



Interreg



Danube Transnational Programme
RADAR

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



Road Infrastructure Safety Management Directive 2019/1396/EC (RISM) in Danube area

Thematic Area 6 Draft report

Road Infrastructure Safety Management
Directive 2019/1396/EC (RISM) in Danube
area.



RADAR – Risk Assessment on Danube Area Roads



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Internal Report Hierarchy Level			
Activity Number	6.2	Activity Title	RSEG review and assessment reports
Work Package Number	6	Work Package Title	Thematic area 6 – Road Infrastructure Safety Management Directive 2019/1936/EC (RISM) in Danube area.
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Status (F: final, D: draft, RD: revised draft):	D		
Version Number	1.1		
File Name	20210901_TA6_Report_Road Infrastructure Safety Management Directive-v1.1_FPZ		
Issue Date	01.09.2021.		
Project start date and duration	June 1, 2018 – 36 months + 6M extension in 2021		

Revision log

Version	Date	Reason	Name and Company
0.1	05.05.2021	First version	Authors/FPZ
1.0	21.05.2021.	Final draft for RSEG	Authors/FPZ, MSe/ EIRA
1.1	01.09.2021.	Amended based on RSEG feedback	Authors/FPZ, MSe/ EIRA

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1. Introduction

This Report is a second deliverable of the RADAR project extension and contributes to RADAR Strategy and Action plan WP4 (T2). The objective of this report is to complement work already done in WP4 and provide inputs to the Danube Infrastructure Road Safety Improvement Strategy (DIRSIS) and Danube Infrastructure Road Safety Improvement Action Plans (DIRSIAP) with an overview of implementation of the amended Road Infrastructure Safety Management Directive 2019/1936/EC (RISM) in Danube area.

This report also directly contributes to the new deliverable of RADAR project: the Position Paper on amended RISM directive provisions, that will demonstrate how to perform the required Network Wide Road Safety Assessments in order to identify “built-in” risk of infrastructure and undertake countermeasures with structured, comparable, and unified methodologies (TA6) in the Danube Area, as mandated by RISM directive.

2. Thematic Area 6 (TA6) topics and focus

TA 6 – Thematic Area 6 is focused on implementation of the EC Directive 2019/1936/EC Amendment in countries of the Danube Area Region. All of the Member States, with some states outside EU, successfully implemented the EC Directive 2008/96/EC and set up procedures throughout which RSIA, RSA and RSI are being performed on newly designed and existing road infrastructure. Since European Commission amended the mentioned directive, Member States need to amend respective national laws in order to include newly set requirements.

Some of the requirements set by the Directive include the extension of road safety inspections to the overall national main road network, whereas previously the safety inspections were mandated on TEN – T road network only. Member states are also obliged to define which roads represent the national main road network and need to deliver a list of roads to the Commission. Another aspect of the Directive is the increased focus on vulnerable road users (VRU's) during safety assessments. Results of the above mentioned safety inspections should also be delivered in a common format which would allow for comparison between states.

The position paper on amended RISM directive provisions will demonstrate how to perform the required Network Wide Road Safety Assessments in order to identify “built-in” risk of infrastructure and undertake countermeasures with structured, comparable, and unified methodologies (TA6) in the Danube Area as RISM directive is demanding.

3. EC Directive 2019/1936/EC (RISM)

In order to improve the road safety status in Member states of the European Union, the European parliament and the council of the European union adopted the Directive on road infrastructure safety management (RISM) on 19 November 2008. RISM directive provided a legal framework under which all member states had to put in place mechanisms which mandated the RSIA (Road Safety Impact Assessment), RSA (Road Safety Audit), RSI (Road Safety Inspection) assessments as well as NSM (Network Safety Management). After little more than a decade of the 2008/96/EC Directive successful implementation, European Commission amended the RISM directive with the 2019/1936/EC, extending the scope of safety assessments to main national roads also. Member states are obliged to implement the amendment no later than 17 December 2021 and report back to the Commission once they have successfully adopted the directive. By 31 October 2025, Member states should provide a report to the Commission on the safety classification of the entire network assessed, after which such reports should be provided every 5 years.

3.1. EC Directive 2008/96/EC

First iteration (2008/96/EC) of the RISM directive provided a legal framework under which Member States could harmonise national legislations to a common standard, and provided much needed groundwork for National regulatory bodies to establish safety related inspections, namely Road Safety Impact Assessment (RSIA) at pre-design stage, Road Safety Assessment (RSA) at design stage and Road Safety Inspection (RSI) at operation stage. The 2008/96/EC RISM directive focused mainly on roads which are part of a National TEN-T road network, but also encouraged Member States to apply its provisions to the rest of the network constructed using in whole or in part EU funding. EC Directive 2008/96/EC focused on road elements and infrastructural objects such as bridges, overpasses, junctions, intersections and other, with the exclusion of tunnels which are covered by the 2004/54/EC Directive.

