the Danube countries.

Added value/objective of the Report

Collecting road safety data from participating countries, or project partners, such as general data (including the number of population, geographic area, nominal GDP, etc.), data concerning national road safety strategies, infrastructure safety management, as well as infrastructure facilities for vulnerable road users has been an objective of the RADAR Status Report. Each data set consists of even more detailed information, including, for example, road network length, road network density, crash data and speed limits (general data), or national fatality targets, road safety policies, budgets, stakeholders, etc. (national road safety strategies). The data set on infrastructure safety management concerns, for example, the implementation of the Infrastructure Safety Directive (2008/96/EC), applied standards for road infrastructure, identification of high risk roads, AADT data, priorities for assessing sections or roads to be improved, etc., while the section on infrastructure facilities for VRUs offers the overview of presence of basic infrastructure intended for pedestrians, cyclists and motorcyclists.

A comparative analysis based on collected data has been made to support the objectives of this report, i.e. to help understand and implement the training curriculum tailored for the target audience and each participating country. The analysis shows the road safety situation in the countries concerned, for the data sets included in the report, for the recent period (2017 or 2018). Presentation of collected data is given in the form of charts and tables, followed by a short explanation of details concerned.

Therefore, the Status Report is of significance not only for the specific project output, i.e. 3.1 Road Safety Procedures Training Concept, but also for the specific RADAR objectives. It will contribute to identifying and reducing risk on the Danube road network, enhancing transnational cooperation of relevant stakeholders and road authorities in charge of national road networks, as well as to helping build capacities of PPs, ASPs and road safety engineers and professionals. Finally, it will also contribute to making the Danube Infrastructure Road Safety Improvement Strategy and Action Plan to be used by participating countries from the Danube area in order to improve safety on their roads.

2. Country Reports

2.1. Slovenia

2.1.1. General data

Slovenia is a sovereign state located in southern Central Europe mostly in the Julian Alps. It is bordered by Italy to the west, Austria to the north, Hungary to the northeast, Croatia to the southeast, and the Adriatic Sea to the southwest. Slovenia covers 20,273 square kilometres of which 20,151 square kilometres are land and 122 square kilometres are water. Slovenia has 2,102,126 inhabitants (July 2018 est.). Slovenia has a mostly mountainous terrain with a mainly continental climate. The capital of Slovenia is Ljubljana. Nominal GDP in 2018 was 42.81 billion EUR, with a nominal per capita GDP of 30,223 EUR.¹

2.1.1.1 Road network

Length of primary network: 1.424 km (motorways and expressways: 617 km).

Length of secondary network: 5.129 km

Length of tertiary network: 32.246 km

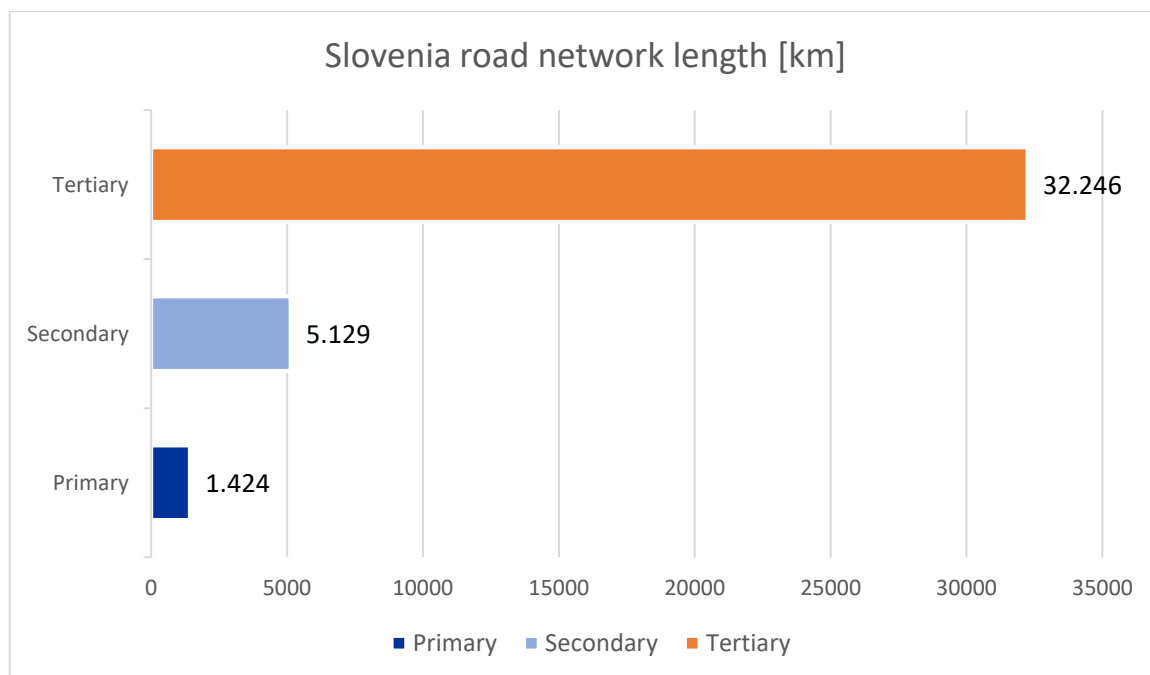


Figure 1 Road network in Slovenia

Figure 1. shows the ratios of primary, secondary and tertiary roads in Slovenia (2018). The most common roads in Slovenia are tertiary roads with 32.246 km, followed by secondary roads with 5.129 km and primary roads with 1.424 km.

¹ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/si.html>

2.1.1.2 Crash data

Crash data of Slovenia (2017)	
Number of fatalities	104
Vehicle occupant fatalities	53
Cyclist fatalities	11
Pedestrian fatalities	10
Motorcycle fatalities	29
Number of injuries	7,901
Fatalities / Mio. population	50.3

Table 1 Crash data of Slovenia

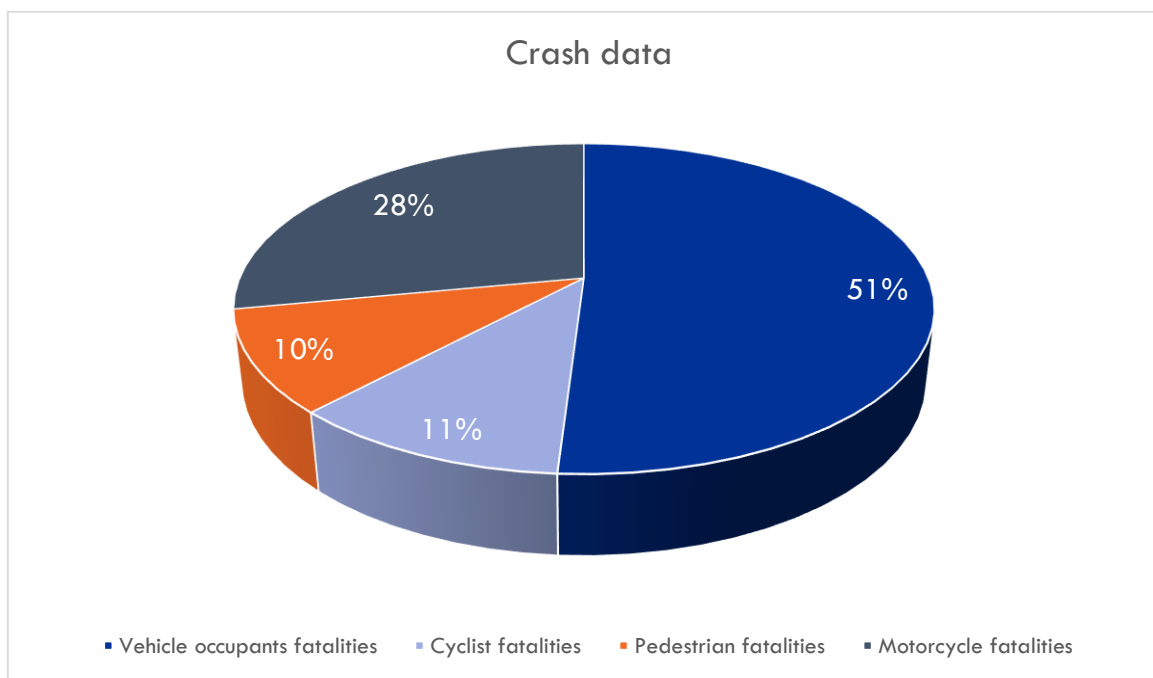


Figure 2 Crash data of Slovenia

Figure 2. shows the ratio of various types of accidents in Slovenia. Most common are vehicle occupant fatalities (53), followed by motorcycle fatalities (29), cyclist fatalities (11) and pedestrian fatalities (10).

2.1.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 110 km/h.

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h.

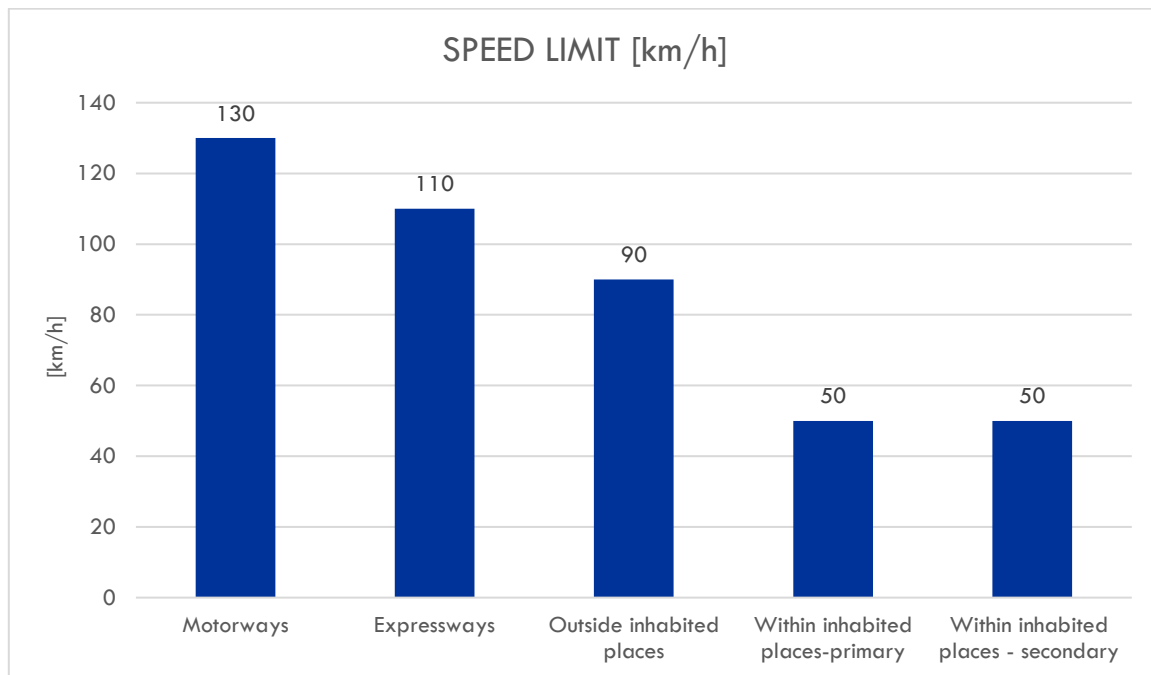


Figure 3 Speed limits in Slovenia

Figure 3. shows speed limits in Slovenia.

2.1.2. National Road Safety Strategy

Slovenia has a national road safety strategy in operation (2013-2022).

2.1.2.1 Targets

The number of fatalities should not exceed 35 per million inhabitants, and the number of severely injured should not exceed 230 per million inhabitants on Slovenian roads by the end of 2022.²

² https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/npvcv_2013_g2805_web_en.pdf

2.1.2.2 Policy

Within Policy principles, goals to be followed, are:

- Community support of goals
- Feasibility
- Flexibility,
- Suitability
- Timely,
- Consistency, (internationally, nationally, local),
- Optimality,
- Responsibility,
- Systematic,
- Measurability.

2.1.2.3 Road safety budget

In Slovenia, the national Road Safety Agency has a dedicated road safety budget, to follow National Road Safety Strategy goals. On the other hand, ministries, municipalities and road authorities have integral budgets, having road safety money indirectly within funding projects, road management and other activities.

2.1.2.4 Road safety funds

There is a fund for National Road Safety Agency (1,900,000 EUR for all kinds of activities).

2.1.2.5 Evaluations

Indirect, through road safety data and dedicated studies.

2.1.2.6 Road Safety Agency and road safety departments with authorities

There is Road Safety Agency and road safety departments within Ministry and road authority in Slovenia.

2.1.3. Infrastructure Safety Management

2.1.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Slovenia has fully implemented the European Infrastructure Safety Directive. This goes for all mechanisms mentioned in the Directive: RSIA, NWRSA, RSI, RSA.

2.1.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Slovenia	
Primary-motorways	National
Primary-other	National
Secondary	National
Tertiary	Local municipalities

Table 2 Competences per road categories of Slovenia

2.1.3.3 Priorities for assessing sections or roads for improvement

Looking at the whole network and trying to improve the standard of it all.

2.1.3.4 Identification of high-risk sites

Slovenia has their own methodology for evaluation of locations with high level of road accidents.

2.1.3.5 In-depth crash analysis

There are licensed auditors of fatal accidents. Slovenia use a digital road maps for mapping crashes.

14

2.1.3.6 Data availability: Speed levels

Data for primary and secondary network are available.

2.1.3.7 Use of digital crash maps and road databases

Slovenia uses detailed road databases and digital crash maps for mapping crashes.

2.1.3.8 Data availability: AADT

Data for primary and secondary network are available.

2.1.3.9 EuroRAP/iRAP Star Rating methodology

Slovenia has data for about 4,200 km of state roads that have been collected using EuroRAP/iRAP Star Rating methodology.

EuroRAP procedures are integrated in the National Road Safety Plan 2013-2022, within the chapter "Safer roads design, construction and assessment".

2.1.4. Facilities for VRUs

2.1.4.1 Pedestrians and cyclists

There is infrastructure for the safe movement of pedestrians and cyclists.

2.1.4.2 Motorcyclists

There is no specific infrastructure for the safe movement of motorcyclists.

2.2.1.2 Crash data

Crash data of Croatia (2017)	
Number of fatalities	331
Vehicle occupant fatalities	202
Cyclist fatalities	23
Pedestrian fatalities	56
Motorcycle fatalities	50
Number of injuries	14,608
Fatalities / Mio. population	80.6

Table 3 Crash data of Croatia

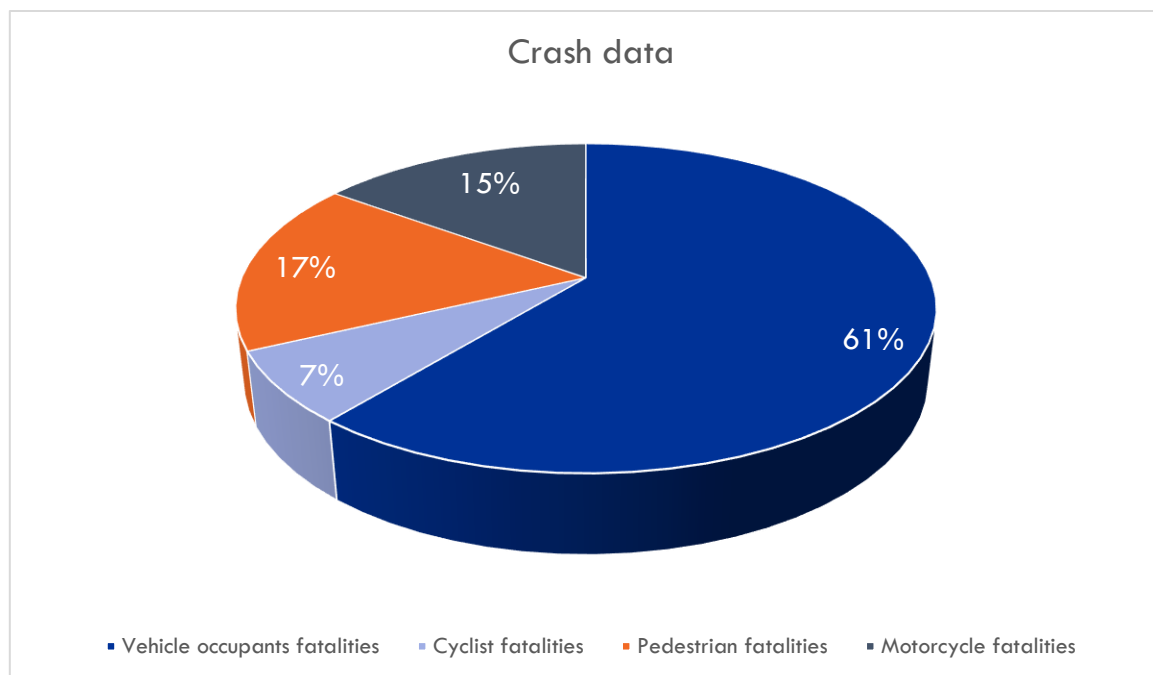


Figure 5 Crash data of Croatia

Figure 5. shows the ratio of various types of accidents in Croatia. Most common are vehicle occupant fatalities (202), followed by pedestrian fatalities (56), motorcycle fatalities (50) and cyclist fatalities (23).

2.2.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 110 km/h.

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h.

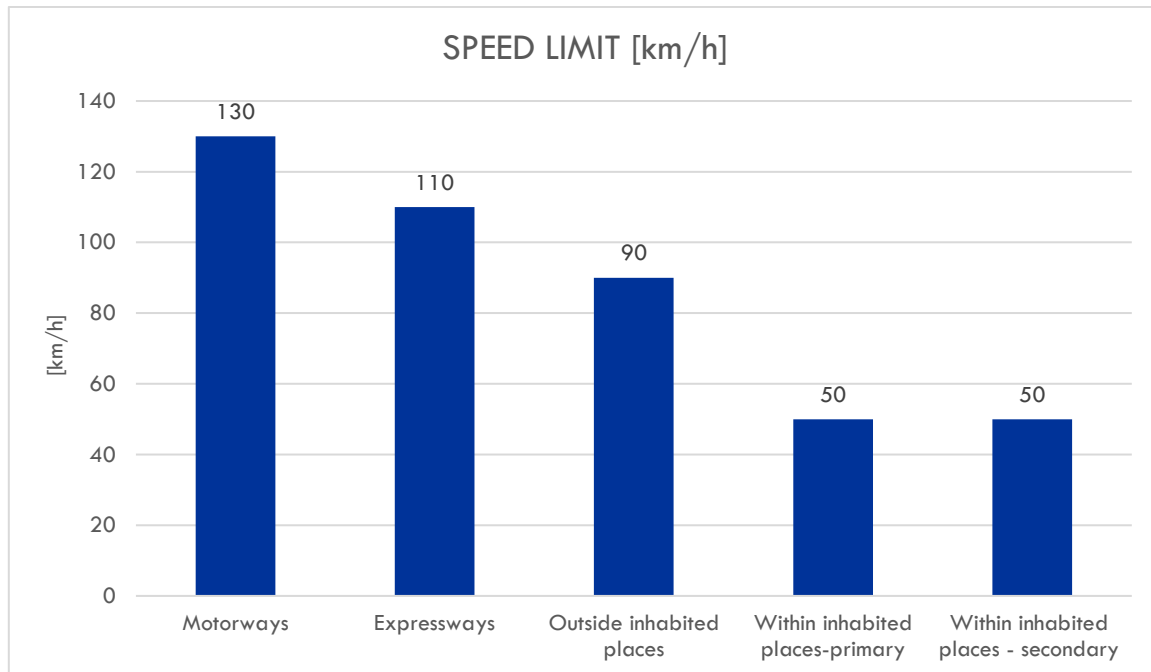


Figure 6 Speed limits in Croatia

Figure 6. shows speed limits in Croatia.

2.2.2. National Road Safety Strategy

Croatia has a national road safety strategy in operation (2011-2020).

2.2.2.1 Targets

Main goal is 50% decrease in the number of fatalities till 2020, in comparison to the year 2010.⁴

2.2.2.2 Policy

1. Striving for the highest road safety standards.
2. Integrated approach to road safety
3. Subsidiarity, proportionality and shared responsibility.

⁴ https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/20151210_2_cro_nrsp_2011-2020.pdf

2.2.2.3 Road safety budget

In Croatia there is budget for road national strategy.

2.2.2.4 Road safety funds

There are dedicated road safety funds on national level (5,000,000 – 7,000,000 Eur).

2.2.2.5 Evaluations

An estimate of the efficiency of the invested funds is made.

2.2.2.6 Road Safety Agency and road safety departments with authorities

There is no Road Safety Agency in Croatia, but there are road safety departments within Ministry, Road Authority and Local Authorities.

2.2.3. Infrastructure Safety Management

2.2.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Croatia has fully implemented the European Infrastructure Safety Directive. This goes for all mechanisms mentioned in the Directive: RSIA, NWRSA, RSI, RSA.

2.2.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Croatia	
Primary-motorways	National
Primary-other	National
Secondary	Local
Tertiary	Local municipalities

Table 4 Competences per road categories of Croatia

2.2.3.3 Priorities for assessing sections or roads for improvement

Looking at the whole network and trying to improve the standard of it all.

2.2.3.4 Identification of high-risk sites

For identifying high risk sites Croatia uses iRAP/EuroRAP methodology and NWRSA guidelines.

2.2.3.5 In-depth crash analysis

Black spot management.

The Black spots are determined according to the *Methodology for identification of dangerous spots on the road network*, based on the critical threshold rate of traffic accidents which is

calculated based on the average traffic accident rate on the observed road network calibrated by corresponding value of statistical significance coefficient. The in-depth investigation is not performed for all determined black spots, but only for selected critical statistical sample of the most dangerous black spots identified on the road network.

2.2.3.6 Data availability: Speed levels

Operating speed data are not available.

2.2.3.7 Data availability: AADT

Data for motorways and expressways are available.

2.2.3.8 Use of digital crash maps and road databases

Croatia uses a detailed road database and digital crash maps for mapping crashes.

2.2.3.9 EuroRAP/iRAP Star Rating methodology

Croatia has data for about 3,851 km that have been collected using EuroRAP/iRAP Star Rating methodology.

2.2.4. Facilities for VRUs

2.2.4.1 Pedestrians and cyclists

There is infrastructure for the safe movement of pedestrians. Infrastructure for safe movement of cyclists is not present.

2.2.4.2 Motorcyclists

There is no specific infrastructure for the safe movement of motorcyclists.

2.3. Hungary

2.3.1. General data

Hungary is a country in Central Europe. Other countries that border Hungary are Austria, Slovakia, Ukraine, Romania, Serbia, Croatia and Slovenia. Hungary's official language is the Hungarian language. The capital of Hungary is Budapest. Hungary covers 93,028 square kilometres of which 89,608 square kilometres are land and 3,420 square kilometres are water. Hungary has 9,825,704 inhabitants (July 2018 est.). Nominal GDP in 2018 was 121.92 billion EUR, with a nominal per capita GDP of 25,925 EUR.⁵

2.3.1.1 Road network

Length of primary network:	motorways 1.173 km. motor roads 300 km.
Length of secondary network:	State primary main roads 2.165 km. State secondary main roads 4.815 km.
Length of tertiary network:	State other roads 23.089 km.

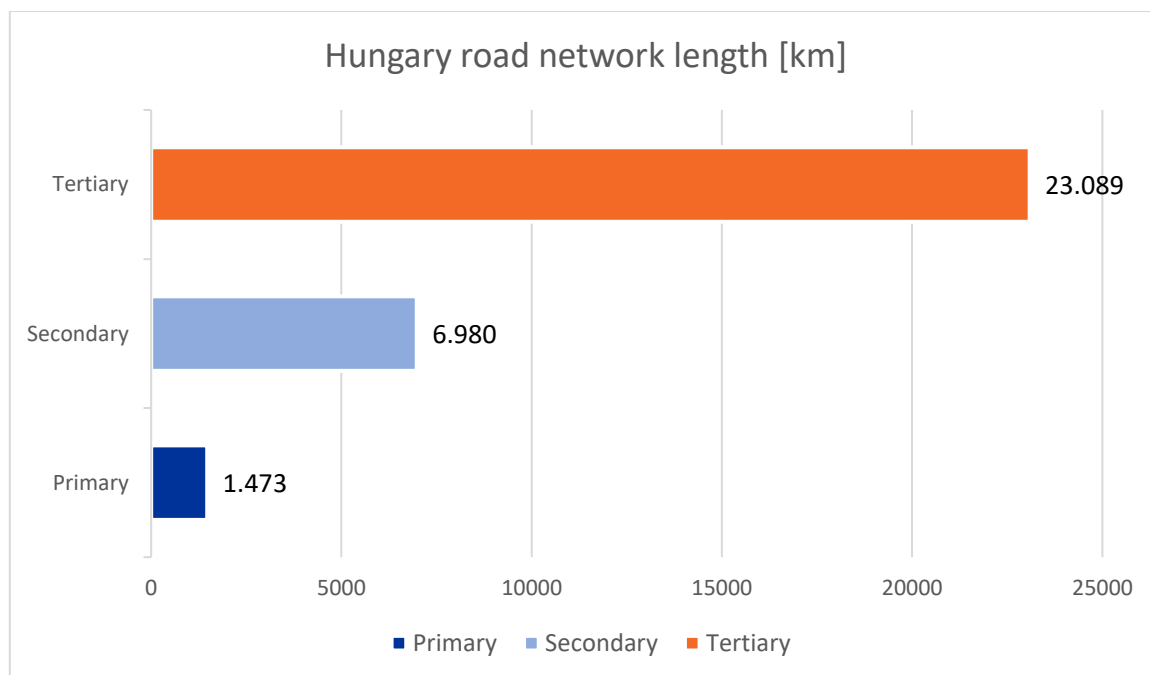


Figure 7 Road networks length in Hungary

Figure 7. shows the ratios of primary, secondary and tertiary roads in Hungary (2017). As can be seen, the most common roads in Hungary are tertiary roads with 23.089 km, followed by secondary roads with 6.980 km and primary with 1.473 km.