3.1.1. RSA – road safety audit

RSA or “Road Safety Audit” stands for an independent, detailed, systematic and technical safety check relating to the design characteristics of a road infrastructure project, which covers all stages from planning to early infrastructure operation.

3.1.2. RSI – road safety inspection

RSI or “Road Safety Inspection” stands for an ordinary periodical verification of the infrastructure characteristics and defects that require maintenance work for reasons of safety.

3.2. EC Directive 2019/1936/EC Amendment

After approximately eleven years of the 2008/96/EC Directive successful implementation, European Commission issued the 2019/1936/EC amendment, which extended the scope of the original directive to the main national road network, while previously only TEN-T network roads were assessed. Every Member State has the freedom to define independently which roads are considered as part of the main road network and the list with the selected roads should be presented to the Commission no later than 17 December 2021.

The amendment also prescribes a targeted road safety inspection once the network wide safety assessment has been performed on the national main road network and potentially dangerous locations have been identified. Another significant amendment relates to vulnerable road users (VRU’s), with additional VRU-specific considerations being mandated by the Directive during road safety audits and inspections.

3.3. Requirements

The new directive amendment poses certain new requirements which expand or modify previously defined requirements.

Revised Directive seeks to remove disadvantages of Directive 2008/96/EZ. This goal is pursued by introducing the following main changes:

- Prescribing **transparency** and directing **further action** based on the results of road infrastructure safety management procedures.
- Incorporating a **network-wide road safety assessment**, a process of systematic and proactive risk mapping to assess the “in-built”, or inherent, road safety in the European Union.
- Extending the scope of the Directive beyond the Trans-European Transport Network (TEN-T) to **include motorways** and **primary roads** outside TEN-T network and all roads outside urban areas that are wholly or partly **built with EU funds**.
- Establishing **general requirements** regarding the characteristics of **road signs** and **traffic signs** in order to facilitate the introduction of cooperative, interconnected and automated mobility systems.
- Introducing an obligation for vulnerable road users to be systematically taken into account within all road safety management procedures.

Given that some of the EC Directive 2008/96/EC Articles were deleted, modified, replaced or supplemented by the EC Directive 2019/1936/EC, the following list contains only additional requirements set by the Directive amendment.

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Amended articles contained in the EC Directive 2019/1936/EC prescribe the following:

- Article 1:
 - 1. This Directive requires the establishment and implementation of procedures relating to road safety impact assessments, road safety audits, road safety inspections and network-wide road safety assessments by the Member States.
 - 2. This Directive shall apply to roads which are part of the trans-European road network, to motorways and to other primary roads, whether they are at the design stage, under construction or in operation.
 - 3. This Directive shall also apply to roads and to road infrastructure projects not covered by paragraph 2 which are situated outside urban areas, which do not serve properties bordering on them and which are completed using Union funding, with the exception of roads that are not open to general motor vehicle traffic, such as bicycle paths, or roads that are not designed for general traffic, such as access roads to industrial, agricultural or forestry sites.
 - 4. Member States may exempt from the scope of this Directive primary roads which have a low risk for safety, based on duly justified grounds connected to traffic volumes and accident statistics.
Member States may include in the scope of this Directive roads not referred to in paragraphs 2 and 3.

Each Member State shall notify to the Commission, by 17 December 2021, the list of motorways and primary roads on its territory and, thereafter, any subsequent changes thereto. In addition, each Member State shall notify to the

Commission the list of roads exempted in accordance with this paragraph from, or included in the scope of, this Directive, and, thereafter, any subsequent changes thereto.

The Commission shall publish the list of roads notified in accordance with this Article.

- Article 2:
 - 1. “trans-European road network” means the road networks identified in Regulation (EU) No 1315/2013 of the European Parliament and of the Council.
 - 1a. “motorway” means a road, specially designed and built for motor traffic, which does not serve properties bordering on it and which meets the following criteria:
 - (a) it is provided, except at special points or temporarily, with separate carriageways for the two directions of traffic, separated from each other either by a dividing strip not intended for traffic or, exceptionally, by other means;
 - (b) it does not cross at level with any road, railway or tramway track, bicycle path or footpath;
 - (c) it is specifically designated as a motorway.
 - 1b. “primary road” means a road outside urban areas that connects major cities or regions, or both, belonging to the highest category of road below the category “motorway” in the national road classification that is in place on 26 November 2019;
 - 6. “safety rating” means the classification of parts of the existing road network in categories according to their objectively measured in-built safety.
 - 7. “targeted road safety inspection” means a targeted investigation to identify hazardous conditions, defects and problems that increase the risk of accidents and injuries, based on a site visit of an existing road or section of road.
 - 7a. “periodic road safety inspection” means an ordinary periodical verification of the characteristics and defects that require maintenance work for reasons of safety.
 - 10. “vulnerable road user” means non-motorised road users, including, in particular, cyclists and pedestrians, as well as users of powered two-wheelers.
- Article 4:
 - 6. The Commission shall provide guidance for the design of “forgiving roadsides” and “self-explaining and self-enforcing roads” in the initial audit of the design phase, as well as guidance on quality requirements regarding vulnerable road users. Such guidance shall be developed in close cooperation with Member State experts.
- Article 5:
 - 1. Member States shall ensure that a network-wide road safety assessment is carried out on the entire road network in operation covered by this Directive.
 - 2. Network-wide road safety assessments shall evaluate accident and impact severity risk, based on:
 - (a) primarily, a visual examination, either on site or by electronic means, of the design characteristics of the road (in-built safety); and
 - (b) an analysis of sections of the road network which have been in operation for more than three years and upon which a large number of serious accidents in proportion to the traffic flow have occurred.

- 3. Member States shall ensure that the first network-wide road safety assessment is carried out by 2024 at the latest. Subsequent network-wide road safety assessments shall be sufficiently frequent in order to ensure adequate safety levels, but in any case shall be carried out at least every five years.
- 4. In carrying out the network-wide road safety assessment, Member States may take into account the indicative elements set out in Annex III.
- 5. The Commission shall provide guidance on the methodology for carrying out systematic network-wide road safety assessments and safety ratings.
- 6. On the basis of the results of the assessment referred to in paragraph 1, and for the purpose of prioritisation of needs for further action, Member States shall classify all sections of the road network in no fewer than three categories according to their level of safety.
- Article 6:
 - 1. Member States shall ensure that periodic road safety inspections are undertaken with sufficient frequency to safeguard adequate safety levels for the road infrastructure in question.
 - 3. Member States shall ensure the safety of sections of the road network adjoining road tunnels covered by Directive 2004/54/EC through joint road safety inspections involving the competent entities involved in the implementation of this Directive and Directive 2004/54/EC. The joint road safety inspections shall be sufficiently frequent to safeguard adequate safety levels, but in any case shall be carried out at least every six years.
- Article 6a:
 - 1. Member States shall ensure that the findings of network-wide road safety assessments carried out pursuant to Article 5 are followed up either by targeted road safety inspections or by direct remedial action.
 - 2. When carrying out targeted road safety inspections, Member States may take into account the indicative elements set out in Annex IIa.
 - 3. Targeted road safety inspections shall be carried out by expert teams. At least one member of the expert team shall meet the requirements set out in point (a) of Article 9(4).
 - 4. Member States shall ensure that the findings of targeted road safety inspections are followed up by reasoned decisions determining if remedial action is necessary. In particular, Member States shall identify road sections where road infrastructure safety improvements are necessary and define actions to be prioritised for improving the safety of those road sections.
 - 5. Member States shall ensure that remedial action is targeted primarily at road sections with low safety levels and which offer the opportunity for the implementation of measures with high potential for safety development and accident cost savings.
 - 6. Member States shall prepare and regularly update a risk-based prioritised action plan to track the implementation of identified remedial action.
- Article 6b
 - Member States shall ensure that the needs of vulnerable road users are taken into account in the implementation of the procedures set out in Articles 3 to 6a.
- Article 6c
 - 1. Member States shall pay specific attention, in their existing and future procedures for road markings and road signs, to readability and detectability for human drivers and automated driver assistance systems. Such procedures

shall take into account common specifications where such common specifications have been established in accordance with paragraph 3.

- 2. A group of experts established by the Commission shall, at the latest by June 2021, assess the opportunity to establish common specifications including different elements aiming at ensuring the operational use of road markings and road signs in order to foster the effective readability and detectability of road markings and road signs for human drivers and automated driver assistance systems. That group shall be formed by experts designated by the Member States. The assessment shall include a consultation of the United Nations Economic Commission for Europe.

The assessment shall take into consideration in particular the following elements:

- (a) the interaction between various driver assistance technologies and infrastructure;
 - (b) the effect of the weather and atmospheric phenomena as well as traffic on road markings and road signs present on the Union territory;
 - (c) the type and frequency of maintenance efforts necessary for various technologies, including an estimate of costs.
- 3. Taking into account the assessment referred to in paragraph 2, the Commission may adopt implementing acts to establish common specifications, relating to Member States' procedures referred to in paragraph 1 aiming at ensuring the operational use of their road markings and road signs, with regard to the effective readability and detectability of road markings and road signs for human drivers and automated driver assistance systems. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 13(2).

The implementing acts referred to in the first subparagraph shall be without prejudice to the competence of the European Committee for Standardization regarding standards for road markings and road signs.