⁵ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/hu.html>

2.3.1.2 Crash data

Crash data of Hungary (2015)	
Number of fatalities	644
Vehicle occupant fatalities	304
Cyclist fatalities	83
Pedestrian fatalities	149
Motorcycle fatalities	50
Number of injuries	20,899
Fatalities / Mio. population	65.9

Table 5 Crash data of Hungary

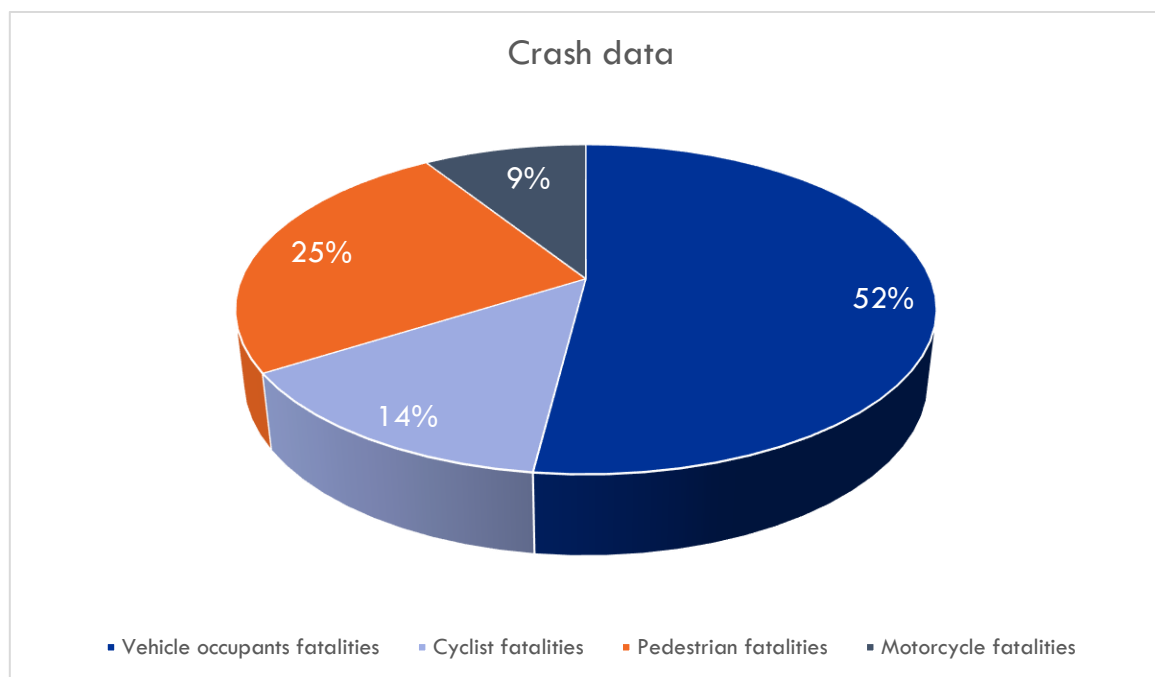


Figure 8 Crash data of Hungary

Figure 8. shows the ratio of various types of accidents in Hungary. Most common are vehicle occupant fatalities (304), followed by pedestrian fatalities (149), cyclist fatalities (83) and motorcycle fatalities (50).

2.3.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 110 km/h.

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h (At given locations (e.g. in vicinity of schools): 30 km/h; 40 km/h)

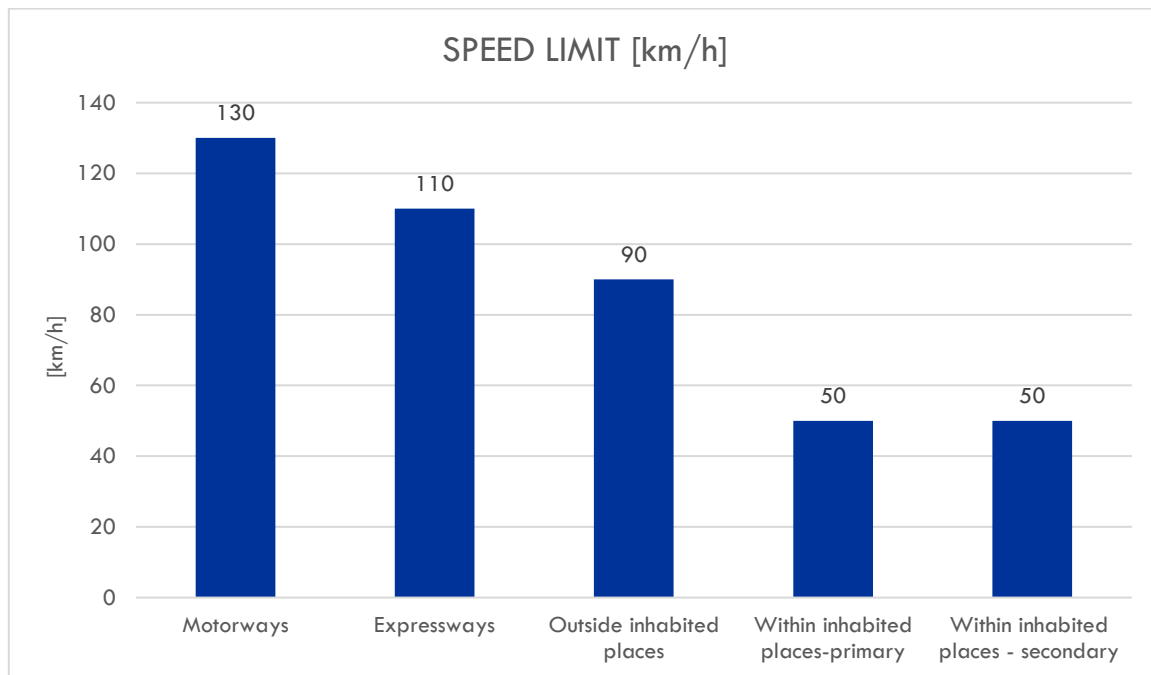


Figure 9 Speed limits in Hungary

Figure 9. shows speed limits in Hungary.

2.3.2. National Road Safety Strategy

There is no National Road Safety Strategy and Action Plan in Hungary.

The first Road Safety Programme was elaborated in Hungary in 1992. In recent years 3-year Road Safety Action Programmes were developed. The last programme was valid for the period 2014-2016, but the importance and weight of the programmes have continuously decreased.

2.3.2.1 Targets

EU targets are applied which are 50% reduction in fatally injured and severely injured people by 2020.

2.3.2.2 Road safety budget

In Hungary there is budget for Road Safety.

2.3.2.3 Road safety funds

There is dedicated road safety fund on national level, and it is some percentage of technical vehicle inspection.

2.3.2.4 Road Safety Agency and road safety departments with authorities

There is no Road Safety Agency in Hungary or road safety departments within Ministry and road authority.

2.3.3. Infrastructure Safety Management

2.3.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Hungary has fully implemented the European Infrastructure Safety Directive. This goes for all mechanisms mentioned in the Directive: RSIA, NWRSA, RSI, RSA.

2.3.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Hungary	
Primary-motorways	National
Primary-other	National
Secondary	National
Tertiary (municipal roads)	Local municipalities

Table 6 Competences per road categories of Hungary

2.3.3.3 Priorities for assessing sections or roads for improvement

Assessing of hot spots, crash clusters or black spots.

2.3.3.4 Identification of high-risk sites

Black spot analysis based on a research by MAÚT (2005). A new methodology is currently being developed (related to Government Decree 176/2011 (VIII.31)).

2.3.3.5 In-depth crash analysis

There is currently no in-depth crash analysis.

2.3.3.6 Data availability: Speed levels

Operating speed data are available for all roads except for municipal roads.

2.3.3.7 Data availability: AADT

Data for all roads are available except for municipal roads.

2.3.3.8 Use of digital crash maps and road databases

Hungary uses detailed road databases and a digital crash maps for mapping crashes.

2.3.3.9 EuroRAP/iRAP Star Rating methodology

Hungary has data for about 2,913 km that have been collected using EuroRAP/iRAP Star Rating methodology

2.3.4. Facilities for VRUs

2.3.4.1 Pedestrians and cyclists

There is infrastructure for the safe movement of pedestrians and cyclists on state and municipal roads.

2.3.4.2 Motorcyclists

There is no specific infrastructure for the safe movement of motorcyclists. In some of the roads there are safe infrastructure elements.

2.4. Czech Republic

2.4.1. General data

The Czech Republic is a landlocked country in Central Europe bordered by Germany to the west, Austria to the south, Slovakia to the east and Poland to the northeast. The capital of the Czech Republic is Prague. The Czech Republic covers 78,867 square kilometres of which 77,247 square kilometres are land and 1,620 square kilometres are water. The Czech Republic has 10,686,269 inhabitants (July 2018 est.). Nominal GDP in 2018 was 188.7 billion EUR, with a nominal per capita GDP of 31,035 EUR.⁶

2.4.1.1 Road network

Length of primary network: 7.065 km (motorways 1240 km).

Length of secondary network: 14.589 km.

Length of tertiary network: 109.022 km.

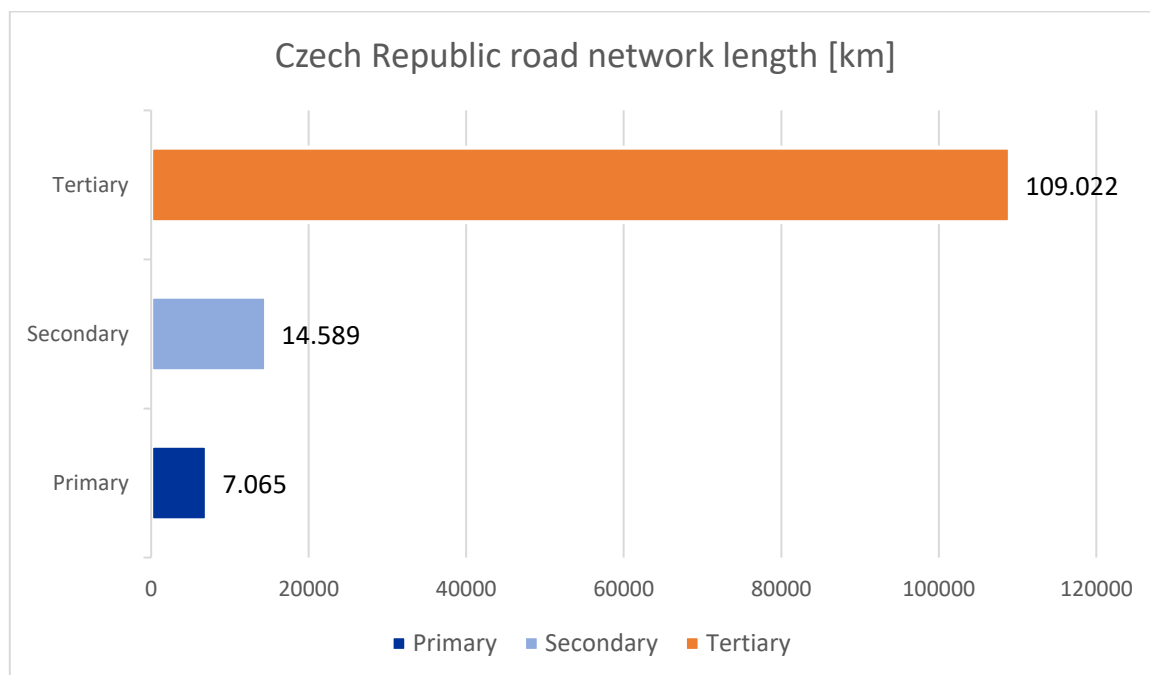


Figure 10 Road network length in the Czech Republic

Figure 10. shows the ratios of primary, secondary and tertiary roads in the Czech Republic (2017). As can be seen, the most common roads in the Czech Republic are tertiary roads with 109.022 km, followed by secondary roads with 14.589 km and primary roads with 7.065 km.

⁶ https://www.cia.gov/library/publications/resources/the-world-factbook/geos/print_ez.html

2.4.1.2 Crash data

Crash data of Czech Republic (2017)	
Number of fatalities	502
Vehicle occupant fatalities	291
Cyclist fatalities	44
Pedestrian fatalities	101
Motorcycle fatalities	63
Number of injuries	27,079
Fatalities / Mio. population	47.2

Table 7 Crash data of the Czech Republic

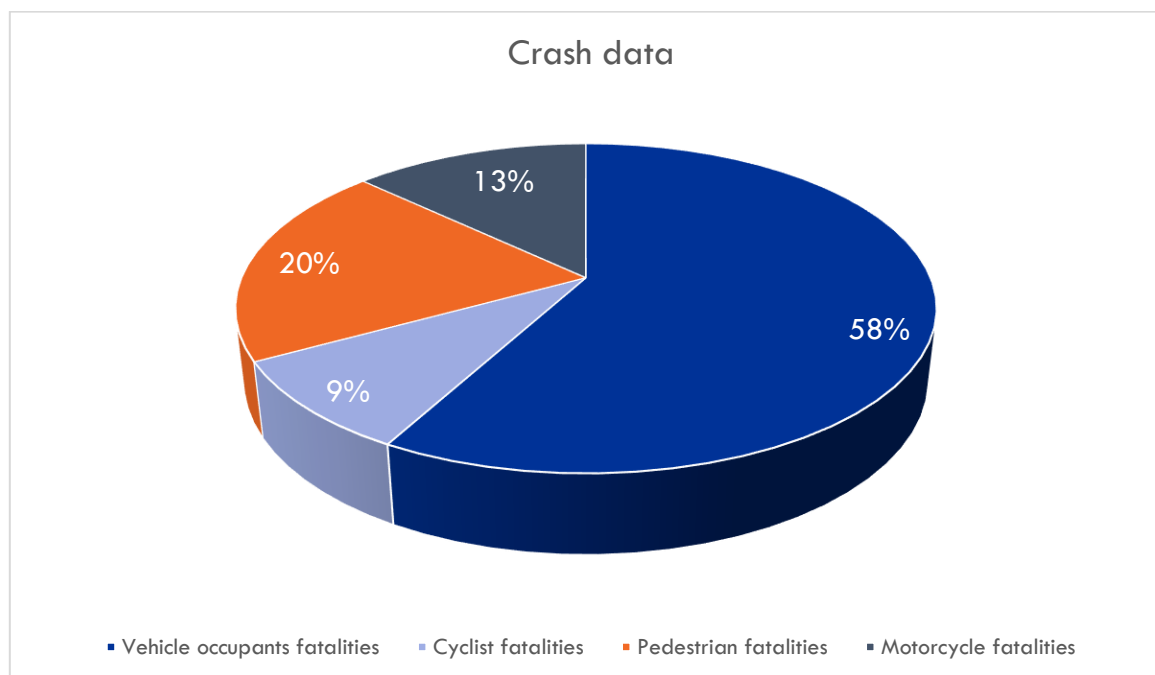


Figure 11 Crash data of the Czech Republic

Figure 11. shows the ratio of various types of accidents in the Czech Republic. Most common are vehicle occupant fatalities (291), followed by pedestrian fatalities (101), motorcycle fatalities (63) and cyclist fatalities (44).

2.4.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 110 km/h.

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 30 km/h.

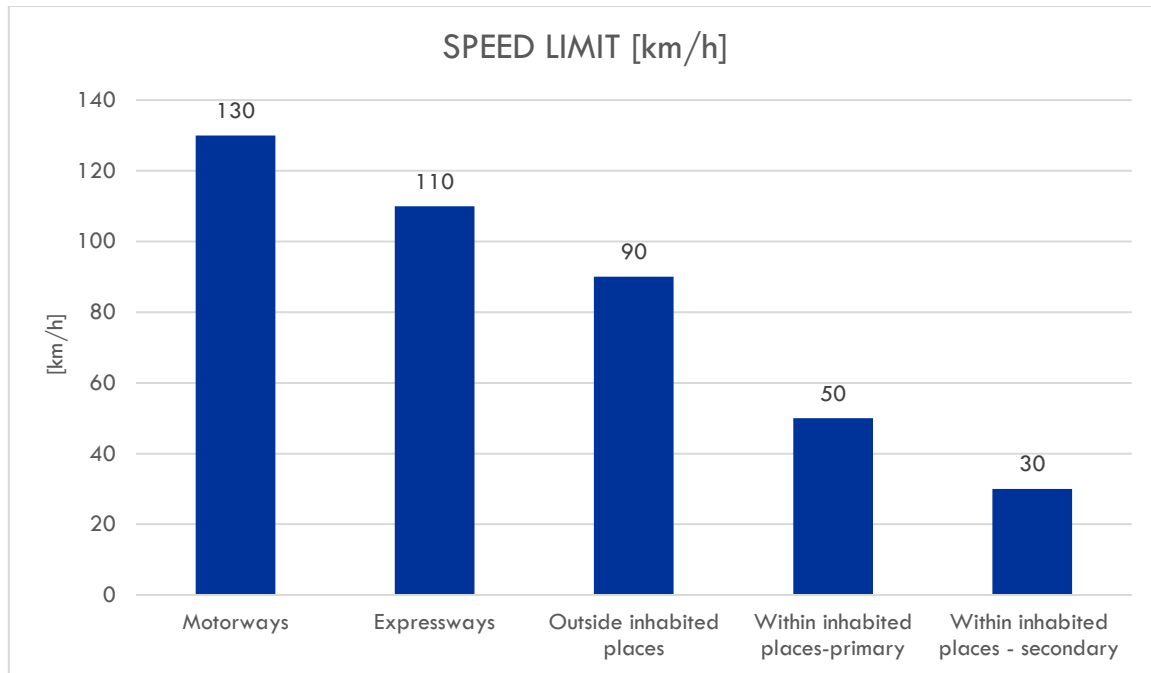


Figure 12 Speed limits in the Czech Republic

Figure 12. shows speed limits in the Czech Republic.

2.4.2. National Road Safety Strategy

The strategy (2011-2020) is annually updated and evaluated.

2.4.2.1 Targets

The objective of the National Road Safety Strategy 2011-2020 is to reduce the number of people killed in road traffic by 60 % by 2020 to the average of European countries and further to reduce the number of severely injured by 40 %.

2.4.2.2 Road safety budget

There is a very limited package within the State fund for Transport Infrastructure - dedicated to projects of road safety improvements and accessibility of disabled people, plus measures targeted to class II and III roads, amounting to ca. 0,5-1 % of the annual national budget. Safety measures are generally included in all projects of both constructions/reconstructions and maintenance.

2.4.2.3 Road safety funds

There are no available road safety funds.

2.4.2.4 Road Safety Agency and road safety departments with authorities

There is only a dedicated department in the Ministry of Transport – with main focus on soft projects of education and campaigning.

2.4.3. Infrastructure Safety Management

2.4.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Czech Republic has fully implemented the European Infrastructure Safety Directive. Positive increase in implementation of the Directive measures above the necessary TEN-T scale.

2.4.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Czech Republic	
Primary-motorways	National
Primary-other	National
Secondary	Local-Prefecture
Tertiary	Local-municipalities
Other	Local-municipalities

Table 8 Competences per road categories of Czech Republic

2.4.3.3 Priorities for assessing sections or roads for improvement

Assessment of hot spots, crash clusters or black spots.

2.4.3.4 Identification of high-risk sites

National methodology developed by Transport Research Centre; analysis of crash data, identification of cumulations; methodology for conducting road safety audits and inspections

2.4.3.5 In-depth crash analysis

Detailed analysis and statistics of Police with large focus on "culprit" perspective; new innovative and systematic methodological approaches developed by Transport Research Centre - still rather recommendations than compulsory exercises.

2.4.3.6 Data availability: Speed levels

Data is available on all roads on request from infrastructure managers.

2.4.3.7 Use of digital crash maps and road databases

Czech Republic use digital road databases and digital crash maps for mapping crashes.

2.4.3.8 Data availability: AADT

Data are available for all roads.

2.4.3.9 EuroRAP/iRAP Star Rating methodology

There is no data collected using EuroRAP/iRAP Star Rating methodology in Czech Republic

2.4.4. Facilities for VRUs

2.4.4.1 Pedestrians and cyclists

There is infrastructure for the safe movement of pedestrians and cyclists. Cycling infrastructure is present for all roads.

2.4.4.2 Motorcyclists

There is infrastructure for the safe movement motorcyclist.

2.5. Bulgaria

2.5.1. General data

Bulgaria is a country in Southeast Europe. It is bordered by Romania to the north, Serbia and Macedonia to the west, Greece and Turkey to the south, and the Black Sea to the east. The capital of Bulgaria is Sofia. Bulgaria covers 110,879 square kilometres of which 108,489 square kilometres are land and 2,390 square kilometres are water. Bulgaria has 7,057,504 inhabitants (July 2018 est.). Nominal GDP in 2018 is 49.77 billion EUR, with a nominal per capita GDP of 19,053 EUR.⁷

2.5.1.1 Republican road network

Length of primary network: 2.984 km⁸ (motorways 741 km).

Length of secondary network: 4.027 km.

Length of tertiary network: 11.781 km.

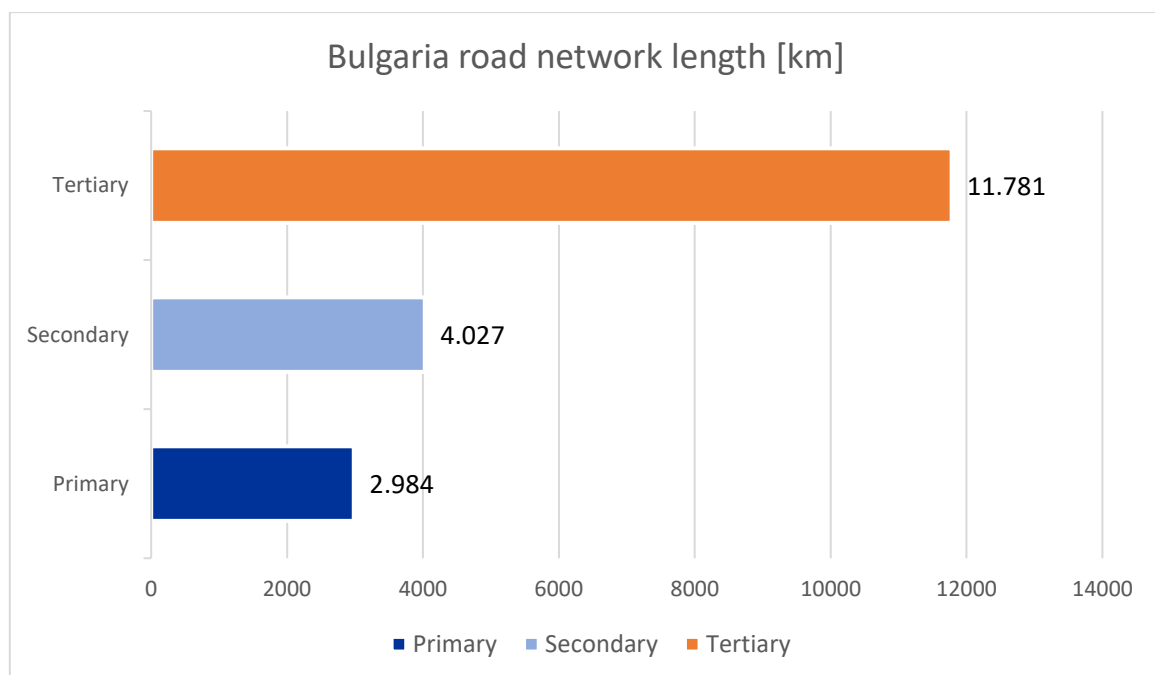


Figure 13 Road network length in Bulgaria

Figure 13. shows the ratios of primary, secondary and tertiary roads in Bulgaria (2017). As can be seen, the most common roads in Bulgaria are tertiary roads with 11.781 km, followed by secondary roads with 4.027 km and primary roads with 2.984 km.