- Article 6d
 - The Commission shall publish a European map of the road network within the scope of Directive 2019/1936/EC, accessible online, highlighting different categories as referred to in Article 5(6).
- Article 6e
 - Member States shall endeavour to establish a national system for the purpose of voluntary reporting, accessible online to all road users, to facilitate the collection of details of occurrences transmitted by road users and vehicles, and of any other safety-related information which is perceived by the reporter as an actual or potential hazard to road infrastructure safety.
- Article 7:
 - 1a. The Commission may adopt implementing acts to provide guidance according to which accident severity, including number of fatalities and injured persons, is to be reported. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 13(2).
- Article 9:
 - 1a. For road safety auditors taking their training from 17 December 2024, Member States shall ensure that the training curricula for road safety auditors includes aspects related to vulnerable road users and the infrastructure for such users.
- Article 10:

- In order to improve the safety of Union roads, the Commission shall establish a system for the exchange of information and best practices between the Member States, covering, inter alia, training curricula for road safety, existing road infrastructure safety projects and proven road safety technology.
- Article 11a:
 - 1. Member States shall provide a report to the Commission by 31 October 2025 on the safety classification of the entire network assessed in accordance with Article 5. Where possible, the report shall be based on a common methodology. If applicable, the report shall also cover the list of provisions of national updated guidelines, including in particular the improvements in terms of technological progress and of protection of vulnerable road users. From 31 October 2025, such reports shall be provided every five years.
 - 2. On the basis of an analysis of the national reports referred to in paragraph 1, in the first instance by 31 October 2027 and every five years thereafter, the Commission shall draw up and submit a report to the European Parliament and to the Council on the implementation of Directive 2019/1936/EC, in particular with regard to the elements referred to in paragraph 1, and on possible further measures, including a revision of Directive 2019/1936/EC and possible adaptations to technical progress.
- Article 12:
 - The Commission is empowered to adopt delegated acts in accordance with Article 12a amending the Annexes in order to adapt them to technical progress.
- Article 12a:
 - 1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.
 - 2. The power to adopt delegated acts referred to in Article 12 shall be conferred on the Commission for a period of five years from 16 December 2019. The Commission shall draw up a report in respect of the delegation of power not later than nine months before the end of the five-year period. The delegation of power shall be tacitly extended for periods of an identical duration, unless the European Parliament or the Council opposes such extension not later than three months before the end of each period.
 - 3. The delegation of power referred to in Article 12 may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the Official Journal of the European Union or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.
 - 4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 on Better Law-Making.
 - 5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.
 - 6. A delegated act adopted pursuant to Article 12 shall enter into force only if no objection has been expressed either by the European Parliament or by the Council within a period of two months of notification of that act to the European Parliament and to the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by two months at the initiative of the European Parliament or of the Council.

- Article 13:
 - 1. The Commission shall be assisted by a committee. That committee shall be a committee within the meaning of Regulation (EU) No 182/2011 of the European Parliament and of the Council.
 - 2. Where reference is made to this paragraph, Article 5 of Regulation (EU) No 182/2011 shall apply.
- Article 14:
 - 1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with Directive 2019/1936/EC by 17 December 2021. They shall immediately inform the Commission thereof.
When Member States adopt those measures, they shall contain a reference to Directive 2019/1936/EC or be accompanied by such a reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.
 - 2. Member States shall communicate to the Commission the text of the main measures of national law which they adopt in the field covered by Directive 2019/1936/EC.

Legend:	• Article	- Paragraph
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Note: *Only amended articles are contained above.

4. Countries in the Danube Area Region and utilised methodologies

In order to comply with the recently amended 2008/96/EC Directive, Member states, and specifically countries of the Danube Area region need to implement new procedures and adapt their national legal framework to accommodate new requirements of the 2019/1936/EC. The currently assessed countries employ several national methodologies which are used to perform in-built road safety assessment, however, at present no methodology has been report as fully compatible with the requirements posed in the 2019/1936/EC Directive.

4.1. Countries in the Danube Area Region

Project RADAR assesses the road safety situation in countries of the Danube area Region, which include, but are not limited to: Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia and Slovenia. Based on the analysis of available data on used safety assessment methods in some of the listed countries, it is evident that most of these countries primarily use RSIA, RSA and RSI methodologies for the proactive road safety assessment, with only a smaller number of countries using also iRAP/EuroRAP network wide assessments. It is also important to note that road safety audits and road safety inspections, which are most often used for road safety assessment in the observed Danube-area countries are quite costly to perform, and relatively unpractical when applied on a network-wide scale. Of the listed countries, only Austria (Austrian standard of road safety infrastructure instruments) and Czech Republic (SAMO) employ additional methodologies, which are specifically adapted for implementation within in-country local areas in order to assess the existing in-built road safety. However, those national methodologies are not yet adapted to new requirements set by the RISM Directive amendment.

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4.2. Estimated road network length on which the Directive applies

The Table 1 roughly summarizes the overall road network length which falls within the scope of the 2019/1936/EC Directive in countries of the Danube area region. The data has been obtained through a questionnaire delivered to national stakeholders and from the D1 output report of the NetSafety project. Given that some of the answers were acquired from the NetSafety project, basic assumptions and simplifications which were made to address missing data for the Netsafety project purposes were retained here as well:

- All primary roads (besides motorways) are treated as a single category.
- In cases where no response was provided for the road class (or classes) that potentially correspond to "primary roads", the respective length was assumed as 80% of the length of the road class directly below motorways.
- In case road network lengths per class were not available, these were retrieved from the European Commission's Statistical Pocketbook 2020 (EU Transport in Figures) (EC, 2020).