⁷ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/bu.html>

⁸ Transport Infrastructure in the Danube region – ROAD LINKS, PROJECT REPORT, November 2018

2.5.1.2 Crash data

Crash data of Bulgaria (2017)	
Number of fatalities	682
Vehicle occupant fatalities	183
Cyclist fatalities	22
Pedestrian fatalities	157
Motorcycle fatalities	41
Number of injuries	8,680
Fatalities / Mio. population	96.7

Table 9 Crash data of Bulgaria

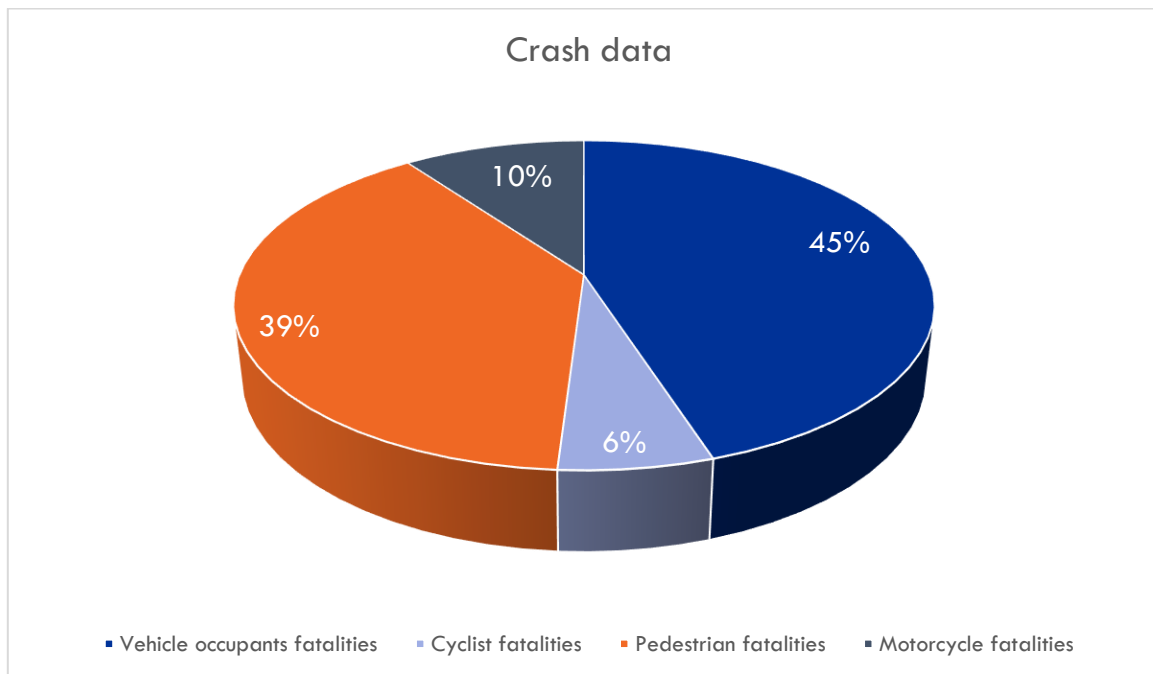


Figure 14 Crash data of Bulgaria

Figure 14. shows the ratio of various types of accidents in Bulgaria. Most common are vehicle occupant fatalities (183), followed by pedestrian fatalities (157), motorcycle fatalities (41) and cyclist fatalities (22)

2.5.1.3 Speed limits

Motorways: 140 km/h.

Expressways: 120 km/h.

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h.

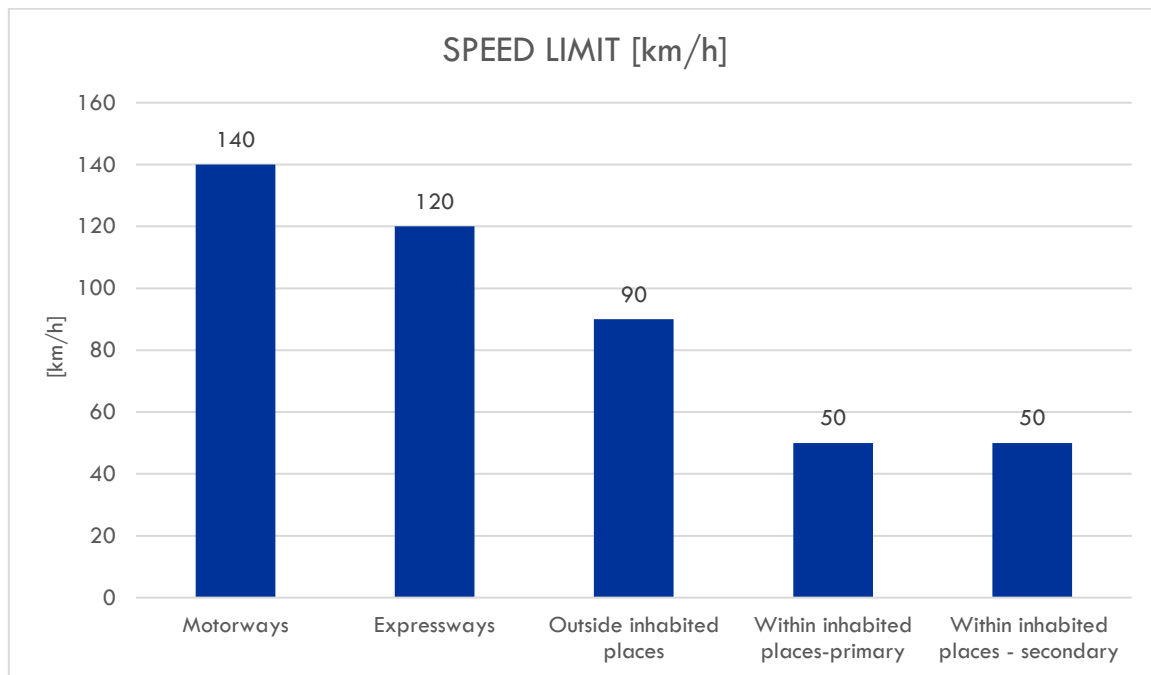


Figure 15 Speed limits in Bulgaria

Figure 15. shows speed limits in Bulgaria.

2.5.2. National Road Safety Strategy

Bulgaria has National road safety strategy in operation (2011-2020).

2.5.2.1 Targets

Reduction in the number of road fatalities by 50%. In 2020, they should not exceed 388. Reduction in the number of severe injuries on the road by 20%. In 2020, they should not exceed 6,363.⁹

2.5.2.2 Policy

The present policymaking strategy in road safety is based on the concept that most accidents are preventable and that reducing losses from road accidents is, above all, an expression of concern for the individual, the future and the nation's prosperity. Reducing road accidents entails coordinated action by institutions and a will to implement specific activities for the safe functioning of and the reduction of errors in the driver-vehicle-road system

⁹ https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/20151210_2_bg_-_move-2012-01301-00-00-en-tra_doc.pdf

2.5.2.3 Road safety budget

There is a dedicated budget for road safety in Bulgaria.

2.5.2.4 Road safety funds

There are no available road safety funds.

2.5.2.5 Road Safety Agency and road safety departments with authorities

There is no Road Safety Agency, but there is road safety department within Road Authority.

2.5.3. Infrastructure Safety Management

2.5.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Bulgaria has fully implemented the European Infrastructure Safety Directive. This goes for all mechanisms mentioned in the Directive: RSIA, NWRSA, RSI, RSA.

2.5.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Bulgaria	
Primary-motorways	National
Primary-other	National
Secondary	National
Tertiary	National
Other	Local municipalities

Table 10 Competences per road categories of Bulgaria

2.5.3.3 Priorities for assessing sections or roads for improvement

Assessing of hot spots, crash clusters or black spots.

2.5.3.4 Identification of high-risk sites

Establishing and securing the road sections with high concentration of road accidents and categorizing them.

2.5.3.5 In-depth crash analysis

There is currently no in-depth crash analysis.

2.5.3.6 Data availability: Speed levels

Operating speed data are not available.

2.5.3.7 Use of digital crash maps and road databases

There are no road databases in use, but there are digital maps for mapping crashes.

2.5.3.8 Data availability: AADT

Data are available for the whole network.

2.5.3.9 EuroRAP/iRAP Star Rating methodology

Bulgaria has data for 641 km of roads that have been collected using EuroRAP/iRAP Star Rating methodology.

2.5.4. Facilities for VRUs

2.5.4.1 Pedestrians and cyclists

There is infrastructure for the safe movement of cyclists.

2.5.4.2 Motorcyclists

There is infrastructure for the safe movement of motorcyclists.

2.6. Austria

2.6.1. General data

Austria is a country of central Europe that lies on the right side of the Danube area. It is bordered by the Czech Republic and Germany to the north, Slovakia and Hungary to the east, Slovenia and Italy to the south, and Switzerland and Liechtenstein to the west. Austria covers 83,871 square kilometres of which 82,445 square kilometres are land and 1,426 square kilometres are water. Austria has 8,793,370 inhabitants (July 2018 est.). Austria has a mostly mountainous terrain with a mainly continental climate. The capital of Austria is Wien. Nominal GDP in 2018 was 365.71 billion EUR, with a nominal per capita GDP of 43,801 EUR.¹⁰

2.6.1.1 Road network

Length of primary network: motorways 1.719 km
expressways 514 km.

Length of secondary network (rural roads): 33.652 km.

Length of tertiary network (inside urban areas): 100.633 km.

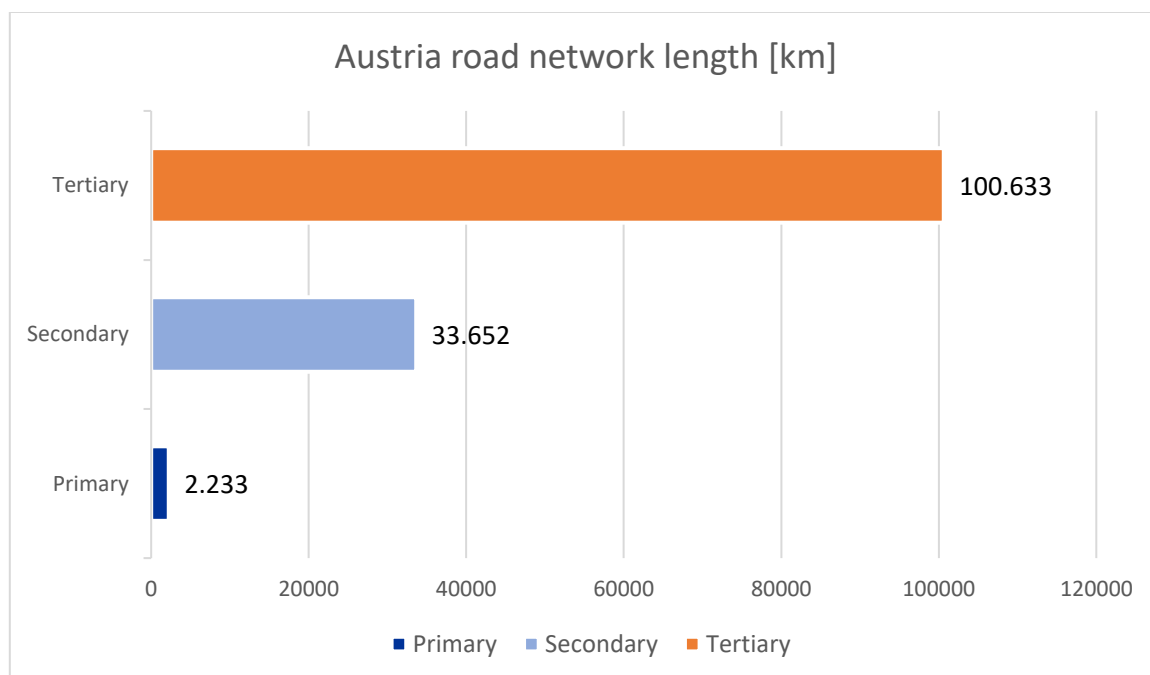


Figure 16 Road network length in Austria

Figure 16. shows the ratios of primary, secondary and tertiary roads in Austria (2017). As can be seen, the most common roads in Austria are tertiary roads with 100.633 km, followed by secondary roads with 33.652 km and primary roads with 2.233 km.

¹⁰ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/au.html>

2.6.1.2. Crash data

Crash data of Austria (2017)	
Number of fatalities	414
Vehicle occupant fatalities	206
Passenger car fatalities	182
Cyclist fatalities	32
Pedestrian fatalities	74
Motorcycle fatalities	83
Number of injuries	47,258
Fatalities / Mio. population	46.7

Table 11 Crash data of Austria

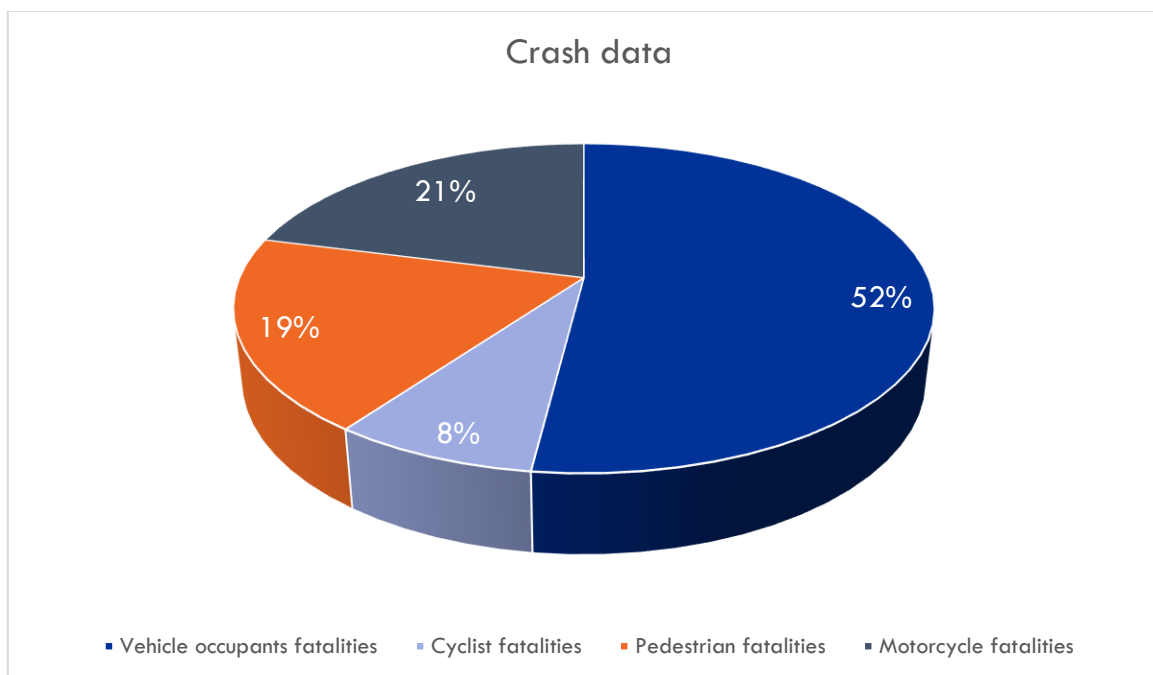


Figure 17 Crash data of Austria

Figure 17. shows the ratio of various types of accidents in Austria. Most common are vehicle occupant fatalities (206), followed by motorcycle fatalities (83), pedestrian fatalities (74) and cyclist fatalities (32).

2.6.1.3. Speed limits

Motorways: 130 km/h.

Expressways: 130 km/h. ("Schnellstraßen", speed limit up to 130, depending on the layout

Outside inhabited places: 100 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h (many municipalities have turned to posting a 30 km/h limit on roads off main routes).

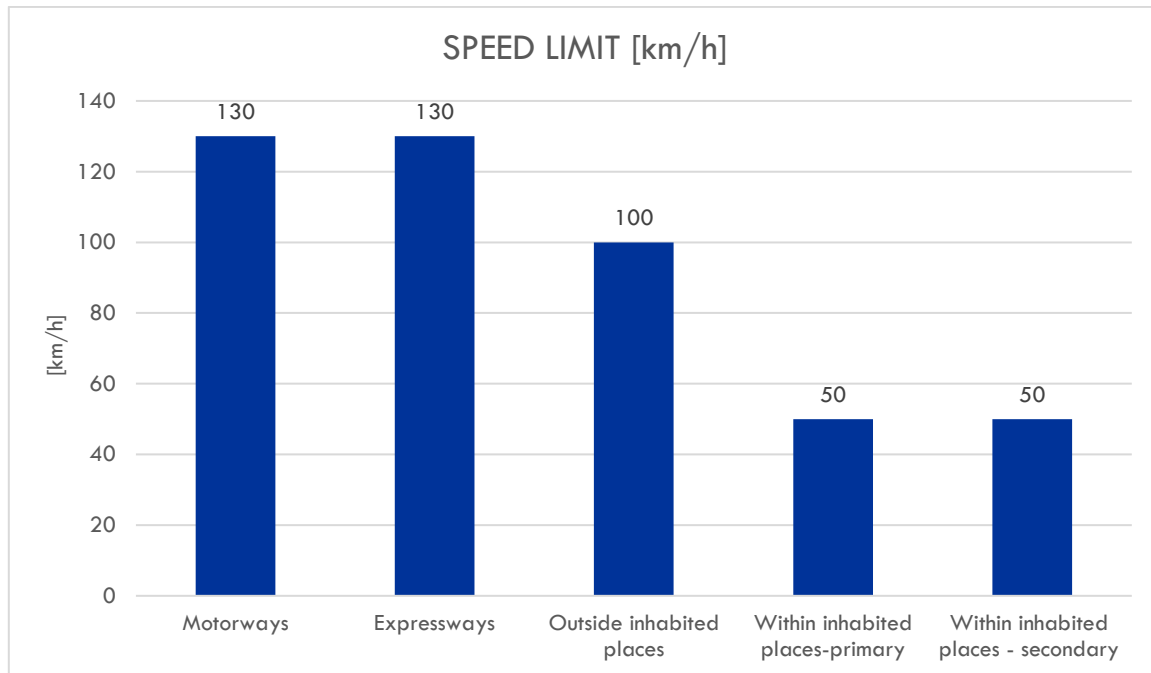


Figure 18 Speed limits in Austria

Figure 18. shows speed limits in Austria.

2.6.2. National Road Safety Strategy

Austria has a national road safety strategy in operation (2011-2020). The current version is available at https://www.bmvit.gv.at/en/service/publications/transport/downloads/rsp2020_2016.pdf

2.6.2.1 Targets

The following targets have been set for 2020 in the above strategy: 50% fewer fatalities, 40% fewer serious injuries, 20% fewer injury accidents.¹¹

2.6.2.1 Policy

The programme boasts around 300 measures in 17 fields of action.

¹¹ https://www.bmvit.gv.at/en/service/publications/transport/downloads/roadsafety_report2016.pdf

2.6.2.2 Road safety budget

In Austria, no dedicated budget for road safety has been earmarked. All funds used for the design, construction, maintenance and operation of roads are considered to provide added value for safety.

2.6.2.3 Road safety funds

The Austrian Road Safety fund is financed from revenues from customised licence plates. It is based at the Ministry of Transport, Innovation and Technology and used to support road safety research, activities and campaigns at national and regional levels.

2.6.2.4 Evaluations

A new culture of evaluations has been developing over recent years, especially for road safety campaigns. Similar is true for black spot treatments in some regions, but not across the board.

2.6.2.5 Road Safety Agency and road safety departments with authorities

In Austria, there is no dedicated road safety agency. Responsibilities for road safety at national level are taken by road safety department of the Ministry of Transport, Innovation and Technology. The regional level is covered by road safety departments of one of the nine Austrian regions. As concerns municipalities, the larger cities have road safety departments, small municipalities often have none - but are sometimes supported by the regional authorities or agencies thereof.

2.6.3. Infrastructure Safety Management

2.6.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Austria has fully implemented the European Infrastructure Safety Directive on the Austrian TERN and the rest of the motorway and expressway network (Autobahn, Schnellstraße). This goes for all mechanisms mentioned in the Directive: RSIA, NWRSA, RSI, RSA. Detailed information on Road Safety Audit and Road Safety Inspections is not publicly available.

2.6.3.2 Applied standard for road infrastructure

The following guidelines are in use: The Austrian Guidelines for Road Construction & Maintenance RVS:

<http://www.fsv.at/shop/artikelliste.aspx?ID=feb917e9-2686-47f6-9e49-c866c8f2cd7b&ID2=2>

2.6.3.3 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Austria	
Primary-motorways ('Autobahn'):	National - ASFINAG, an executive agency of the Ministry of Transport
Primary-other (Expressways – 'Schnellstraße')	National - ASFINAG, an executive agency of the Ministry of Transport
Secondary (regional roads – 'Landesstraße'):	Regional authorities (9 in Austria)
Tertiary (municipal roads – 'Gemeindestraße')	Local municipalities (>1,200 municipalities)

Table 12 Competences per road categories of Austria

2.6.3.4 Priorities for assessing sections or roads for improvement

In Austria, there is a clear priority for the identification of high-risk sites as a basis for decision on improvements. The Austrian definition of high-risk site puts emphasis on the similarity of crash types (see next chapter).

2.6.3.5 Identification of high-risk sites

In Austria, the following definition is used to define black spots:

- a) 3 or more similar injury accidents in three years or
- b) 5 or more similar accidents (including property-damage-only) in one year, on a stretch of up to 250m.

2.6.3.6 In-depth crash analysis

There is currently no in-depth crash analysis being carried out in Austria. For individual research projects, the KfV has in the past acquired permission to analyse (closed) court files of crashes.

2.6.3.7 Use of digital crash maps and road databases

The Austrian Statistics Bureau publishes the following crash map: <https://www.statistik.at/verkehrsunfallkarte/>

As concerns detailed road databases, the *GIP platform* ("Graphenintegrationsplattform") has been developed, it is still under construction, and is currently populated by the responsible authorities at national, regional and local level.

2.6.3.8 Data availability: Speed levels

KfV has been collecting operating speed data for decades. For motorways (expressways only partially) data is available for cars (v mean, v median, v85) at different speed limits.

For regional and municipal roads, data is available for passenger cars as well as for trucks & busses.

2.6.3.9 Data availability: AADT

Data for motorways and expressways is – in principle – available from ASFINAG, an executive agency of the Ministry of Transport.

For other roads, depending on the region there are sometimes models, sometimes estimations and assignment to flow classes available.

2.6.3.10 EuroRAP/iRAP Star Rating methodology

The EuroRAP/iRAP is superficially known by road safety experts, however no EuroRAP/iRAP data collection has ever taken place (apart from a risk mapping exercise of ÖAMTC and KFV in the early 2000s).

2.6.4. Facilities for VRUs

2.6.4.1 Pedestrians and cyclists

Traffic calming and provision of proper facilities for pedestrians and cyclists has become a common approach in Austrian municipalities.

2.6.4.2 Motorcyclists

Typical accident-prone motorcycle routes in Austria are gradually equipped with forgiving furniture, e.g. guardrail underrun protection.

2.7. Bosnia and Herzegovina

2.7.1. General data

Bosnia and Herzegovina (BiH) is a country in South-eastern Europe, located within the Balkan Peninsula. BiH is an almost landlocked country – it has a narrow coast at the Adriatic Sea, about 20 kilometres long. It is bordered by Croatia to the north, west and south; Serbia to the east; and Montenegro to the southeast, sharing a maritime border with Italy. The capital of BiH is Sarajevo. BiH covers 51,197 square kilometres of which 51,187 square kilometres are land and 10 square kilometres are water. BiH has 3,849,891 inhabitants (July 2018 est.). Nominal GDP in 2018 was 15.9 billion EUR, with a nominal per capita GDP of 11,194 EUR.¹²

2.7.1.1 Road network

Length of primary network: motorways 172.3 km.
 expressways 28.7 km.

Length of secondary network: magistral roads 3.788 km (RS1.764 km, FBiH 2.024 km).

Length of tertiary network: regional roads 4.842 km (RS 2.118 km, FBiH 2.724 km).

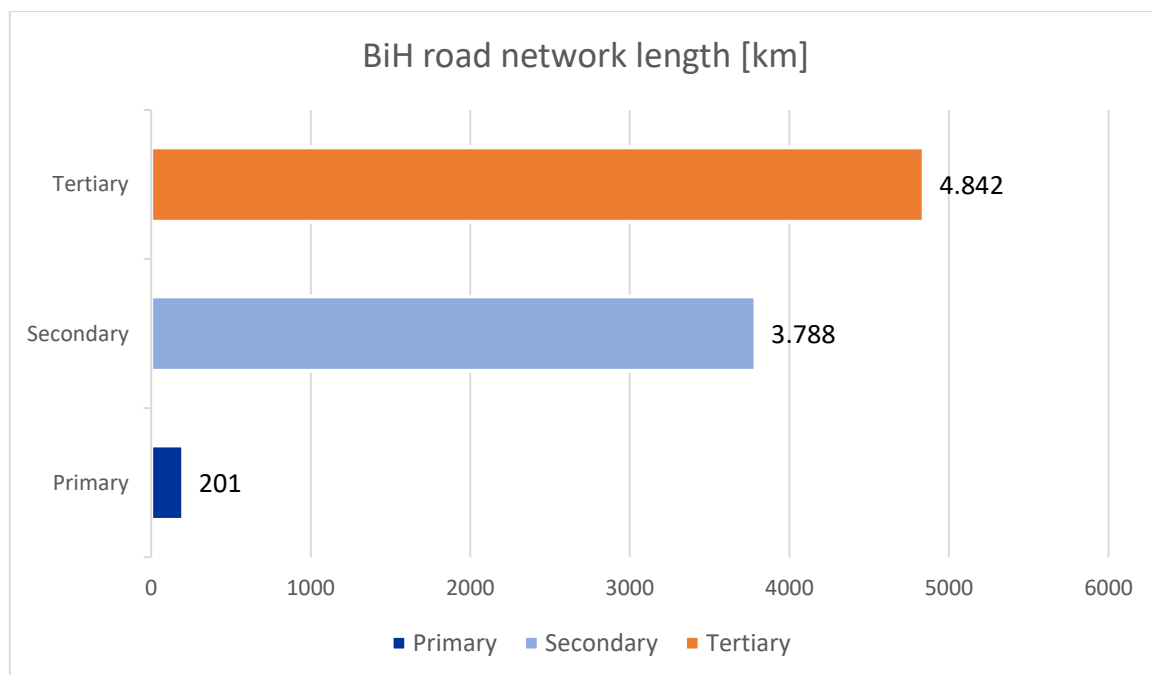


Figure 19 Road network length in Bosnia and Herzegovina

Figure 19. shows the ratios of primary, secondary and tertiary roads in Bosnia and Herzegovina (2017). As can be seen, the most common roads in Bosnia and Herzegovina are tertiary roads with 4,842 km, followed by secondary roads with 3,788 km and primary roads with 201 km.

¹² <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/bk.html>

2.7.1.2 Crash data

Crash data of Bosnia and Herzegovina (2017)	
Number of fatalities	298
Vehicle occupant fatalities	180
Cyclist fatalities	7
Pedestrian fatalities	72
Motorcycles fatalities	9
Number of injuries	10,229
Fatalities / Mio. population	84.9

Table 13 Crash data of Bosnia and Herzegovina

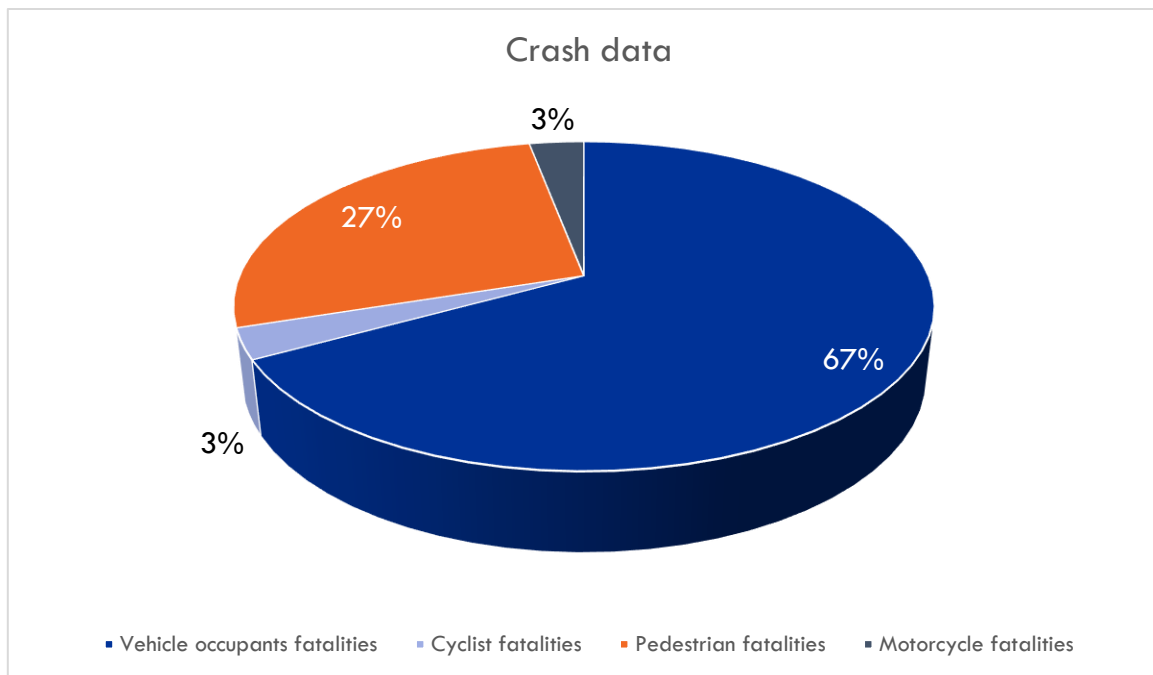


Figure 20 Crash data of Bosnia and Herzegovina

Figure 20. shows the ratio of various types of accidents in Bosnia and Herzegovina. Most common are vehicle occupant fatalities (180), followed by pedestrian fatalities (72), cyclist fatalities (7) and motorcycles fatalities (9).

2.7.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 100 km/h.

Outside inhabited places: 80 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 40 km/h.

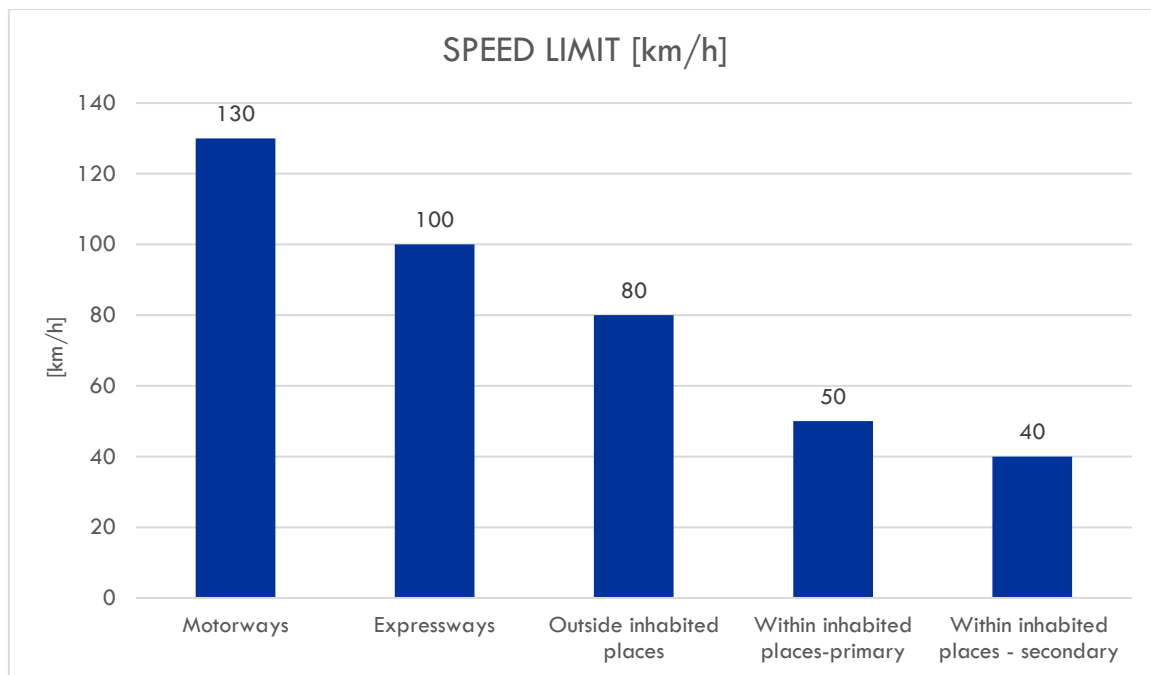


Figure 21 Speed limits in Bosnia and Herzegovina

Figure 21. shows speed limits in Bosnia and Herzegovina.

2.7.2. National Road Safety Strategy

Bosnia and Herzegovina has an Action plan of road safety FBIH 2011-2020.

2.7.2.1 Targets

The main goal is to reduce the number of fatally injured people by 50% by 2020.¹³

2.7.2.2 Road safety budget

There is budget for road safety in Bosnia and Herzegovina.

2.7.2.3 Road safety funds

There is dedicated road safety fund on national level (250,000 Eur).

2.7.2.4 Evaluations

Not all of the funds are spent for the intended purpose.

¹³ http://ipcfbih.ba/assets/upload/dokumenti-o-sigurnosti/akcioni_plan_sigurnosti_2011_202.pdf

2.7.2.5 Road Safety Agency and road safety departments with authorities

There is no Road Safety Agency in Bosnia and Herzegovina, but there are road safety departments within Ministry of Communications and Transport, Road Authorities and on local level.

2.7.3. Infrastructure Safety Management

2.7.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Infrastructure Safety Directive 96/2008/EC is implemented in law, but procedures from Directive (NWRSA, RSIA, RSI, RSA) are not applied.

2.7.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Bosnia and Herzegovina	
Primary-motorways	National – JP Autoceste FBiH, Autoputevi RS
Primary-other	National – JP Ceste FBiH, JP Putevi RS
Secondary	Local - Prefecture
Tertiary	Local municipalities

Table 14 Competences per road categories of Bosnia and Herzegovina

2.7.3.3 Priorities for assessing sections or roads for improvement

Assessing of hot spots, crash clusters or black spots.

2.7.3.4 Identification of high-risk sites

3 or more similar injury accidents in three years or 5 or more similar accidents (including property-damage-only) in one year.

2.7.3.5 In-depth crash analysis

Accident expertise only used for judicial proceedings.

2.7.3.6 Data availability: Speed levels

Operating speed data are not available. It is possible to get data for motorways, but it takes time.

2.7.3.7 Use of digital crash maps and road databases

Bosnia and Herzegovina has road databases, but not for the whole road network. There are no digital crash maps.

2.7.3.8 Data availability: AADT

Data are available for all road categories.

2.7.3.9 EuroRAP/iRAP Star Rating methodology

Bosnia and Herzegovina has data for 2.044 km of roads that have been collected using EuroRAP/iRAP Star Rating methodology.

2.7.4. Facilities for VRUs

2.7.4.1 Pedestrians and cyclists

There are overpasses and underpasses for pedestrians. Traffic calming measures are in use. Larger cities have cycling infrastructure.

2.7.4.2 Motorcyclists

There is no specific infrastructure for the safe movement motorcyclist.

2.8. Serbia

2.8.1. General data

Serbia is a country situated at the crossroads of Central and Southeast Europe in the southern Pannonian Plain and the central Balkans. The sovereign state borders Hungary to the north, Romania to the northeast, Bulgaria to the southeast, Macedonia to the south, Croatia, Bosnia and Herzegovina, and Montenegro to the southwest. The capital of Serbia is Belgrade. Serbia covers 77,474 square kilometres of which all are land. Serbia has 7,078,110 inhabitants (July 2018 est.). Nominal GDP in 2018 was 36.23 billion EUR, with a nominal per capita GDP of 13,205 EUR.¹⁴

2.8.1.1 Road network

Length of primary network:	Motorways 781 km.
Length of primary-other network:	National roads Class IIA 7.783 km
Length of secondary network:	National roads Class B 7.656 km.
Length of tertiary network:	Municipal roads 29.374 km.

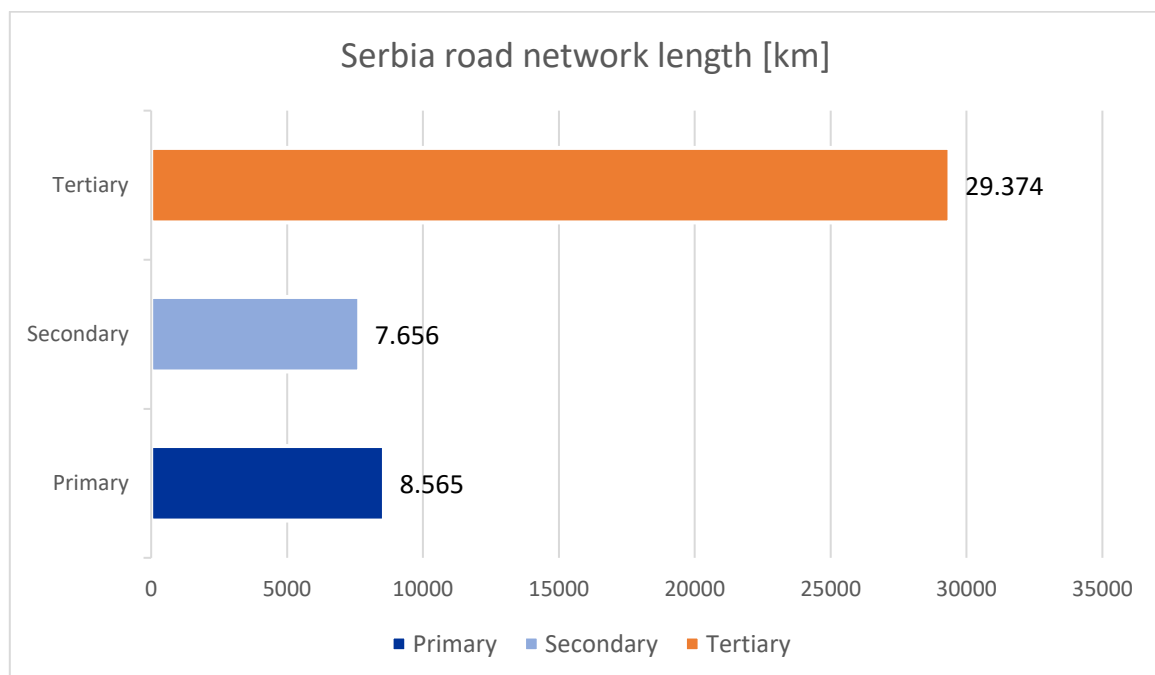


Figure 22 Road network length in Serbia

Figure 22. shows the ratios of primary, secondary and tertiary roads in Serbia (2017). As can be seen, the most common roads in Serbia are tertiary roads with 29.374 km, followed by primary roads with 8.565 km and secondary roads with 7.656 km.

¹⁴ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ri.html>

2.8.1.2 Crash data

Crash data of Serbia (2017)	
Number of fatalities	579
Vehicle occupant fatalities	340
Cyclist fatalities	48
Pedestrian fatalities	141
Motorcycle fatalities	47
Number of injuries	21,277
Fatalities / Mio. population	82.7

Table 15 Crash data of Serbia

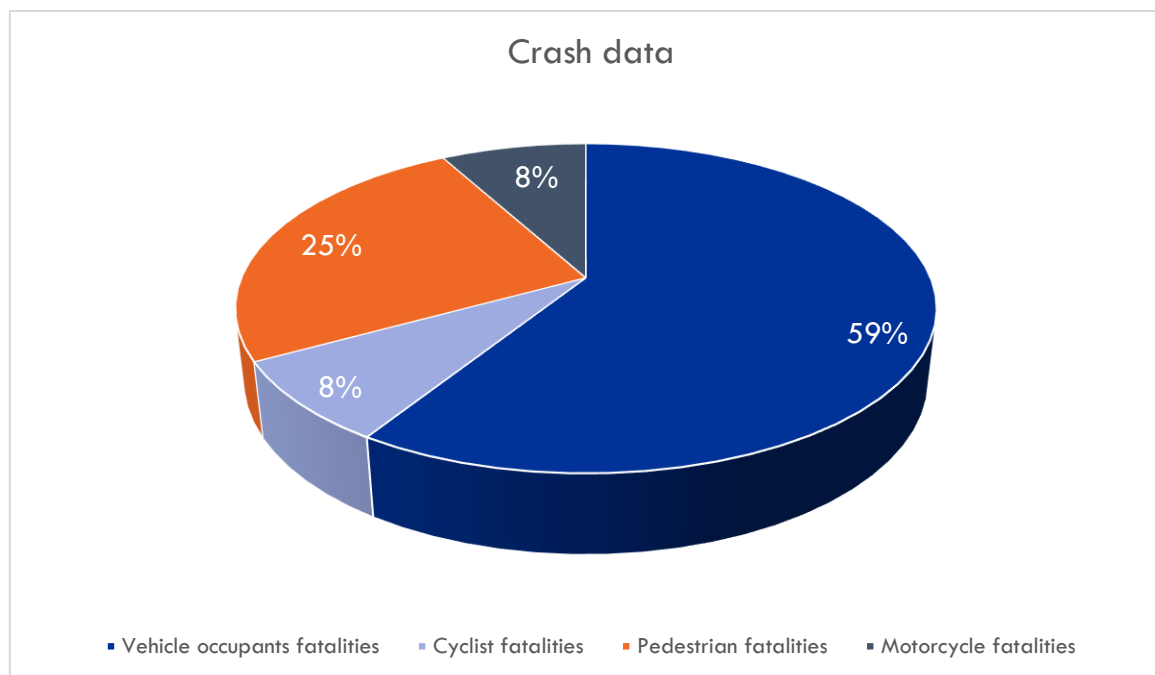


Figure 23 Crash data of Serbia

Figure 23. shows the ratio of various types of accidents in Serbia. Most common are vehicle occupant fatalities (340), followed by pedestrian fatalities (141), cyclist fatalities (48) and motorcycle fatalities (41).

2.8.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 100 km/h.

Outside inhabited places: 80 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 30 km/h.

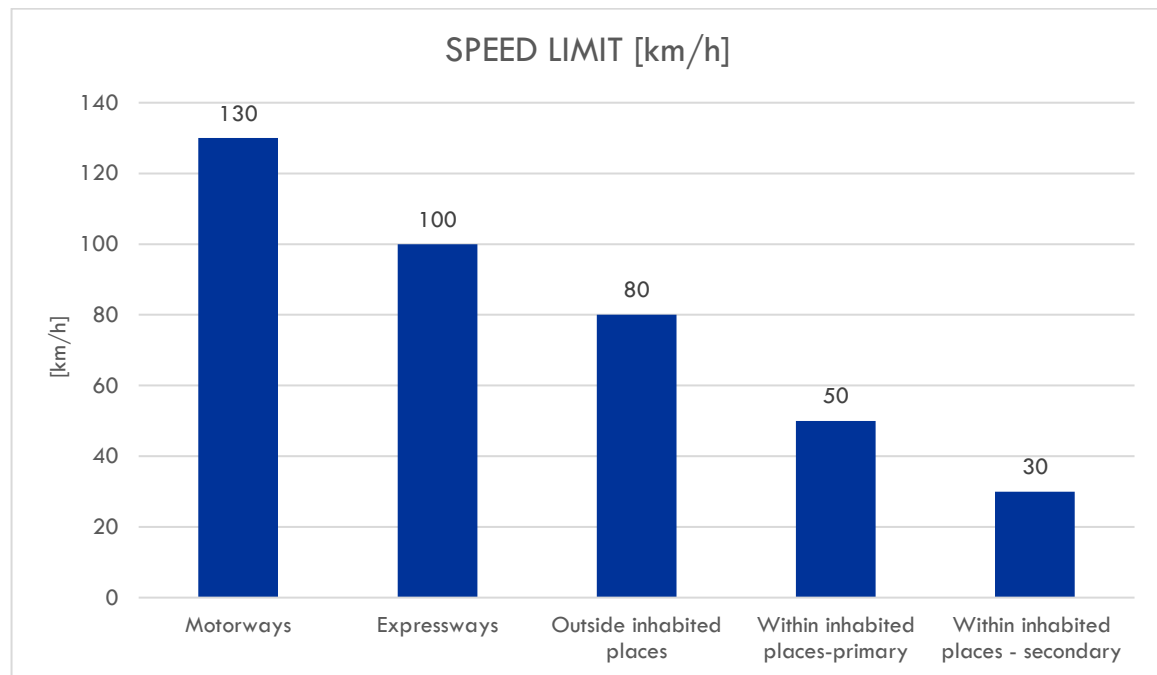


Figure 24 Speed limits in Serbia

Figure 24. shows speed limits in Serbia.

2.8.2. National Road Safety Strategy

Serbia has National road safety strategy in operation (2015-2020).

2.8.2.1 Targets

No children killed in traffic by 2020, reduce the number of road deaths and those seriously injured by 50% between 2011 and 2020, to halve the total annual social-economic costs of road crashes.¹⁵

2.8.2.2 Policy

Strategic orientation of the Republic of Serbia in road transport sector towards increasing the level of road and traffic safety along with the functional integration into the European road network. Road authorities should manage the traffic safety improvement on state roads in accordance with the development policy and objectives of the Republic of Serbia.

¹⁵ <https://www.itf-oecd.org/sites/default/files/serbia-road-safety.pdf>

2.8.2.3 Road safety budget

There is budget for road safety in Serbia.

2.8.2.4 Road safety funds

There are funds dedicated to increase traffic safety in Serbia. Most of the funds are provided by World Bank, European Pre-accession funds and various EU projects.

2.8.2.5 Evaluations

Defined by Law on Road Traffic Safety.

2.8.2.6 Road Safety Agency and road safety departments with authorities

There is Road Safety Agency in Serbia and road safety departments within Ministry and Road Authority.

2.8.3. Infrastructure Safety Management

2.8.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Infrastructure Safety Directive 2008/96/EC is implemented in law, but the NWRSA and RSIA procedures of the Directive are not applied.

2.8.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Serbia	
Primary-motorways	National – JP Roads of Serbia
Primary-other	National – JP Roads of Serbia
Secondary	Local municipalities
Tertiary	Local municipalities

Table 16 Competences per road categories of Serbia

2.8.3.3 Priorities for assessing sections or roads for improvement

Looking at the whole network and trying to improve the standard of it all.

2.8.3.4 Identification of high-risk sites

Place on the road with a length of not more than 500 meters where at least two traffic accidents with injured or fatalities have occurred due to local risk factors in the last three-year period.

2.8.3.5 In-depth crash analysis

In-depth analysis is mainly focus on contribution of roads to the occurrence of road accidents.

2.8.3.6 Data availability: Speed levels

Data for the primary and secondary network are available.

2.8.3.7 Use of digital crash maps and road databases

Serbia uses digital crash maps developed by the Road Safety Agency.

2.8.3.8 Data availability: AADT

Data are available for the primary and secondary road network.

2.8.3.9 EuroRAP/iRAP Star Rating methodology

Serbia has data for 3,000 km of roads that have been collected using EuroRAP/iRAP Star Rating methodology.

2.8.4. Facilities for VRUs

2.8.4.1 Pedestrians and cyclists

Traffic calming measures are in use. Larger cities have cycling infrastructure.

2.8.4.2 Motorcyclists

There is no specific infrastructure for the safe movement motorcyclist.

2.9. Moldova

2.9.1. General data

Moldova is a landlocked country in Eastern Europe, bordered by Romania to the west and Ukraine to the north, east, and south. The capital of Moldova is Kishinev. Bulgaria covers 33,851 square kilometres of which 32,891 square kilometres are land and 960 square kilometres are water. Bulgaria has 3,437,720 inhabitants (July 2018 est.). Nominal GDP in 2018 was 8.35 billion EUR, with a nominal per capita GDP of 5,856 EUR.¹⁶

2.9.1.1 Road network

Length of primary network: 2.629 km.

Length of secondary network: 3.277 km.

Length of tertiary network: 3.394 km.