An approximation of the overall road network length to be assessed under the scope of the 2019/1936/EC Directive, in the Danube area region, amounts to 42948 km.

Table 1 Applicable road network length per country

Country Name	Country Code	Motorways (km)	Primary Roads (km)	Total Length (km)
Austria	AT	1749	441	2190
Bulgaria	BG	790	2900	3690
Croatia	HR	1307	7278	8585
Czechia	CZ	1210	890	2100
Hungary	HU	1233	3890	5123
Romania	RO	823	13534	14357
Slovakia	SK	496	2937	3433
Slovenia	SI	550	2920	3470
Bosnia and Herzegovina	BIH	No data (yet)	No data (yet)	No data (yet)
Serbia	SRB	No data (yet)	No data (yet)	No data (yet)
Moldova	MD	No data (yet)	No data (yet)	No data (yet)
Montenegro	MNE	No data (yet)	No data (yet)	No data (yet)
Total:		8158	34790	42948

4.3. Common methodologies used

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When evaluating safety procedures, Table 2 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 used. 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.

Table 2 Road safety assessment procedures per country

Presence of applied procedures	NWRSAs	RSIA	RSI	RSA
Slovenia	✓	✓	✓	✓
Croatia	✓	✓	✓	✓
Hungary	✓	✓	✓	✓
Czech Republic	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓
Austria	✓	✓	✓	✓

Bosnia and Herzegovina	✗	✗	✗	✗
Serbia	✗	✗	✓	✓
Moldova	✗	✗	✗	✗
Slovakia	✓	✓	✓	✓
Romania	✓	✓	✓	✓
Montenegro	✓	✓	✓	✓

Source: Analysis of available road safety data, knowledge and practices in the pp and asp countries, RADAR status report

Most common methods used for the in-built road safety assessment are RSIA, RSA and RSI, followed by iRAP/ EuroRAP protocols, with only two countries using additional national methodologies (Table 3). RSIA, RSA and RSI, as the most common proactive road safety assessment methodologies which are also the most comprehensive methodologies and can be adapted to include all of the road attributes listed in the ANNEX III of the RISM directive. However, mentioned methodologies are better suited for on-site inspections, and their cost tends to increase significantly if the methodologies are applied on a network-wide level.

Table 3 Network-wide safety assessment methodologies, used per country. Source: NetSafety project survey.

Country	Methodology		Other
	Primary	Additional	
Austria	RSA/RSI		Austrian standard of road safety infrastructure instruments
Bosnia and Herzegovina			
Bulgaria	RSA/RSI		
Croatia	RSI	iRAP/EuroRAP	
Czech Republic	RSA/RSI		SAMO / accident prediction by SFDI
Hungary	RSIA/RSA/RSI		
Moldova			
Montenegro			
Romania			
Serbia			
Slovakia	RSA/RSI	iRAP/EuroRAP	
Slovenia	RSA/RSI	iRAP/EuroRAP	

iRAP/EuroRAP methodology, which is also frequently used in the Danube area countries, already collects a substantial amount of road attributes which correspond to those mentioned in the directive (49 out of 59 road attributes) and it can easily be implemented for road safety assessment on a network-wide level. Data related to 10 remaining road attributes which are not collected for the purpose of iRAP/EuroRAP protocols, can be easily collected during the in-office road safety assessment preparation (existence of alternative routes for pedestrians and cyclists where there are no separated facilities, network operational centres and other patrolling facilities) or directly on the survey location (observed heavy vehicle volumes, presence and number of bridges, as well as relevant information concerning them, presence and number of tunnels, as well as relevant information concerning them, condition of road restraint systems, mechanisms to inform road users of driving conditions in order to prevent accidents or incidents, AID – Automatic Incident Detection systems: sensors and cameras, incident management systems, systems for communicating with emergency services). iRAP/EuroRAP Star Rating protocol is purposely designed for network-wide road safety assessment and, once the georeferenced video data of the assessed road network has been recorded, the results for the entire network (or only a specific road network sections) can be obtained based on already well-established process. RISM Directive also mentions that the results of network-wide road safety assessments should be comparable across the Union, which is an option offered by iRAP/EuroRAP protocols.

Figure 1 shows that Slovenia has assessed the highest number of kilometres using EuroRAP/iRAP, and Romania the least. Austria and the Czech Republic are the only countries where so far, no EuroRAP Star Rating data collection has been conducted.