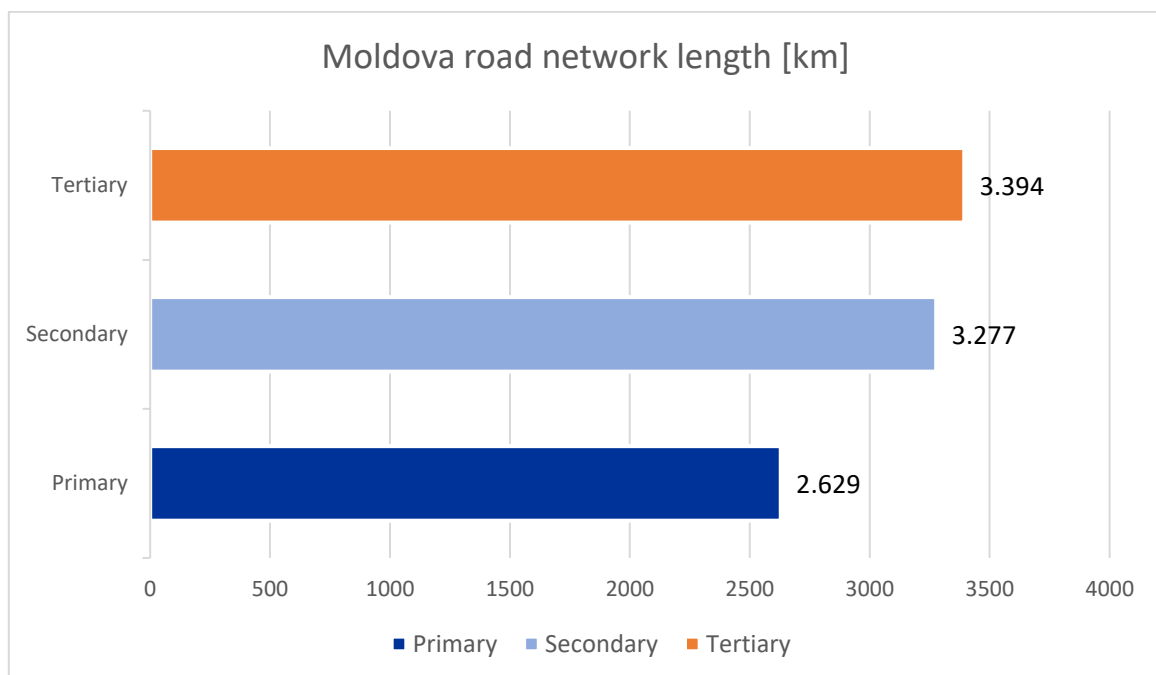


Figure 25 Road network length in Moldova

Figure 25. shows the ratios of secondary and tertiary roads in Moldova (2017). As can be seen, the most common roads in Moldova are tertiary roads with 3.394 km, followed by secondary roads with 3.277 km and primary roads with 2.629.

¹⁶ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/md.html>

2.9.1.2 Crash data

Crash data of Moldova (2017)	
Number of fatalities	273
Vehicle occupant fatalities	124
Cyclist fatalities	12
Pedestrian fatalities	123
Motorcycle fatalities	14
Number of injuries	2,846
Fatalities / Mio. population	76.6

Table 17 Crash data of Moldova

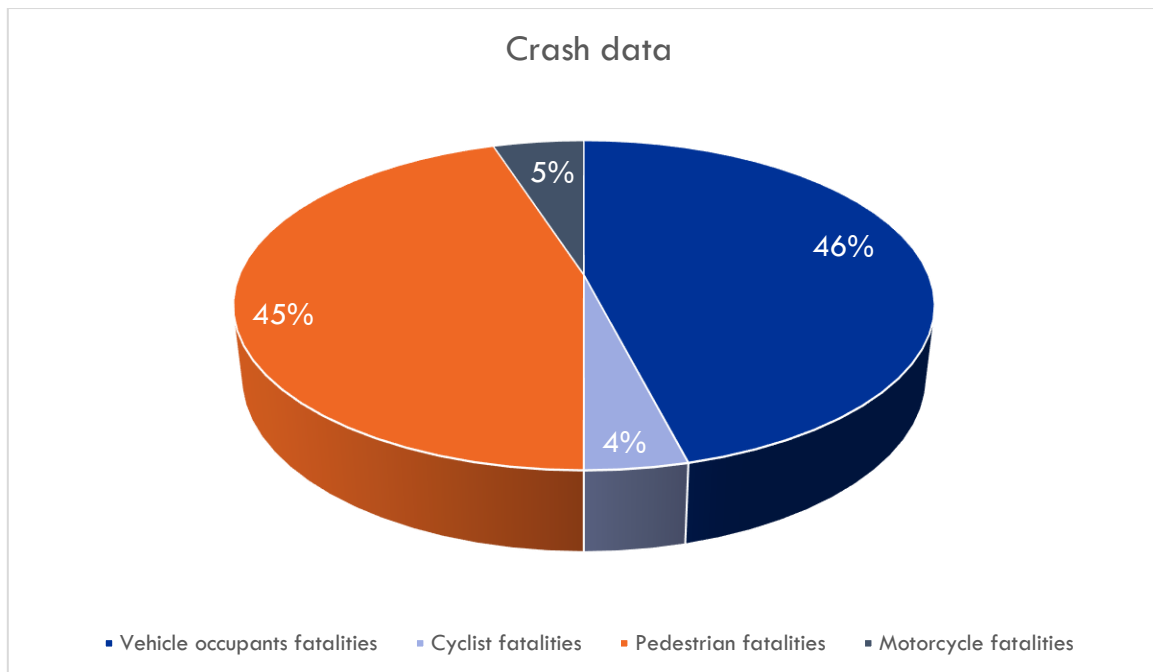


Figure 26 Crash data of Moldova

Figure 26. shows the ratio of various types of accidents in Moldova. Most common are vehicle occupant fatalities (124), followed by pedestrian fatalities (123), motorcycle fatalities (14) and cyclist fatalities (12).

2.9.1.3 Speed limits

Motorways: 110 km/h.

Expressways: 110 km/h.

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h.

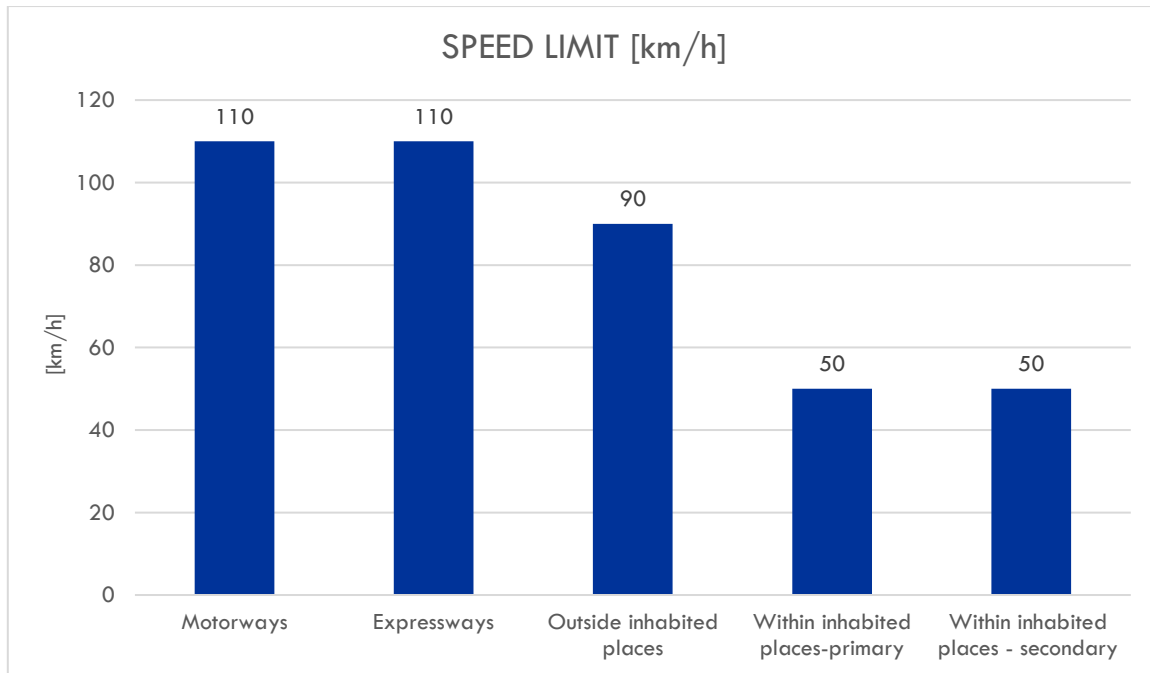


Figure 27 Speed limits in Moldova

Figure 27. shows speed limits in Moldova.

2.9.2. National Road Safety Strategy

Moldova has a National road safety strategy in operation (2015-2020).

2.9.2.1 Targets

The gradual reduction in the percentage of deaths and serious injuries (50% by 2020.), through the combination of passive and active measures of road safety and the improvement of road infrastructure, road user behaviour by training, raising awareness, licensing, compliance with traffic regulations.¹⁷

2.9.2.2 Road safety budget

There is no dedicated budget for road safety.

¹⁷

https://ec.europa.eu/transport/sites/transport/files/themes/international/european_neighbourhood_policy/european_eastern_partnership/doc/tenth-eastern-partnership-transport-panel/road_safety_in_moldova.pdf

2.9.2.3 Road safety funds

Responsible authorities have access to external sources of funding, IFI's and other international projects are often interested to work with local authorities such as Police or Ministries in order to improve the level of Road Safety in the country and carry out road safety campaigns.

2.9.2.4 Road Safety Agency and road safety departments with authorities

There is no Road Safety Agency, but there is a lot of discussion regarding its establishment, the main problem that occurs is its funding and employees' wages (lack of money and lack of interest of some authorities). There are road safety departments within relevant Ministry and road authority.

2.9.3. Infrastructure Safety Management

2.9.3.1 Implementation of the Infrastructure Safety Directive 2008/96/EC

Infrastructure Safety Directive 2008/96/EC is partially implemented in law, but the NWRSA and RSIA procedures of the Directive are not applied.

2.9.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Moldova	
Primary-motorways	National
Primary-other	National
Secondary	Local-Prefecture
Tertiary	Local-municipalities
Other	Local-municipalities

Table 18 Competences per road categories of Moldova

2.9.3.3 Priorities for assessing sections or roads for improvement

Assessing particular routes to improve them.

2.9.3.4 Identification of high-risk sites

Section on the road with a length of 1 km where at least 5 fatalities have occurred in the last 5-year period.

2.9.3.5 In-depth crash analysis

The National Patrolling Inspectorate collects crash data and there is available a more detailed analysis of accidents though the accuracy on a 1-10 scale would be 6-7.

2.9.3.6 Data availability: Speed levels

Operating speed data are available for National Roads (primary and secondary).

2.9.3.7 Use of digital crash maps and road databases

Moldova has detailed road databases. There is no digital crash maps.

2.9.3.8 Data availability: AADT

Data are available for National roads and part of local roads.

2.9.3.9 EuroRAP/iRAP Star Rating methodology

Moldova has data for 2.500 km of roads that have been collected using EuroRAP/iRAP Star Rating methodology.

2.9.4. Facilities for VRUs

2.9.4.1 Pedestrians and cyclists

There is infrastructure for the safe movement of pedestrians. Cycling infrastructure is not present.

2.9.4.2 Motorcyclists

There is no infrastructure for the safe movement of motorcyclists.

2.10. Slovakia

2.10.1. General data

Slovakia is a landlocked country in Central Europe. It is bordered by Poland to the north, Ukraine to the east, Hungary to the south, Austria to the west, and the Czech Republic to the northwest. The capital of Slovakia is Bratislava. Slovakia covers 49,035 square kilometres of which 48,105 square kilometres are land and 930 square kilometres are water. Slovakia has 5,445,040 inhabitants (July 2018 est.). Nominal GDP in 2018 was 83.83 billion EUR, with a nominal per capita GDP of 28,928 EUR.¹⁸

2.10.1.1 Road network

Length of primary network:	motorways 483 km expressways 295 km primary other 2.532 km.
Length of secondary network:	3.610 km.
Length of tertiary network:	10.357 km.

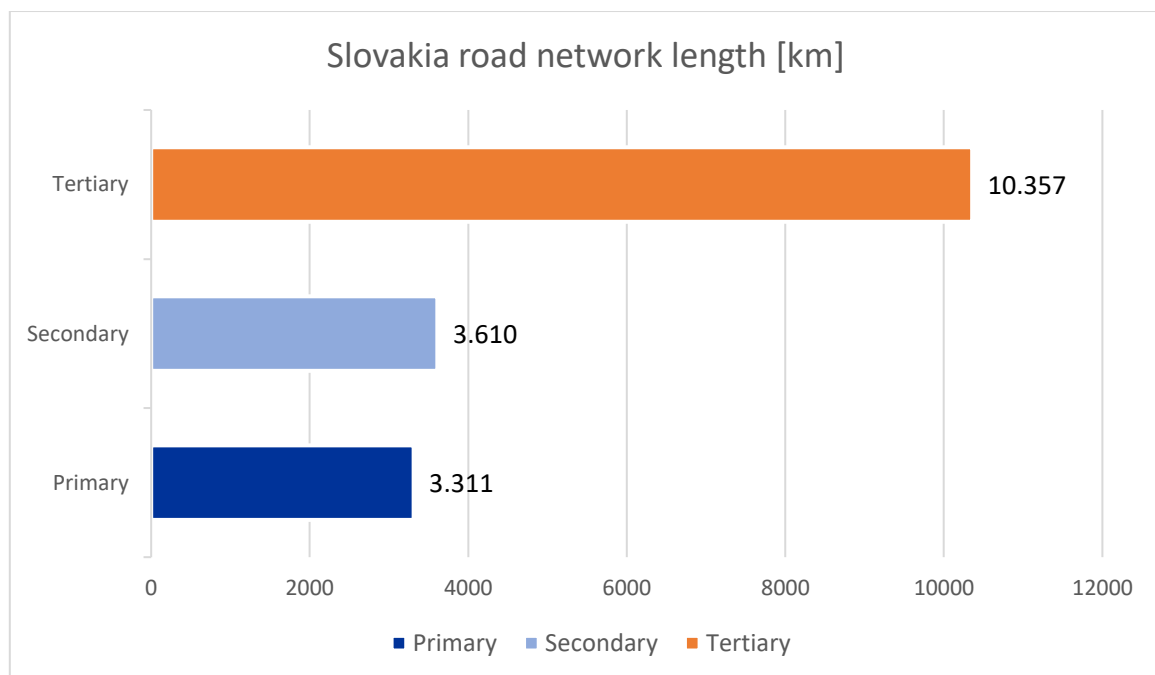


Figure 28 Road network length in Slovakia

Figure 28. shows the ratios of primary, secondary and tertiary roads in Slovakia (2017). As can be seen, the most common roads in Slovakia are tertiary roads with 10.357km, followed by secondary roads with 3.610 km and primary roads with 3.311 km.

¹⁸ <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/lo.html>

2.10.1.2 Crash data

Crash data of Slovakia (2017)	
Number of fatalities	250
Vehicle occupant fatalities	157
Cyclist fatalities	18
Pedestrian fatalities	49
Motorcycle fatalities	26
Number of injuries	1,127
Fatalities / Mio. population	57

Table 19 Accident data of Slovakia

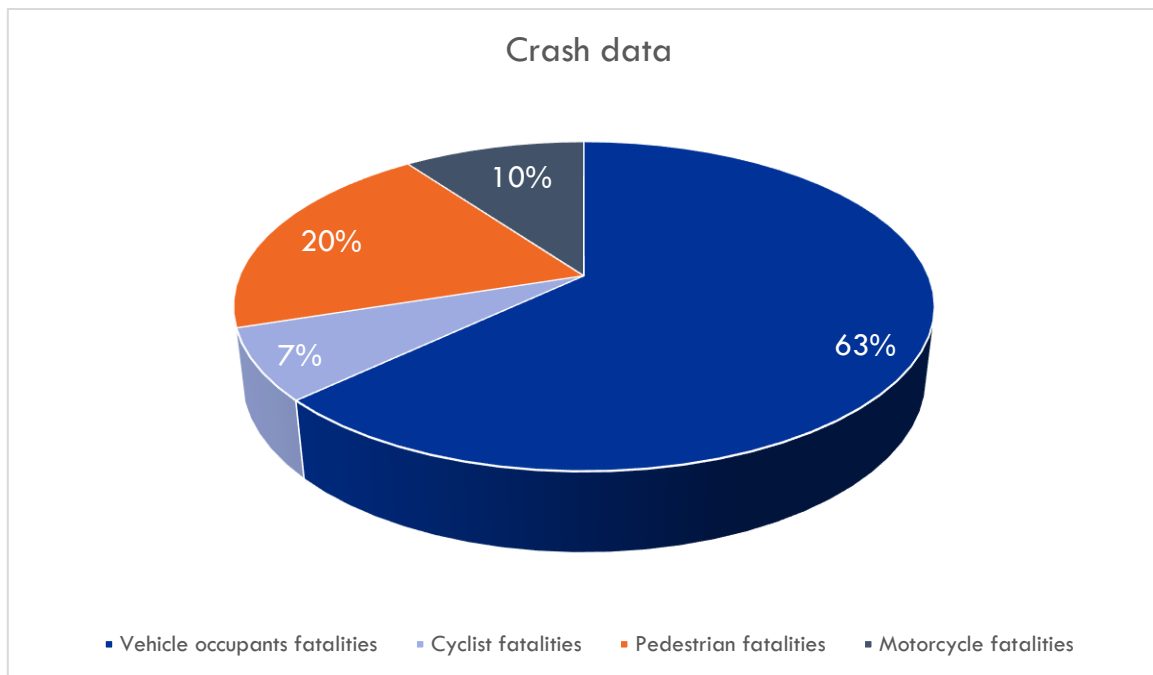


Figure 29 Crash data of Slovakia

Figure 29. shows the ratios of various types of accidents in Slovakia. Most common are vehicle occupants fatalities (157), followed by pedestrian fatalities (49), motorcycle fatalities (26) and cyclist fatalities (18).

2.10.1.3 Speed limits

Motorways: 130 km/h.

Expressways: 130 km/h (Inter-urban motorways/expressways: 90 km/h).

Outside inhabited places: 90 km/h.

Within inhabited places-primary: 50 km/h.

Within inhabited places-secondary: 50 km/h.

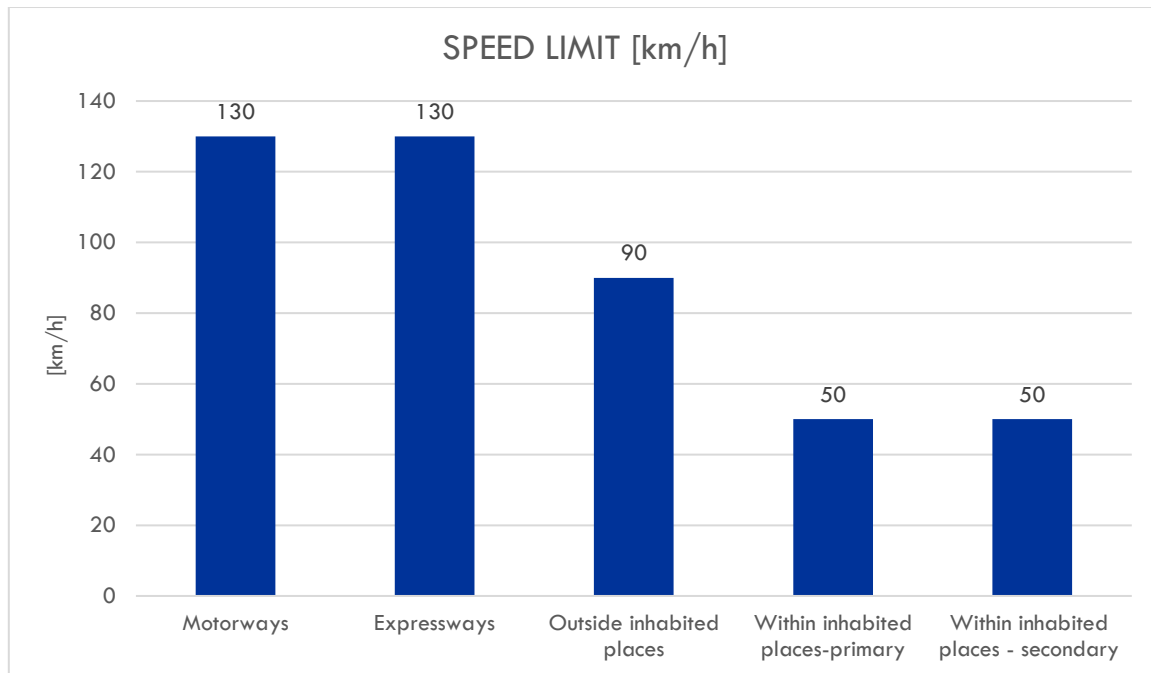


Figure 30 Speed limits in Slovakia

Figure 30. shows speed limits in Slovakia.

2.10.2. National Road Safety Strategy

There is National road safety strategy in operation (2011-2020).

2.10.2.1 Targets

Decreasing the number of fatalities by 50% between 2011 and 2020.¹⁹

2.10.2.2 Road safety budget

There is budget for road safety, but it is not exactly specified.

2.10.2.3 Road safety funds

There are dedicated road safety funds (no precise data).

¹⁹https://ec.europa.eu/transport/road_safety/sites/roadsafety/files/erso-country-overview-2016-slovakia_en.pdf

2.10.2.4 Road Safety Agency and road safety departments with authorities

There is organisation called “BECEP” dealing with some road safety issues in Slovakia, it is a part of the Ministry of Transport. It is mainly oriented to different promotional projects.

2.10.3. Infrastructure Safety Management

2.10.3.1 Implementation of the Infrastructure Safety Directive (2008/96/EC)

Slovakia has fully implemented the European Infrastructure Safety Directive. This goes for all mechanisms mentioned in the Directive: RSIA, NWRSM, RSI, RSA.

2.10.3.2 Competences per road categories

Responsibilities for operation, development & reconstruction and maintenance of roads lies with the following authorities:

Competences per road categories of Slovakia	
Primary-motorways	National Motorway Company
Primary-other	Slovak Road Administration
Secondary	Local municipalities
Tertiary	Local municipalities

Table 20 Competences per road categories of Slovakia

2.10.3.3 Priorities for assessing sections or roads for improvement

Assessing of hot spots, crash clusters or black spots.

2.10.3.4 Identification of high-risk sites

The “black spot methodology” has been used for identifying the high-risk sites by the Slovak Road Administration for decades.

2.10.3.5 In-depth crash analysis

It is based on experts opinion.

2.10.3.6 Data availability: Speed levels

Data for primary and secondary network are available.

2.10.3.7 Use of digital crash maps and road databases

Slovakia has detailed road databases. There are no actual digital crash maps available since 2014.

2.10.3.8 Data availability: AADT

Data are available for whole road network.

2.10.3.9 EuroRAP/iRAP Star Rating methodology

Slovakia has data for 942 km of roads that have been collected using EuroRAP/iRAP Star rating methodology.

2.10.4. Facilities for VRUs

2.10.4.1 Pedestrians and cyclists

There is no infrastructure for the safe movement of pedestrians and cyclists on primary and secondary roads.

2.10.4.2 Motorcyclists

There is no specific infrastructure for the safe movement of motorcyclists.

3. Comparative Analysis

Here are some comparisons that serve the objectives of this report (training curriculum, tailor-made for target audience and – country).

3.1. General data

3.1.1. Road network length

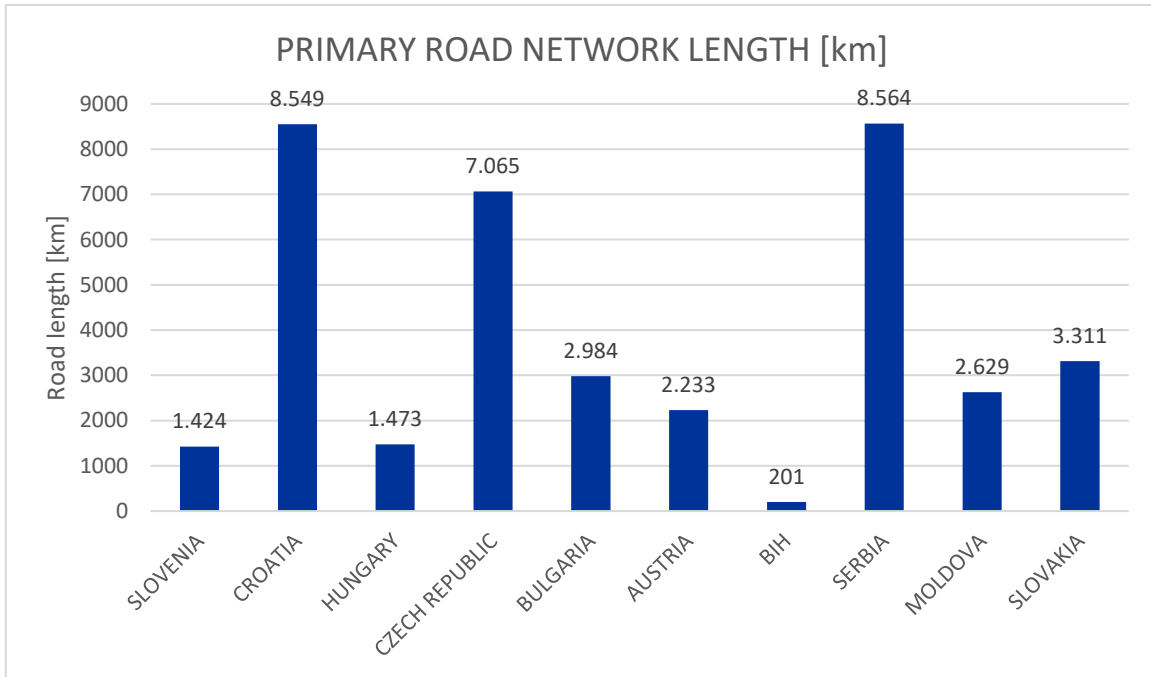


Figure 31 Length of primary road network by country

Figure 31. shows the length of primary road networks of countries included in the Radar project. As can be seen on this figure, Serbia is the country that has the longest primary road network with 8.564 km of roads, followed by Croatia with 8.549 km. Czech Republic has 7.065 km, Slovakia 3.311 km, Bulgaria 2.984 km, Moldova 2.629 km, Austria 2.233 km, Hungary 1.473 km, Slovenia 1.424 km and BiH 201km of primary road network.

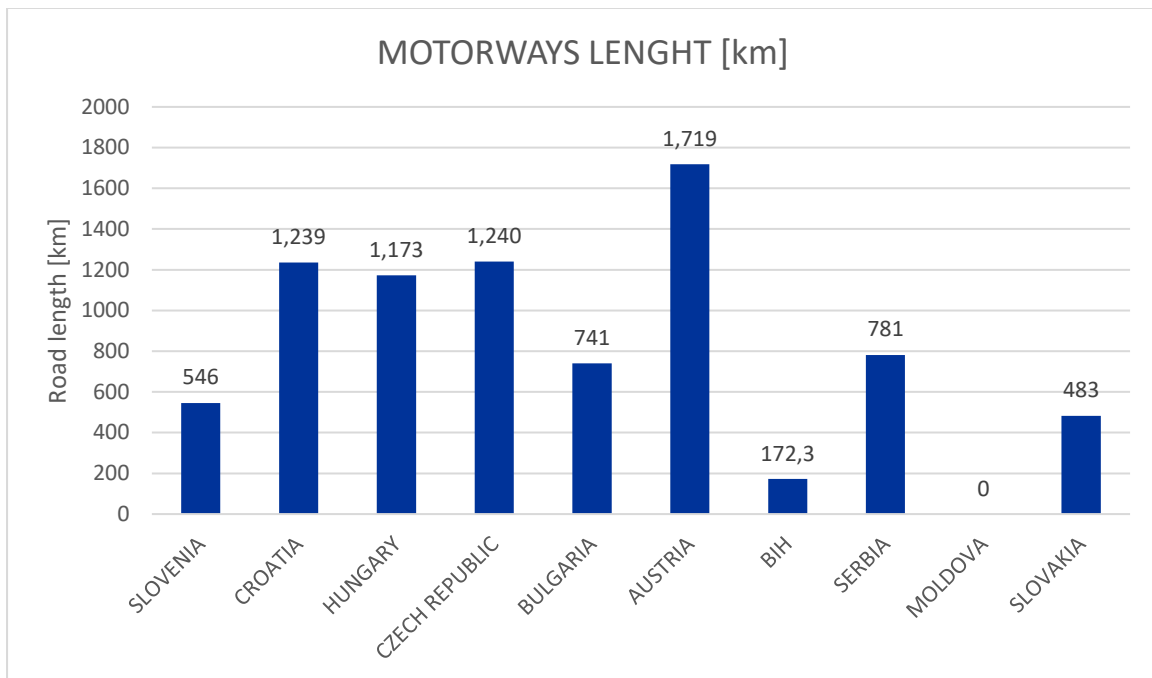


Figure 32 Length of motorways by country

Figure 32. shows the length of motorways of countries included in the Radar project. As can be seen, Austria has the longest network of motorways with 1.719 km. On the other side, Moldova has no motorways.

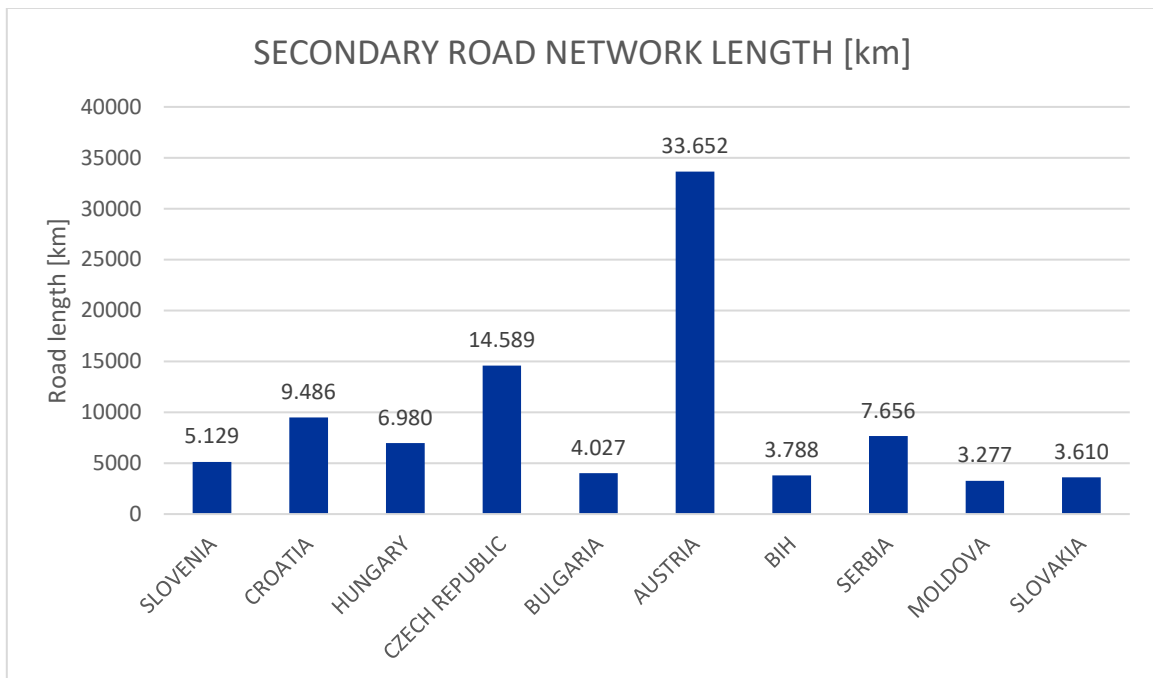


Figure 33 Length of secondary road network by country

Figure 33. shows the length of secondary road network of countries included in the Radar project. As can be seen, Austria is the country that has the longest secondary road network with 33.652 km of roads, followed by Czech Republic with 14.589 km and Croatia with 9.486 km. Serbia has 7.656 km, Hungary 6.980 km, Slovenia 5.129 km, Bulgaria 4.027 km, BiH 3.788 km, Slovakia 3.610 km and Moldova 3.277 km of Secondary Road Network.

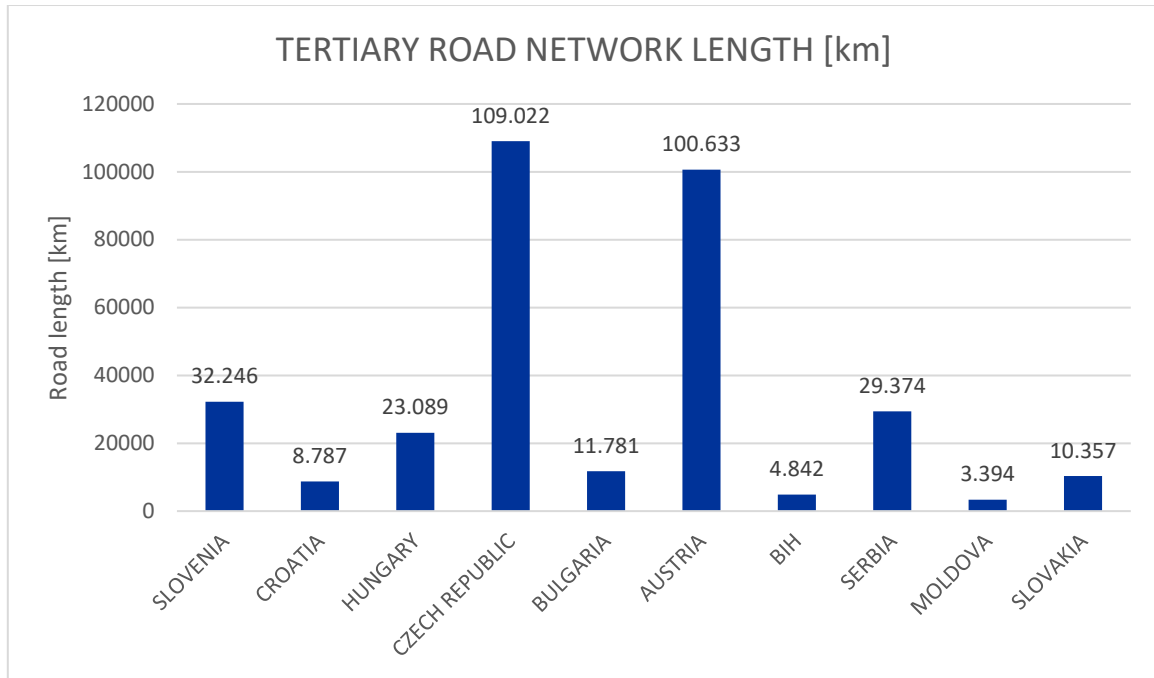


Figure 34 Length of tertiary road network by country

Figure 34. shows the length of tertiary road network of countries included in the RADAR project. As can be seen, the Czech Republic is the country that has the longest tertiary road network with 109.022 km of roads followed by Austria with 100.633 km and Slovenia with 32.246 km. Serbia has 29.374 km, Hungary 23.089 km, Bulgaria 11.781 km, Slovakia 10.357 km, Croatia 8.787 km, BiH 4.842 km and Moldova 3.394 km of tertiary road network.

3.1.2. Road network density (km per 100 sq km)

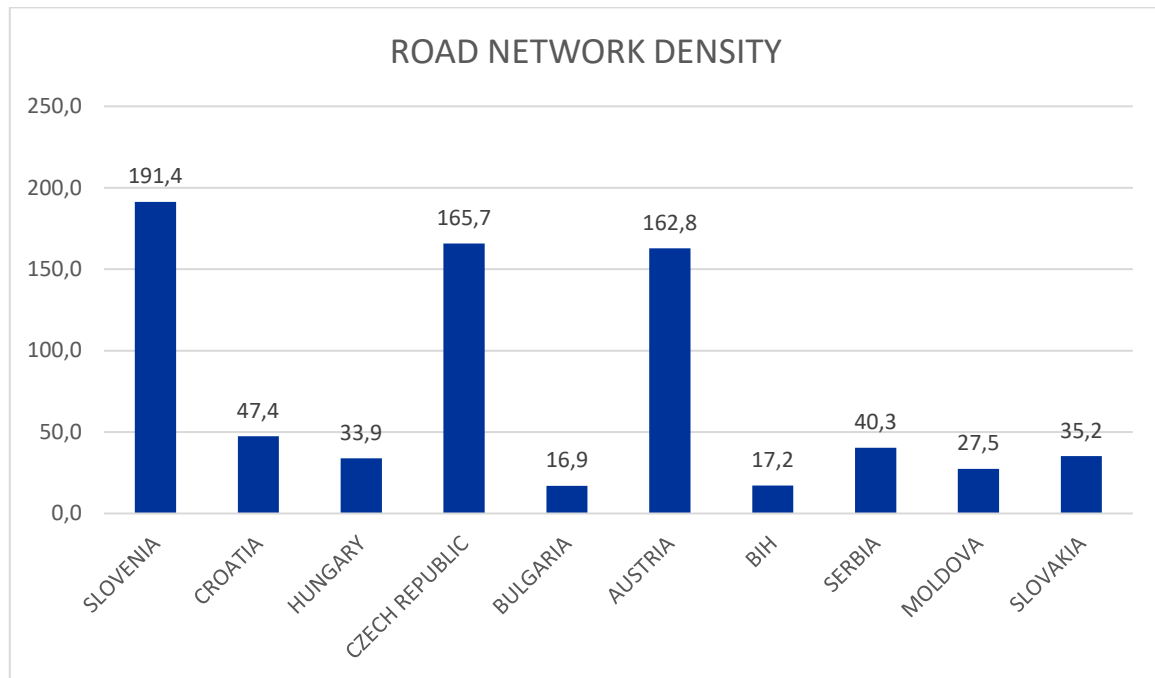


Figure 35 Road Network density by country

Figure 35. shows the density of total (primary, secondary and tertiary) road network of Countries included in the RADAR project. As can be seen, Slovenia is the country that has the densest road network with 191.4 km of roads per 100 square km. Bulgaria is at the bottom, with 16.9 km of roads per 100 square km.

3.1.3. Crash data

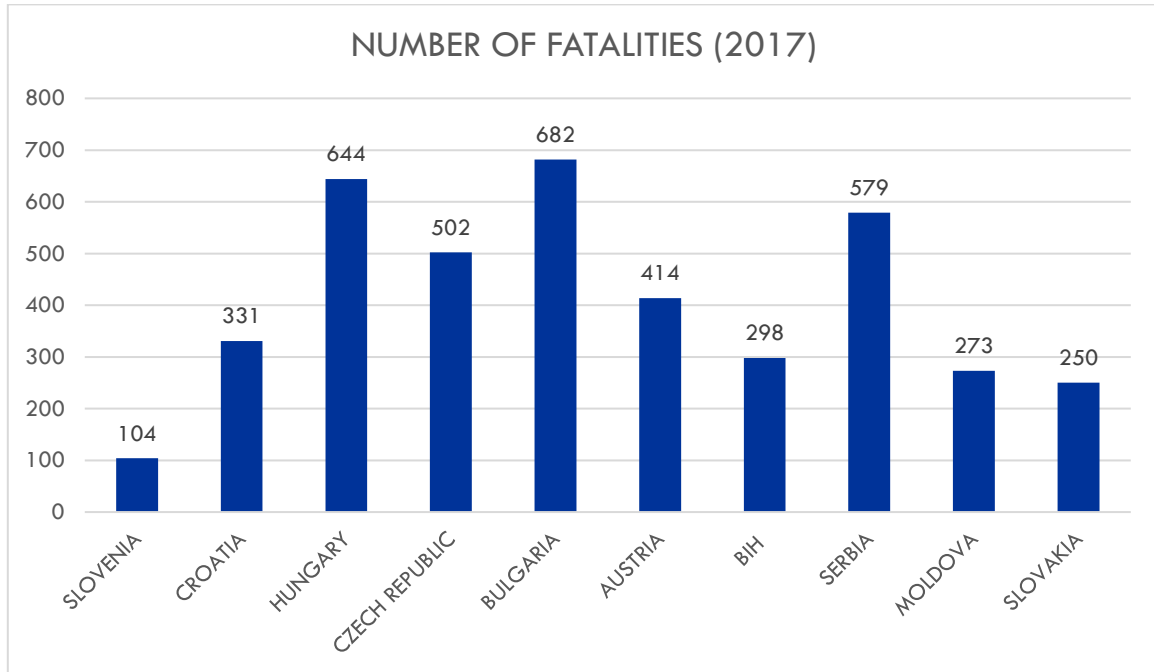


Figure 36 Number of fatalities by country

Figure 36. shows number of fatalities that occurred in each country in year 2017, except Hungary in year 2015. As can be seen, Slovenia is the country that had the least number of fatalities, only 104. Bulgaria is, on the other hand, the country that had the largest number of fatalities 682.

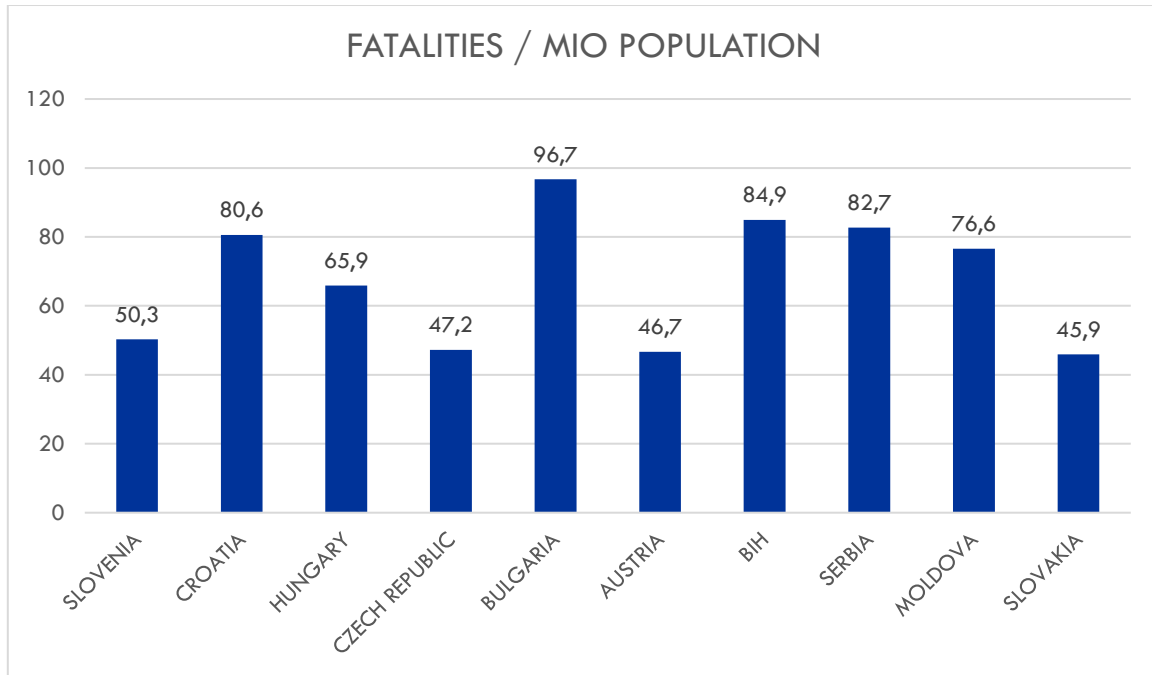


Figure 37 Fatalities per 1 000 000 population by country

Figure 37. shows relative number of fatalities that occurred in each country in relation to 1,000,000 of population. The figure shows that Bulgaria is the worst performing country with 96.7, where the Czech Republic, Austria and Slovakia are, on the other hand, the countries that had the lowest number of fatalities per 1,000,000 population, i.e. 47.2, 46.7 and 45.9, respectively.

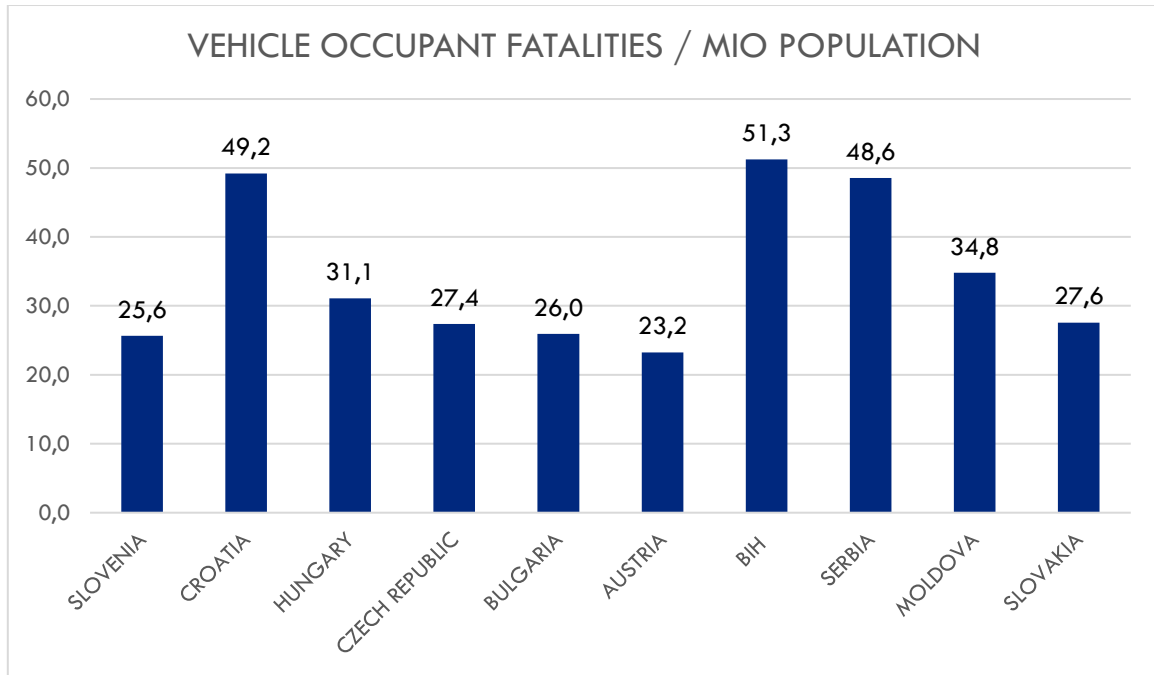


Figure 38 Vehicle occupant fatalities per 1,000,000 population by country

Figure 38. shows relative number of vehicle occupant fatalities that occurred in each country in relation to 1,000,000 of population. As can be seen, Austria is the country that had the least vehicle occupant fatalities, only 23.2. BiH is, on the other hand, the country that had the largest number of vehicle occupant fatalities, 51.3.

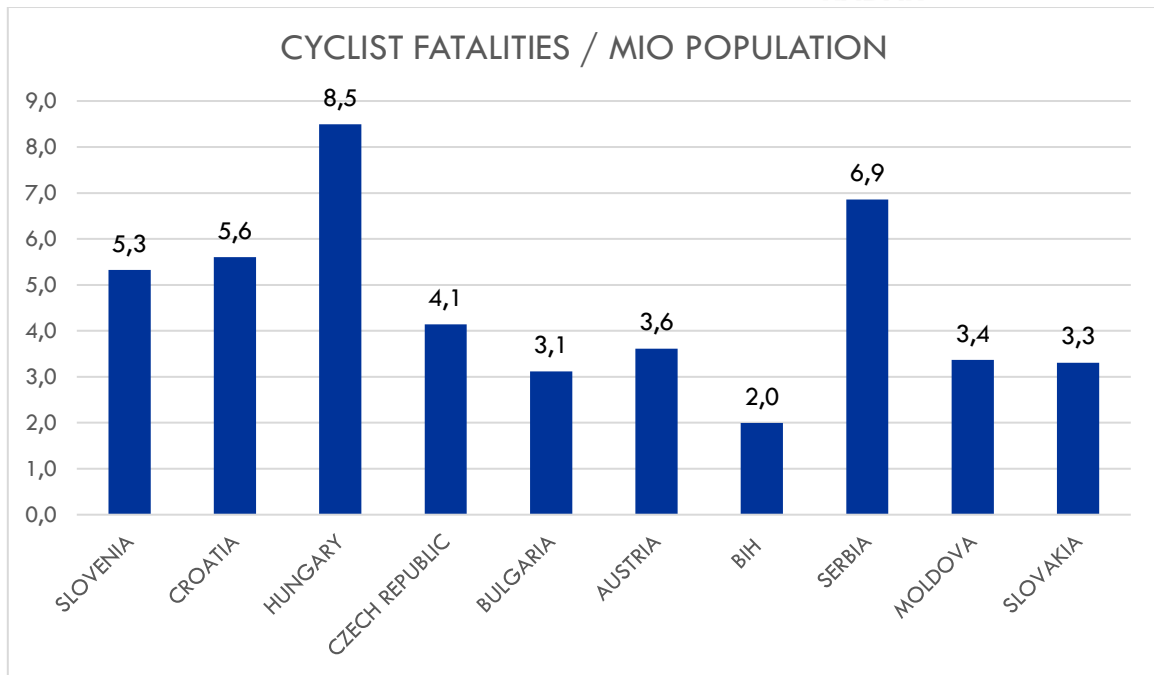


Figure 39 Cyclist fatalities per 1,000,000 population by country

Figure 39. shows relative number of cyclist fatalities that occurred in each country in relation to 1,000,000 of population. As can be seen, Bosnia and Herzegovina is the country that had the least cyclist fatalities, only 2. Hungary is, on the other hand, the country that had the largest number of cyclist fatalities, 8.5.