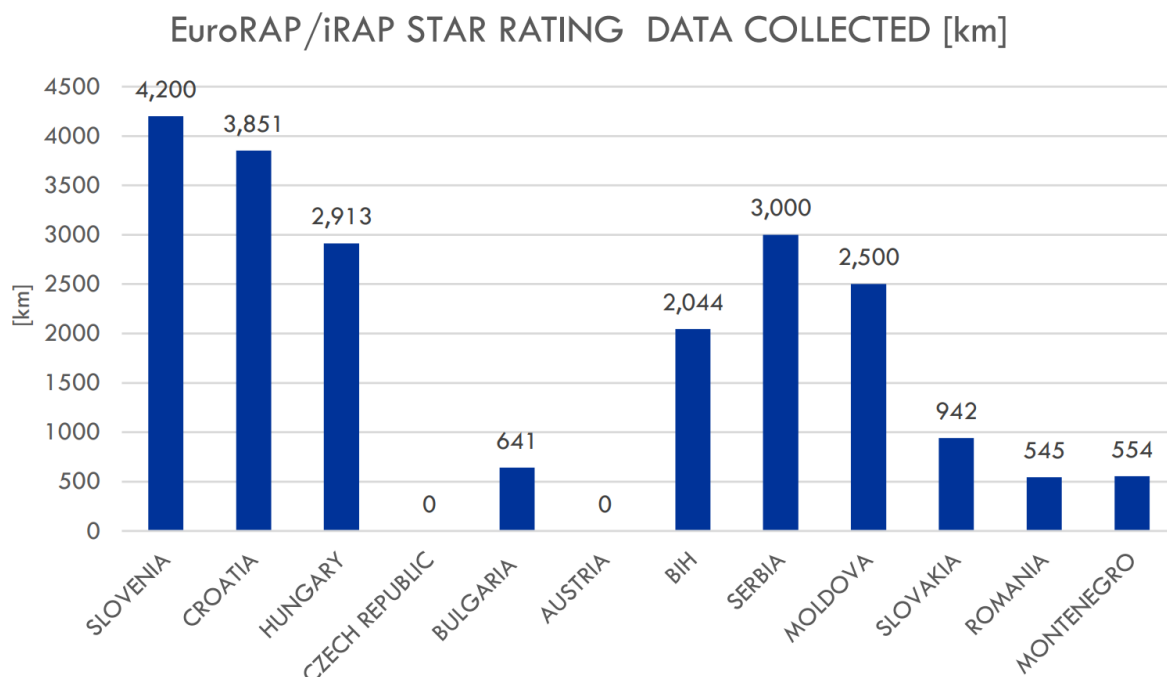


Figure 1 EuroRAP / iRAP Star Rating methodology data collected

Source: Analysis of available road safety data, knowledge and practices in the pp and asp countries, RADAR status report

The SAMO method, which is used within Czech Republic, is a proactive methodology which is focusing on horizontal curves and the speed along them to obtain safety-related results. Accident prediction models, which are also used in the Czech Republic, use few of the road characteristics





















to predict the total number of accidents per road section, such as AADT, presence of turns, horizontal curves or traffic signal.

4.4. Data availability

Annex III of the amended 2019/1936/EC directive defines indicative elements of network-wide road safety assessments, separated in 11 categories.

Data availability concerning indicative elements for (mainly) network-wide road safety assessments can be evaluated from the questionnaire survey originating from NetSafety project aimed to collect information on the road classification system across Member States, data availability related to road safety analysis, and on applied methods and practices on accident occurrence analysis and assessment of in-built safety. In Addition, data availability per country in Danube region can also be assessed from *Analysis of available road safety data, knowledge and practices in the pp and asp countries RADAR status report*. Seven countries from Danube region which have participated in NetSafety survey are Austria, Bulgaria, Croatia, Czech Republic, Hungary, Slovakia and Slovenia. The current state of data availability across the Member States is as follows: most of the Member States countries have accident data which includes data on collision type, accident severity level, and various types of additional information related to the accidents, and situation is similar in Danube region. However, regardless of the fact that different categories of collision types and complementary data types (e.g., environmental conditions) are collected in most of the countries, it was found that not that many Member States have PDO accident data and that not all of the Member States use GPS device for georeferencing road traffic accident data. Most of the countries use multiple data for linking road traffic accidents with relevant road information. GPS location is most widely used data format for this purpose (used in 77.8% Countries), followed by Road Chainage and road code that are used by 63% of Countries that have participated in the NetSafety questionnaire survey. Road Segment numbering is used in 44.4% of Countries. Data used for linking road traffic accident data with the relevant road information in each participating Danube Region country is displayed within the Table 4.

Table 4 Data used for linking road traffic accident data with the relevant road information for Danube countries

Country	Road segment numbering	Road code and chainage	GPS Location	Other
Austria				
Bosnia and Herzegovina	n/a	n/a	n/a	n/a
Bulgaria				
Croatia				
Czech Republic				
Hungary				
Moldova	n/a	n/a	n/a	n/a
Montenegro	n/a	n/a	n/a	n/a

Romania	n/a	n/a	n/a	n/a
Serbia	n/a	n/a	n/a	n/a
Slovakia	✓	✓	✓	✗
Slovenia	✗	✓	✗	✓

Source: NetSafety project survey.