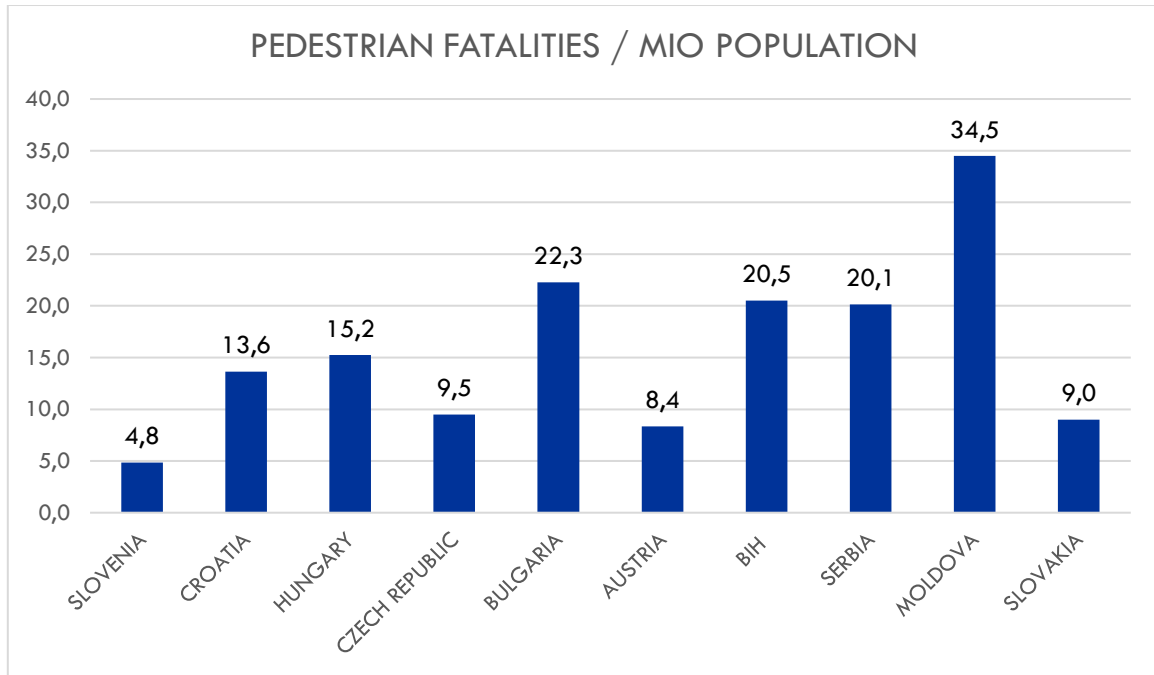


Figure 40 Pedestrian fatalities per 1,000,000 population by country

Figure 40. shows relative number of pedestrian fatalities that occurred in each country in relation to 1,000,000 of population. The figure shows that Slovenia is the country that had the least pedestrian fatalities, only 4.8. Moldova is, on the other hand, the country that had the largest number of pedestrian fatalities, 34.5.

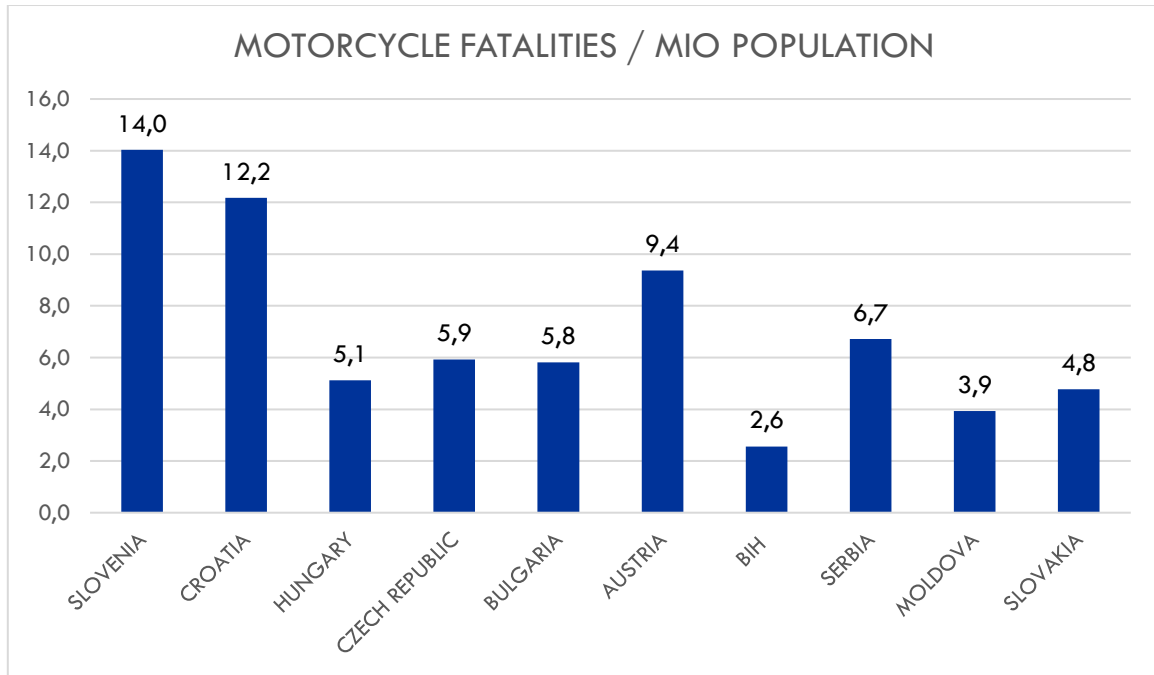


Figure 41 Motorcycle fatalities per 1,000,000 population by country

Figure 41. shows relative number of motorcycle fatalities that occurred in each country in relation to 1,000,000 of population. As can be seen, Bosnia and Herzegovina is the country that had the least motorcycle fatalities, only 2.6. Slovenia is, on the other hand, the country that had the largest number of motorcycle fatalities, 14.

3.1.4. Speed limits

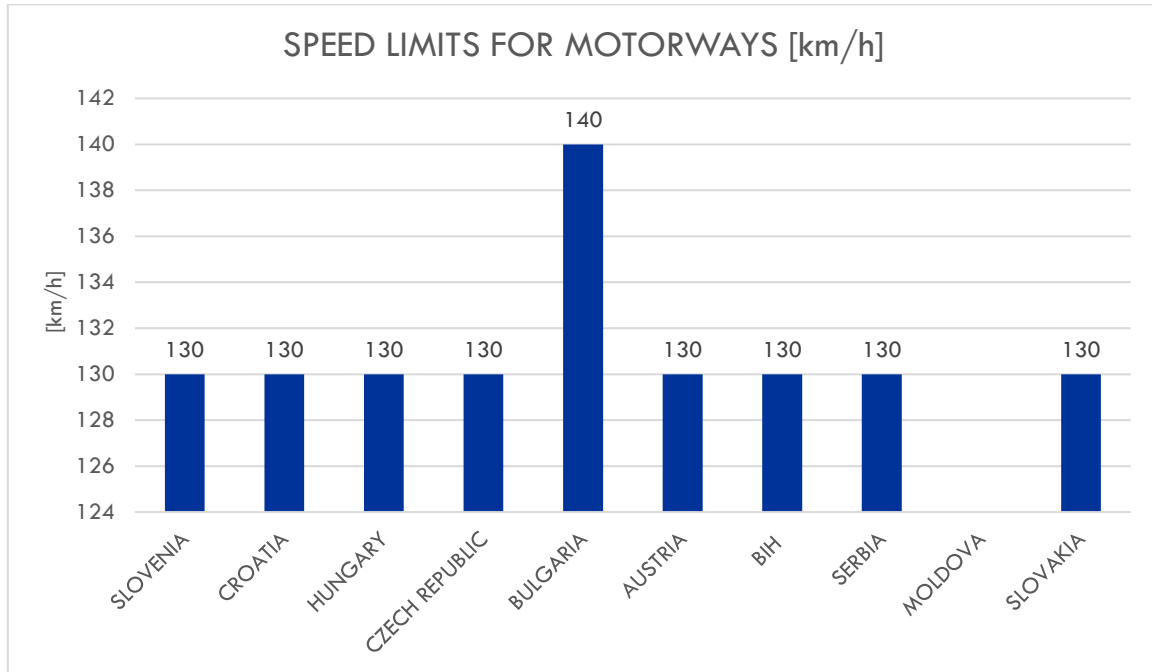


Figure 42 Speed limits for motorways by country

Figure 42. shows speed limits for motorways in each country. Bulgaria is the only country with speed limit for motorways of 140 km/h. All other countries have the same speed limit for motorways 130 kmh.

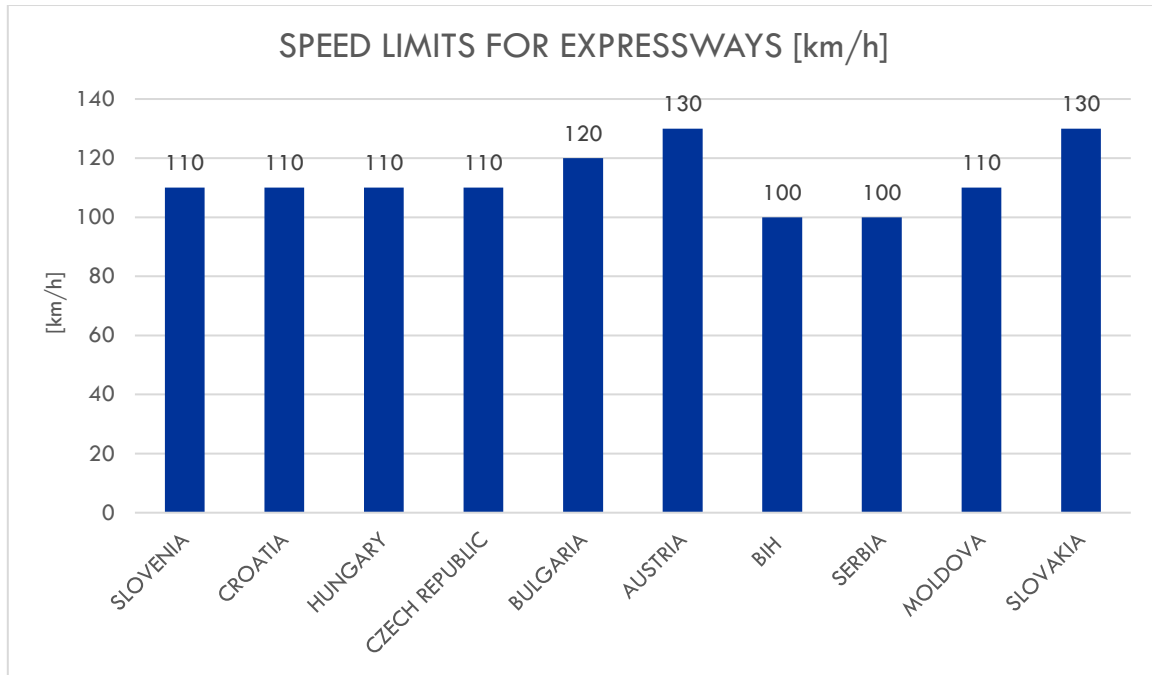


Figure 43 Speed limits for expressways by country

Figure 43. shows speed limits for expressways for each country. What can be seen is that Slovenia, Croatia, Hungary, Moldova and Czech Republic have speed limit of 110km/h. Austria and Slovakia have speed limit of 130 km/h, Bulgaria 120 km/h, Serbia and Bosnia and Herzegovina 100 km/h.

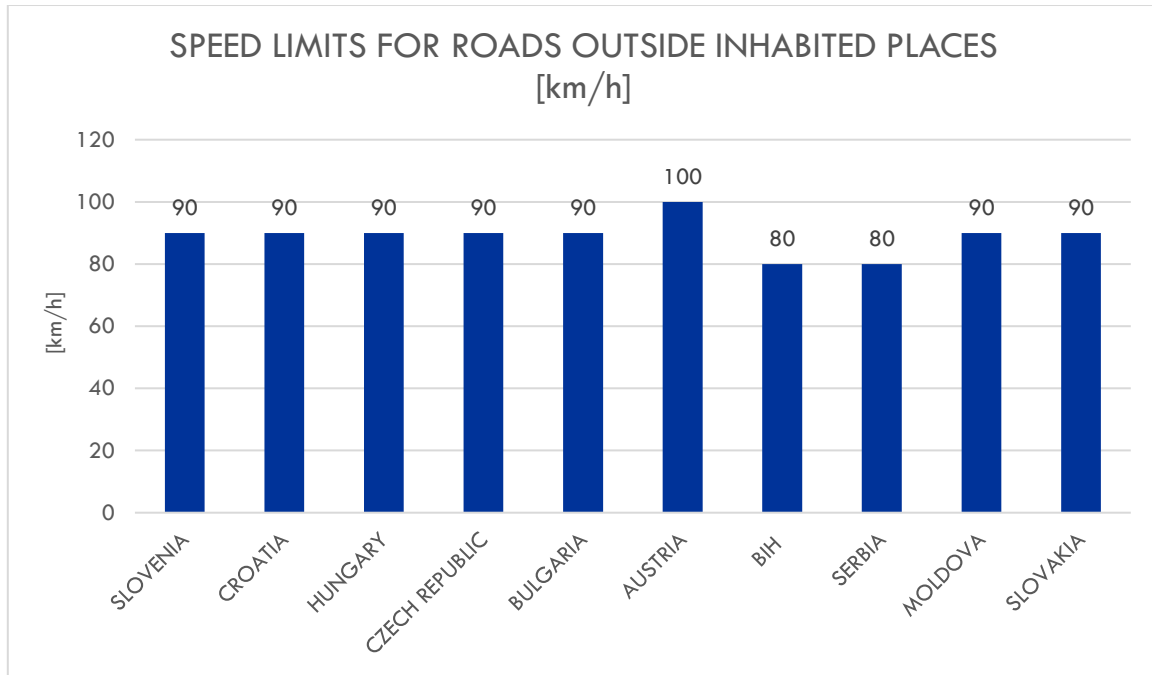


Figure 44 Speed limits for roads outside inhabited places by country

Figure 44. shows speed limits for roads outside inhabited places, for each country. What can be seen is that Slovenia, Croatia, Hungary, Slovakia, Bulgaria, Moldova and Czech Republic have speed limit of 90 km/h. Bosnia and Herzegovina and Serbia have speed limit of 80 km/h. Austria has speed limit of 100 km/h.

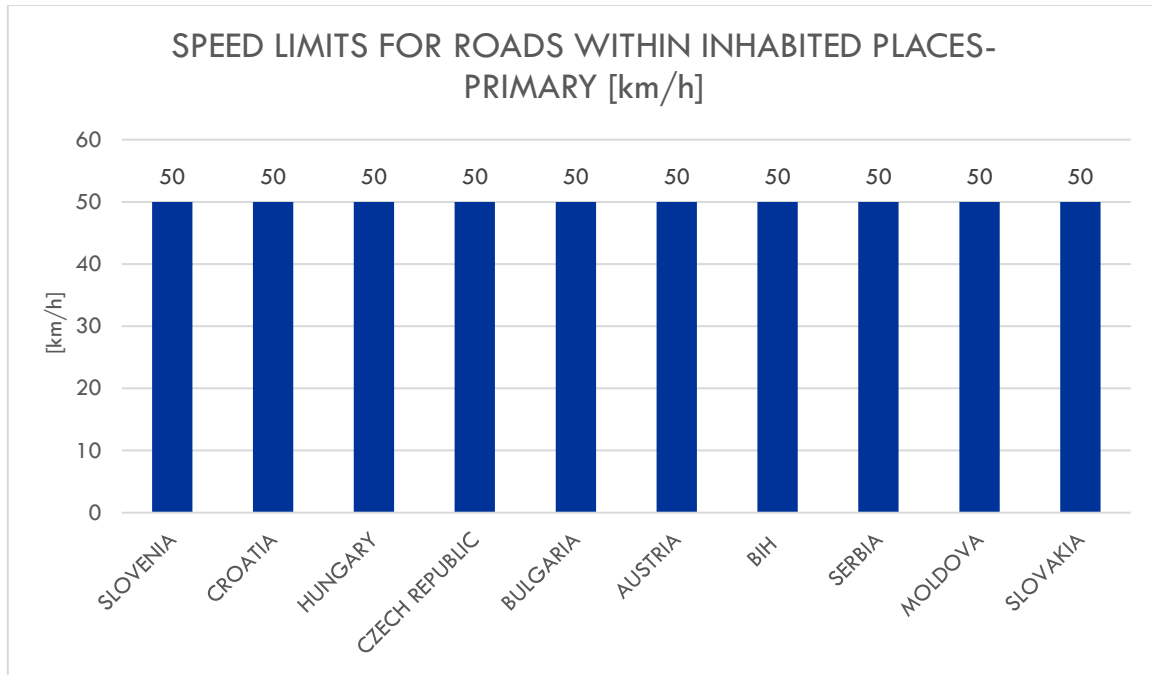


Figure 45 Speed limits for roads within inhabited places-primary by country

Figure 45. shows speed limits for each country for roads within inhabited places – primary. What can be seen is that all countries have speed limit of 50 km/h.

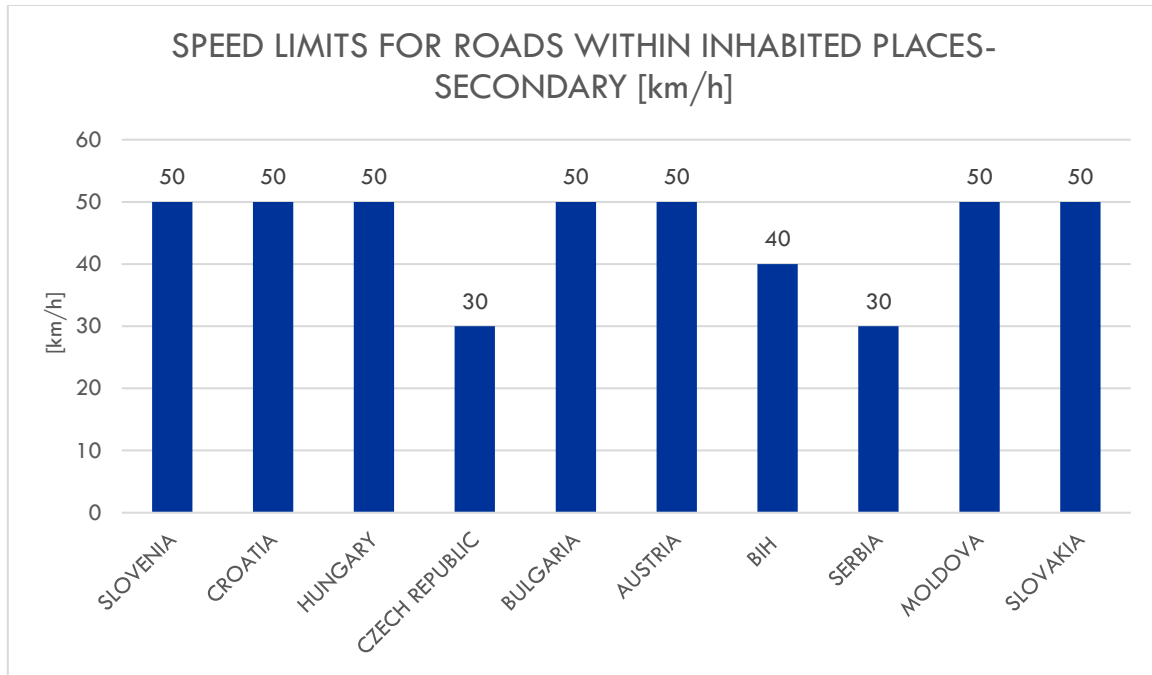


Figure 46 Speed limits for roads within inhabited places-secondary by country

Figure 46. shows speed limits by each country for roads within inhabited places – secondary. What can be seen is that Austria, Slovenia, Croatia, Hungary, Slovakia, Bulgaria and Moldova have speed limit of 50 km/h. Serbia and Czech Republic have speed limit of 30 km/h and Bosnia and Herzegovina has speed limit of 40 km/h.

3.2. National Road Safety Strategy

3.2.1. National fatality targets

National fatality targets				
	Fatality target by 2020*		Severely injured target by 2020*	
	Number of fatalities per mil. inhabitants	Fatality reduction percentage	Number of severely injured per mil. inhabitants	Severely injured reduction percentage
Slovenia	35		230	
Croatia	51	50%	No target set	No target set
Hungary	38	50%	No data	50%
Czech Republic	34	60%	197	40%
Bulgaria	55	50%	896	20%
Austria	35	50%	610	40%
BIH	30	50%	No target set	No target set
Serbia	47	50%	276	50%
Moldova	64	50%	No data	50%
Slovakia	34	50%	No target set	No target set

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Table 21 National fatality targets by country

Table 21. represents the targets of the mentioned countries in terms of reducing the number of both fatalities and seriously injured in road accidents. Reducing the number of fatalities and serious injuries is a target set for the period 2011-2020, with exceptions of Slovenia (which has a target set for the period 2013-2022), and the Czech Republic (which has a target set for the period 2009-2020).

Slovenia has set the target by 2022 to reduce the number of fatally injured in road traffic per million inhabitants so that it does not exceed 35. It also set a target to reduce the number of seriously injured, by 2022, not exceeding 230 per million inhabitants.

In 2010, Croatia had 426 fatally injured and set its target to reduce this number by 50%, by 2020, meaning that by 2020, the number of people killed in road traffic in Croatia per million inhabitants should not exceed 51. Croatia has set no goals to reduce serious road injuries.

In 2010, there were 740 people fatalities in Hungary, after which a target was set to reduce this number by 50%, by 2020. It means that, by 2020, the number of fatal injuries per million inhabitants should not exceed 38. There is no data available for seriously injured in Hungary.

In 2008, 900 fatalities were reported in the Czech Republic. The goal the Czech Republic set is to reduce this number by 60%, by 2020, meaning that, by 2020, the number of people killed in road crashes in the Czech Republic per million inhabitants should not exceed 34. Likewise, the target is to reduce the number of seriously injured in road traffic (3,467 in 2008) by 40%, by 2020. It means that, by 2020, the targeted number of seriously injured per million inhabitants should not exceed 197.

In 2010, Bulgaria had 775 fatally injured, and 7,954 seriously injured in road traffic. Its goal is to halve the number of fatalities by 2020, which means that by 2020, the number of people killed in road traffic in Bulgaria, per million inhabitants, should not exceed 55, and the number of seriously injured should not exceed 896.

In the period from 2008 to 2010, Austria had 622 fatally injured and 8,923 seriously injured in road crashes. Its goal is to reduce the number of road fatalities by 50% by 2020, which means that by 2020, the target number should not exceed 35 road fatalities per million inhabitants. Austria also aims to reduce the number of seriously injured in road traffic by 40%, by 2020, which means that by 2020, the target number of seriously injured should not exceed 610 per million inhabitants.

In 2010, BiH had 208 road fatalities reported and its target is to halve that number by 2020, meaning that by 2020, the number of people killed in road traffic in BiH per million inhabitants should not exceed 30. BiH has no goal set to reduce seriously injured in road traffic.

In 2010, Serbia had 660 road fatalities, and a goal has been set to reduce that number by 50%, by 2020. It means that by 2020, the number of people killed in road crashes in Serbia per million inhabitants should not exceed 47. Serbia has also set a target to reduce the number of serious road injuries (3,883 in 2010) by 50%, by 2020, meaning that by 2020, the target number of seriously injured per million inhabitants does not exceed the number of 276.

In 2010, Moldova had 452 road fatalities and a target has been set to reduce that number by 50% by 2020, meaning that by 2020, the number of people killed in road traffic in Moldova per million inhabitants should not exceed 64. Moldova has no data on seriously injured in road traffic.

In 2010, Slovakia had 452 road fatalities reported. A target has been set to halve that number by 2020. It means that by 2020, the number of people killed on Slovakian roads, per million inhabitants, should not exceed 34. Slovakia has set no goals to reduce the number of seriously injured in road traffic.

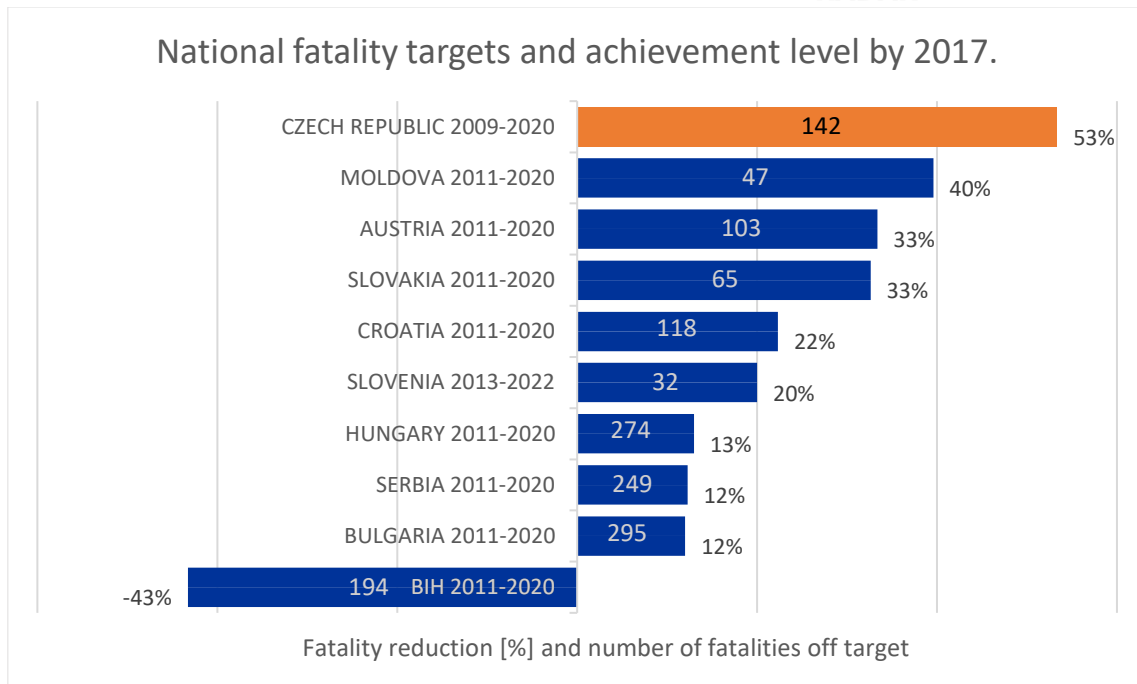


Figure 47 National fatality targets and achievement level by 2017.