Traffic flow data appears to be one of the most available data type across the Member States and in all countries it is common that AADT data is collected. Regarding Danube Area, AADT data availability per country is shown within the Table 5.

Table 5 Data availability per road category: AADT (Source: Analysis of available road safety data, knowledge and practices in the pp and asp countries, RADAR status report)

Data availability per road category: AADT	Primary	Secondary	Tertiary
Slovenia	✓	✓	✗
Croatia	✓	✗	✗
Hungary	✓	✓	✗
Czech Republic	✓	✓	✓
Bulgaria	✓	✓	✓
Austria	✓	✓	✓
Bosnia and Herzegovina	✓	✓	✓
Serbia	✓	✗	✗
Moldova	✓	✓	✓
Slovakia	✓	✓	✓
Romania	✓	✓	✓
Montenegro	✓	✓	✗

Austria, Bosnia and Herzegovina, Slovakia, Bulgaria, Moldova, Czech Republic and Romania have data available for each road type. Slovenia, Hungary and Montenegro have data available for primary and secondary, but not for tertiary roads. Croatia and Serbia have data available only for primary roads.

























The data on the percentage of heavy vehicles is usually also available. Regarding road design data, most countries have information on the number of lanes, the road width, and the presence of road safety barriers, while the other types of road design data are available in a smaller number of countries.

Operational data (posted speed limit) is available in most countries, but other three data categories including actual operating speed, junction control type, data about signalization at intersections and ramp metering are available in relatively smaller number of countries. Approximately half of the Member States perform measurements of actual operating speeds for all the observed three road types, however, few countries collect data on signalization and junction control type.

Table 6 presents amended 2019/1936/EC directive Annex III attribute availability, quality and actuality from national databases based on national answers from an undertaken NetSafety survey.

Table 6 2019/1936/EC Directive Annex III attribute availability. Source: NetSafety project

NATIONAL DATABASES			
1. General:			
Attribute	Availability	Quality	Actuality
(a) type of road in relation to the type and size of regions/cities it connects;	Medium	High	Medium
(b) length of road section;	✗	✗	✗
(c) area type (rural, urban);	✗	✗	✗
(d) land use (educational, commercial, industrial and manufacturing, residential, farming and agricultural, undeveloped areas);	✗	✗	✗
(e) property access points density;	✗	✗	✗
(f) presence of service road (e.g. for shops);	✗	✗	✗
(g) presence of road works;	✗	✗	✗
(h) presence of parking.	✗	✗	✗
2. Traffic volumes:			
Attribute	Availability	Quality	Actuality
(a) traffic volumes;	High	High	High
(b) observed motorcycle volumes;	Medium	Medium	High

(c) observed pedestrian volumes on both sides, noting 'along' or 'crossing';			
(d) observed bicycle volumes on both sides, noting 'along' or 'crossing';			
(e) observed heavy vehicle volumes;	High	Medium	High
(f) estimated pedestrian flows determined from adjacent land use attributes;			
(g) estimated bicycle flows determined from adjacent land use attributes.			
3. Accident data:			
Attribute	Availability	Quality	Actuality
(a) number, location and cause of fatalities by road user group;	High	High	High
(b) number and location of serious injuries by road user group.	High	High	High
4. Operational characteristics:			
Attribute	Availability	Quality	Actuality
(a) speed limit (general, for motorcycles; for trucks);	High	High	High
(b) operating speed (85th percentile);	Medium	Medium	High
(c) speed management and/or traffic calming;			
(d) presence of ITS devices: queue alerts, variable message signs;			
(e) school zone warning;			
(f) presence of school crossing supervisor at prescribed periods.			
5. Geometric characteristics:			
Attribute	Availability	Quality	Actuality

(a) cross section characteristics (number, type and width of lanes, central median shoulders layout and material, cycle tracks, foot paths, etc.), including their variability;	Medium	High	High
(b) horizontal curvature;	Medium	High	High
(c) grade and vertical alignment;	Medium	High	High
(d) visibility and sight distances.	✗	✗	✗
6. Objects, clear zones and road restraint systems:			
Attribute	Availability	Quality	Actuality
(a) roadside environment and clear zones;	Low	Medium	High
(b) fixed obstacles at the roadside (e.g. lighting poles, trees, etc.);	✗	✗	✗
(c) distance of obstacles from roadside;	✗	✗	✗
(d) density of obstacles;	✗	✗	✗
(e) rumble strips;	✗	✗	✗
(f) road restraint systems.	Medium	High	High
7. Bridges and tunnels:			
Data source	Availability	Quality	Actuality
(a) presence and number of bridges, as well as relevant information concerning them;	✗	✗	✗
(b) presence and number of tunnels, as well as relevant information concerning them;	✗	✗	✗
(c) visual elements representing hazards for the safety of the infrastructure.	✗	✗	✗
8. Intersections:			
Attribute	Availability	Quality	Actuality