Figure 47 shows the reductions in road fatalities by 2017. The Czech Republic already achieved its 2020 fatality reduction target in 2017. Moldova follows with a reduction in fatally injured in road crashes by 40%, by 2017. Austria and Slovakia reduced their fatally injured by 33%. Croatia and Slovenia reduced the number of road fatalities by 22% and 20%, respectively. Hungary, Serbia and Bulgaria lowered the number of road deaths by 13%, 12% and 12%, respectively. BiH, however, accounts for an increased number of road fatalities by 43%.

3.2.2. Policy

Policy on crash reduction approach	
Slovenia	✓
Croatia	✓
Hungary	x
Czech Republic	✓
Bulgaria	✓
Austria	✓
BIH	x
Serbia	✓
Moldova	✓
Slovakia	✓

Table 22 Policy on crash reduction approach

Table 22. shows whether the countries concerned have a crash reduction approach policy. It can be noticed that all the countries, with the exception of Hungary and Bosnia and Herzegovina, have their own crash reduction approach policies.

3.2.3. Road safety budgets

Availability of road safety budget	
Slovenia	✓
Croatia	✓
Hungary	✓
Czech Republic	✓
Bulgaria	✗
Austria	✗
BIH	✓
Serbia	✓
Moldova	✗
Slovakia	✓

Table 23 Availability of road safety budget

Table 23. shows the countries having specifically allocated budgets for road safety activities, and interventions from the national budget. It can be noticed that in all countries, apart from Austria, Bulgaria and Moldova, there are dedicated road safety budgets available for road safety.

3.2.4. Road safety funds

Dedicated road safety funds	
Slovenia	✓
Croatia	✓
Hungary	✓
Czech Republic	✓
Bulgaria	✗
Austria	✓
BIH	✓
Serbia	✓
Moldova	✗
Slovakia	✓

Table 24 Dedicated road safety funds by country

Table 24. shows availability of road safety funds in each country. With the exception of Bulgaria and Moldova, there are road safety funds in all other countries concerned.

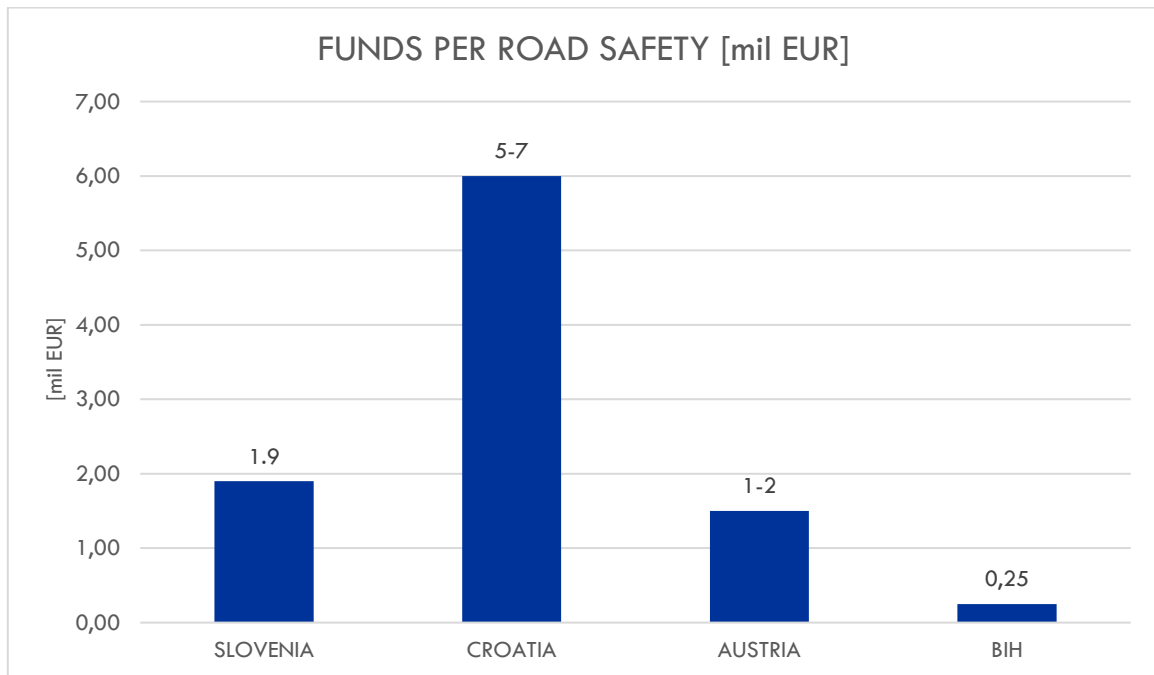


Figure 48 Funds for road safety by country

Only four countries reported details of available road safety funds: Austria has 1-2 million €, Slovenia 1,9 million €, Croatia 5-7 million € and Bosnia and Herzegovina 0,25 million €.

3.2.5. Evaluations

Evaluation of effectiveness of use of funds for road safety	
Slovenia	✓
Croatia	✓
Hungary	✗
Czech Republic	✓
Bulgaria	✗
Austria	✗
BIH	✗
Serbia	✓
Moldova	✗
Slovakia	✓

Table 25 Effectiveness of use of funds for road safety by country

Table 25. shows whether the countries concerned evaluate the effectiveness of use of road safety funds. It can be seen that the Czech Republic, Slovakia, Serbia, Croatia and Slovenia are countries that have reported that evaluations are made in terms of use of road safety funds.

3.2.6. Road Safety Agency and Road Safety departments with authorities

Road safety agency	
Slovenia	✓
Croatia	✗
Hungary	✗
Czech Republic	✗
Bulgaria	✗
Austria	✗
BIH	✗
Serbia	✓
Moldova	✗
Slovakia	✗

Table 26 Road Safety Agency by country

Table 26. shows established road safety agencies and activities related to road infrastructure safety. What can be seen is that only Serbia, Slovakia and Slovenia have road safety agencies. All other countries do not have such authorities.

3.3. Infrastructure Safety Management

3.3.1. Implementation of the Infrastructure Safety Directive (2008/96/EC)

Infrastructure safety directive (2008/96/EC)	
Slovenia	✓
Croatia	✓
Hungary	✓
Czech Republic	✓
Bulgaria	✓
Austria	✓
BIH	✓
Serbia	✓
Moldova	✓
Slovakia	✓

Table 27 Infrastructure Safety Directive (98/2008/EC)

Table 27. shows which countries have implemented Infrastructure Safety Directive (2008/96/EC). What can be seen is that all countries have implemented Infrastructure Safety Directive (2008/96/EC). This issue will be assessed in more detail in the later stages of the RADAR project.

3.3.2. Applied road infrastructure standard

Applied road infrastructure standard	
Slovenia	✓
Croatia	✓
Hungary	✓
Czech Republic	✓
Bulgaria	✓
Austria	✓
BIH	✓
Serbia	✓
Moldova	✓
Slovakia	✓

Table 28 Applied safety standard for road infrastructure by country

Table 28. shows inclusion of safety standards in infrastructure design. What can be seen is that all countries do apply safety standards for road infrastructure. This issue will also be assessed more fully in later parts of the RADAR project.

3.3.3. Procedures for Network-wide road safety assessment (NWRSA), Road Safety Impact Assessment (RSIA), Road Safety Inspection (RSI) and Road Safety Audit (RSA)

Presence of applied procedures				
	NWRSA	RSIA	RSI	RSA
Slovenia	✓	✓	✓	✓
Croatia	✓	✓	✓	✓
Hungary	✓	✓	✓	✓
Czech Republic	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓
Austria	✓	✓	✓	✓
BIH	x	x	x	x
Serbia	x	x	✓	✓
Moldova	x	x	x	x
Slovakia	✓	✓	✓	✓

Table 29 Presence of NWRSA / RSIA / RSI / RSA by country

Table 29. shows the countries applying respective infrastructure safety management procedures: Network-wide Road Safety Assessment, Road Safety Impact Assessment, Road Safety Inspection or Road Safety Audit. It can be noticed that all the countries, with the exception of Bosnia and Herzegovina, Serbia and Moldova, apply the Network-wide Road Safety Assessment and Road Safety Impact Assessment. Also, all countries, except for Bosnia and Herzegovina and Moldova, apply Road Safety Inspection or Road Safety Audit.

3.3.4. Competences per road categories

Competences per road categories – primary roads				
	National Authorities	Regional Authorities	Local	Local Municipalities
Slovenia	✓	×	×	×
Croatia	✓	×	×	×
Hungary	✓	×	×	×
Czech Republic	✓	×	×	×
Bulgaria	✓	×	×	×
Austria	✓	×	×	×
BIH	✓	×	×	×
Serbia	✓	×	×	×
Moldova	✓	×	×	×
Slovakia	✓	×	×	×

Table 30 Primary road competences by country

Table 30. shows primary road competences in each country. It can be noticed that in all countries, national authorities have competences over primary roads.

Competences per road categories – secondary roads				
	National Authorities	Regional Authorities	Local	Local Municipalities
Slovenia	x	✓	x	x
Croatia	x	x	✓	x
Hungary	✓	x	x	x
Czech Republic	x	x	✓	x
Bulgaria	✓	x	x	x
Austria	x	✓	x	x
BIH	x	x	✓	x
Serbia	x	x	x	✓
Moldova	x	x	✓	x
Slovakia	x	x	x	✓

Table 31 Secondary road competences by country

Table 31. shows Secondary road competences in each country. It can be noticed that in Hungary and Bulgaria, national authorities have competences over secondary roads. In Austria and Slovenia, regional authorities have competences over secondary roads. In Croatia, Bosnia and Herzegovina, Moldova and the Czech Republic, local authorities are in charge of secondary roads. In Serbia and Slovakia, local municipalities have competences over secondary roads.

Competences per road categories – tertiary roads				
	National Authorities	Regional Authorities	Local	Local Municipalities
Slovenia	x	x	x	✓
Croatia	x	x	x	✓
Hungary	x	x	x	✓
Czech Republic	x	x	✓	x
Bulgaria	✓	x	x	x
Austria	x	x	x	✓
BIH	x	x	x	✓
Serbia	x	x	x	✓
Moldova	x	x	x	✓
Slovakia	x	x	x	✓

Table 32 Tertiary road competences by country

Table 32. shows tertiary road competences in each country. In Bulgaria, national authorities have competences over tertiary roads. In the Czech Republic, local authorities are in charge of tertiary roads, and in Austria, Slovenia, Croatia, Hungary, Bosnia and Herzegovina, Serbia, Slovakia and Moldova, tertiary roads fall under jurisdiction of local municipalities.

3.3.5. Priorities for assessing sections or roads for improvement

Priorities for assessing sections or roads for improvements			
	Hot spots, BSM, crash clusters	Route assessment	Whole network improvement
Slovenia	x	x	✓
Croatia	x	x	✓
Hungary	✓	x	x
Czech Republic	✓	x	✓
Bulgaria	✓	x	x
Austria	✓	x	x
BIH	✓	x	x
Serbia	x	x	✓
Moldova	x	✓	x
Slovakia	✓	x	x

Table 33 Priorities for assessing sections or roads for improvements by country

Table 33. shows the priorities the country have in assessing the sections or roads for improvements. It can be noticed that Austria, Hungary, Bosnia and Herzegovina, Slovakia, Bulgaria and the Czech Republic prioritize Hot spots, BSM and crash clusters. Moldova's priority is Route assessment, while Slovenia, Croatia and Serbia prioritize the whole network for improvement.

Priorities for assessing sections or roads for improvement include:

- assessing hot spots, crash clusters or black spots
- assessing particular routes for improvement
- tackling crash types such as head-ons, intersection or run-off crashes
- looking at the whole network and trying to improve the standard of it all.

3.3.6. Identification of high-risk sites

	Accidents	Infrastructure
Slovenia	✓	x
Croatia	x	✓
Hungary	✓	x
Czech Republic	✓	x
Bulgaria	✓	x
Austria	✓	x
BIH	✓	x
Serbia	✓	x
Moldova	✓	x
Slovakia	✓	x

Table 34 Identification of high-risk sites by country

Table 34. shows the main focus each country has in identifying high-risk sites. As can be seen, Slovenia, Hungary, the Czech Republic, Bulgaria, Austria, Bosnia and Herzegovina, Serbia, Moldova and Slovakia focus on road accidents. The focus of Croatia is on its infrastructure.

3.3.7. In-depth crash analysis

In-depth crash analysis			
	Fatal accidents audit	Black spot management	Undefined
Slovenia	✓	x	x
Croatia	x	✓	x
Hungary	x	x	✓
Czech Republic	✓	x	x
Bulgaria	x	x	✓
Austria	x	x	✓
BIH	✓	x	x
Serbia	x	✓	x
Moldova	✓	x	x
Slovakia	x	✓	x

Table 35 In-depth crash analysis by country

Table 35. shows the most common methodology that each country uses for in-depth crash analysis. As can be seen, Slovenia, the Czech Republic, Bosnia and Herzegovina and Moldova use the Fatal accidents audit. Croatia, Serbia and Slovakia use Black spot management, while Hungary, Bulgaria and Austria do not have a most common methodology defined.

3.3.8. Use of digital crash maps and road databases

Use of digital crash maps and road databases	
Slovenia	✓
Croatia	✓
Hungary	✓
Czech Republic	✓
Bulgaria	✓
Austria	✓
BIH	x
Serbia	✓
Moldova	x
Slovakia	✓

Table 36 Use of digital maps and road databases by country

Table 36. shows which countries use digital maps and road database and which do not. What can be seen is that Moldova and Bosnia and Herzegovina do not use digital maps and road database. All the other countries make use of digital crash maps and road databases.

3.3.9. Data availability: Speed levels

Data availability per road category: speed levels			
	Primary	Secondary	Tertiary
Slovenia	✓	✓	✗
Croatia	✗	✗	✗
Hungary	✓	✓	✗
Czech Republic	✓	✓	✓
Bulgaria	✗	✗	✗
Austria	✓	✓	✓
BIH	✗	✗	✗
Serbia	✓	✗	✗
Moldova	✓	✓	✗
Slovakia	✓	✗	✗

Table 37 Data availability per road category: speed levels

Table 37. shows which countries have available speed level data for each road type (primary, secondary, tertiary). As can be seen, only Austria and the Czech Republic have data available for all 3 types of roads. Slovenia, Hungary and Moldova have data available for primary and secondary, but not for tertiary roads. Serbia and Slovakia have data available only for primary roads. Croatia and Bosnia and Herzegovina have no data available for any type of road.

3.3.10. Data availability: AADT

Data availability per road category: AADT			
	Primary	Secondary	Tertiary
Slovenia	✓	✓	✗
Croatia	✓	✗	✗
Hungary	✓	✓	✗
Czech Republic	✓	✓	✓
Bulgaria	✓	✓	✓
Austria	✓	✓	✓
BIH	✓	✓	✓
Serbia	✓	✗	✗
Moldova	✓	✓	✓
Slovakia	✓	✓	✓

Table 38 Data availability per road category: AADT

Table 38. shows which countries have available AADT data for each road type (primary, secondary, tertiary). As can be seen, Austria, Bosnia and Herzegovina, Slovakia, Bulgaria, Moldova and the Czech Republic have data available for each road type. Slovenia and Hungary have data available for primary and secondary, but not for tertiary roads. Croatia and Serbia have data available only for primary roads.

3.3.11. EuroRAP/iRAP Star Rating methodology

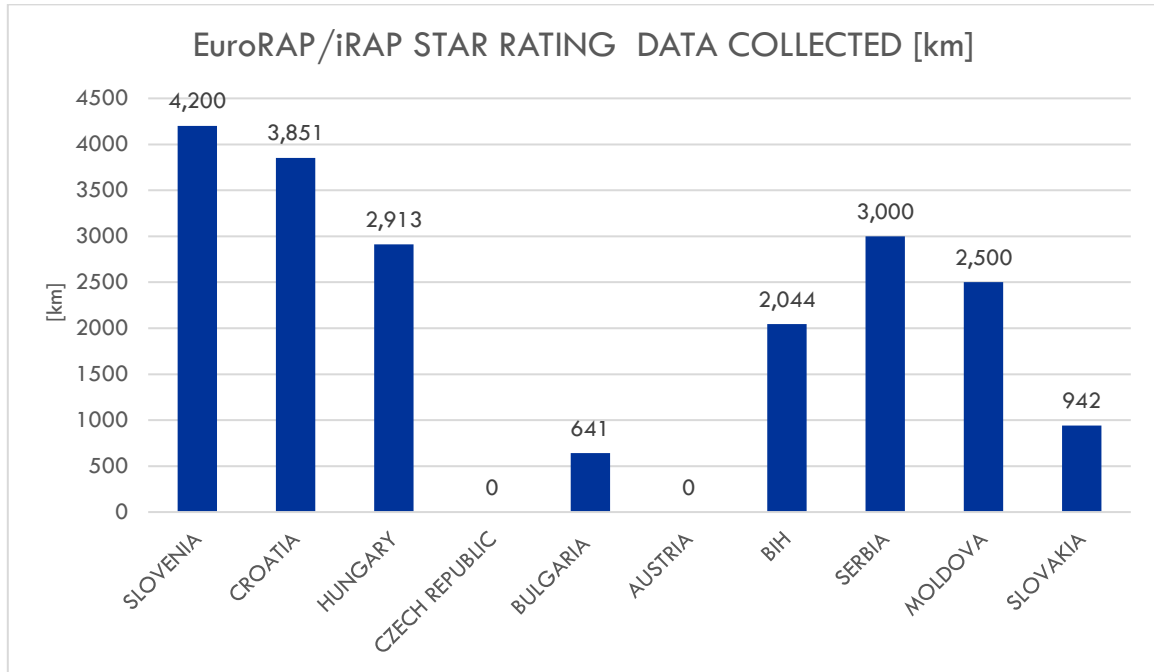


Figure 49 EuroRAP / iRAP Star Rating methodology data collected

Figure 49. shows how many kilometres of roads have already been assessed using EuroRAP methodology in the RADAR countries. The figure shows that Slovenia has collected the highest number of kilometres, and Bulgaria the least. Austria and the Czech Republic are the only countries where so far, no EuroRAP Star Rating data collection has been conducted.

3.4. Facilities for VRUs

3.4.1. Pedestrians

Presence of basic infrastructure for pedestrians			
	Primary	Secondary	Tertiary
Slovenia	✓	✓	✗
Croatia	✓	✗	✓
Hungary	✗	✓	✓
Czech Republic	✓	✓	✓
Bulgaria	✗	✗	✗
Austria	✗	✗	✓
BIH	✓	✗	✓
Serbia	✓	✓	✓
Moldova	✗	✓	✓
Slovakia	✗	✓	✓

Table 39 Presence of basic infrastructure for pedestrians by country

Table 39. shows the presence of basic infrastructure for pedestrians on the roads (primary, secondary, tertiary) in the countries concerned. As can be seen, Serbia and the Czech Republic have basic infrastructure for pedestrians present on all three types of roads. Slovenia has basic infrastructure for pedestrians present on primary and secondary roads. Hungary, Slovakia and Moldova have basic infrastructure for pedestrians present on secondary and tertiary roads. Croatia and Bosnia and Herzegovina have basic infrastructure for pedestrians present on primary and tertiary roads. Austria has basic infrastructure for pedestrians present only on tertiary roads. Bulgaria has no basic infrastructure for pedestrians present on any roads.

3.4.2. Cyclists

Presence of basic infrastructure for cyclists			
	Primary	Secondary	Tertiary
Slovenia	✓	x	✓
Croatia	x	x	x
Hungary	x	✓	✓
Czech Republic	✓	✓	✓
Bulgaria	✓	✓	✓
Austria	x	x	✓
BIH	x	x	✓
Serbia	x	✓	✓
Moldova	x	x	x
Slovakia	x	✓	✓

Table 40 Presence of basic infrastructure for cyclist by country

Table 40. shows which countries have basic infrastructure for cyclists present on their roads (primary, secondary, tertiary). As can be seen, only Bulgaria and the Czech Republic have basic infrastructure for cyclists present on all three types of roads. Hungary, Serbia and Slovakia have basic infrastructure for cyclists present on secondary and tertiary roads. Slovenia has basic infrastructure for cyclists present on primary and tertiary roads. Austria and Bosnia and Herzegovina have basic infrastructure for cyclists present only on tertiary roads. Croatia has no basic infrastructure for cyclists present on any type of road.

3.4.3. Motorcyclists

Presence of basic infrastructure for motorcyclists			
	Primary	Secondary	Tertiary
Slovenia	x	x	x
Croatia	x	x	x
Hungary	x	x	x
Czech Republic	✓	x	✓
Bulgaria	✓	✓	x
Austria	x	✓	x
BIH	x	x	x
Serbia	x	x	x
Moldova	✓	x	x
Slovakia	✓	✓	✓

Table 41 Presence of basic infrastructure for motorcyclist by country

Table 41. shows basic infrastructure for motorcyclists present on the roads (primary, secondary, tertiary) in the countries concerned. As can be seen, only Slovakia has basic infrastructure for motorcyclists present on all three types of roads. Bulgaria has basic infrastructure for motorcyclists present on primary and secondary roads. The Czech Republic has basic infrastructure for motorcyclists present on primary and tertiary roads. Moldova has basic infrastructure for motorcyclists present on primary roads. Austria has basic infrastructure for motorcyclists present on secondary roads. Slovenia, Croatia, Hungary, Bosnia and Herzegovina and Serbia have no basic infrastructure for motorcyclists present on any type of road.

4. Conclusion

This Status Report has been made primarily with the aim to collect necessary data from countries participating in the RADAR project. Data collected offer a picture of the current road safety situation in the countries concerned, for the data sets defined by this report. They will be used to support the specific outputs defined, as well as the objectives of the RADAR project itself.

There is a large amount of information indicating some basic aspects of road safety. For example, crash data collected for the countries concerned are an indicator of a measure of exposure to road risks, meaning that road users are likely to be involved in road accidents. Here we come to the issue of direct indicators, or public risk, measured as a relationship between the number of fatalities and the number of population in a country.

Thus, Figure 37 shows relative numbers of road fatalities that occurred in each country, in relation to 1,000,000 of population. It can be seen, for example, that Bulgaria is the worst performing country, with the crash rate of 96.7, while Czech Republic, Austria and Slovakia are, on the other hand, the countries with the lowest number of fatalities per 1 million population, i.e. 47.2, 46.7 and 45.9, respectively.

There are also crash rates given for VRUs in relation to the number of population. Figure 38, for example shows relative numbers of vehicle occupant fatalities reported in each country, in relation to 1,000,000 of population. Austria is the country with the smallest number of vehicle occupant fatalities (23.2). On the other hand, BIH is the country that has the largest number of vehicle occupant fatalities (51.3). As for cyclist (Figure 39), pedestrian (Figure 40) and motorcycle (Figure 41) fatalities per 1 million population, BIH (cyclists and motorcyclists) and Slovenia (pedestrians) account for the smallest numbers of fatalities. The highest crash rates are recorded in Hungary (cyclists), Moldova (pedestrians), Slovenia (motorcyclists).

Also, by analyzing the tables with data on basic infrastructure provisions for the most vulnerable road users (pedestrians, cyclists and motorcyclists), there is a question of adequate infrastructure provided for these road user groups and whether there is an infrastructure component contained in the number of road casualties. Data collected indicate that basic pedestrian infrastructure has not been provided on the roads in Bulgaria. Likewise, Croatia has no basic infrastructure provided for cyclists, on any road. Why this is the case cannot be discerned from the data offered and must be sought from other data sources. As for motorcyclists, several countries have not provided basic motorcycle infrastructure (Slovenia, Croatia, Hungary, Bosnia and Herzegovina and Serbia). The lack of basic infrastructure may be the cause of road crashes involving the road users concerned and consequences incurring thereof. To which extent this lack contributes to road crashes may be the subject of an additional study within this project, if possible.

Another direction of action may be to consider the impact of speed and speed limits on the occurrence of road crashes and their consequences. Data collected may serve as a starting point in trying to find the relationship between these indicators.

The results obtained would certainly help define cost-effective solutions to reduce the exposure of the VRUs concerned to road risks by improving the existing road infrastructure.