(a) intersection type and number of arms (noting in particular the type of control and the presence of protected turns);	✗	✗	✗
(b) presence of channelisation;	✗	✗	✗
(c) intersection quality;	✗	✗	✗
(d) intersecting road volume;	✗	✗	✗
(e) presence of level crossings (noting, in particular, the type of crossing and whether they are manned, unmanned, manual or automated).	✗	✗	✗
9. Maintenance:			
Attribute	Availability	Quality	Actuality
(a) pavement defects;	Medium	High	High
(b) pavement skid resistance;	✗	✗	✗
(c) shoulder condition (including vegetation);	✗	✗	✗
(d) condition of signs, markings and delineation;	Low	High	Medium
(e) condition of road restraint systems.	Low	High	High
10. Vulnerable road users' facilities:			
Attribute	Availability	Quality	Actuality
(a) pedestrian and cycling crossings (surface crossings and grade separation);	✗	✗	✗
(b) cycling crossings (surface crossings and grade separation);	✗	✗	✗
(c) pedestrian fencing;	✗	✗	✗
(d) existence of sidewalk or separated facility;	✗	✗	✗
(e) bicycle facilities and their type (cycle paths, cycle lanes, other);	✗	✗	✗

(f) quality of pedestrian crossings with regard to the conspicuity and signposting of each facility;	✗	✗	✗
(g) pedestrian and cycling crossing facilities on entry arm of minor road joining network;	✗	✗	✗
(h) existence of alternative routes for pedestrians and cyclists where there are no separated facilities.	✗	✗	✗
11. Pre/post-crash systems for traffic injury and gravity mitigation elements:			
Attribute	Availability	Quality	Actuality
(a) network operational centres and other patrolling facilities;	✗	✗	✗
(b) mechanisms to inform road users of driving conditions in order to prevent accidents or incidents;	✗	✗	✗
(c) AID (automatic incident detection) systems: sensors and cameras;	✗	✗	✗
(d) incident management systems;	✗	✗	✗
(e) systems for communicating with emergency services.	✗	✗	✗

When observing the Table 6, it can be seen that when data is available for Annex III attributes, it is typically of high quality and actuality. Attributes concerning accidents, operational characteristics, maintenance and geometric characteristics can be found reliably within the national databases, while attributes which are related with VRU facilities, Pre/post crash systems and roadside objects are, at the moment, lacking.

4.5. Converging to a single common methodology

In order to successfully adhere to the requirements presented in the RISM directive, it is desirable that Member states of the Danube area region work together towards implementing a common methodology which will be based on all of the listed attributes provided in ANNEX III of the RISM directive, and meet all other requirements such as the comparability of the obtained results across countries in the Union. As the requirements set in the Directive are quite extensive and the foreseen implementation deadline is set to 17 December 2021, it would be counterproductive for the countries to try and develop proprietary methodologies, or adapt some of the currently used methodologies to include all of the Directive requirements. As such, Member States should consider the adaptation of some of the already available methodologies that are easy to implement for a network-wide road safety assessments, such as iRAP methodology or the final methodology proposed in the NetSafety project.

Netsafety project has the objective to assess all of the current network wide road safety assessment methodologies (proactive and reactive) in use throughout Member States and

identify the methodology which is the most appropriate to fulfil the requirements set by the Directive. If none of the currently available network-wide road safety assessment methodologies are adapted, Netsafety project will propose and set the foundation for a new network-wide road safety assessment methodology. iRAP is a well established umbrella organisation, under which various national and regional RAP's are in operation. EuroRAP operates on the territory of the European Union and connects iRAP-accredited suppliers to interested parties. iRAP protocols, primarily the Star Rating protocol, has already been implemented worldwide as well as in EU member states, with proven effectiveness. iRAP methodology not only collects 49 out of 59 road attributes prescribed in the ANNEX III of the Directive, but also allows for a cross country comparison, which has already been partially performed under the SLAIN project.

The proposed methodology should ideally aim to combine the strengths of other network-wide safety assessment methods. A well-structured and reliable method that is at the same time user-friendly should be optimal.

It is important to point out that according to the revised Directive 2019/1936/EC, common methodology should apply to motorways and primary roads.

NetSafety D.3d - *Assessment of roads on the basis of accident occurrence* report states that there is no clear correspondence between the road classes used in each Member State and the terminology of the Directive. Specifically:

- With regards to motorways, in fourteen Member States there is a specific corresponding road class. In two Member States, although there is a clear distinction of motorways from the rest of the road network, they do not constitute a separate road class in the national road classification system.
- With regards to primary roads, the lack of correspondence is much more prominent. Responses from most Member States indicated that primary roads are likely to spread across several road classes. Furthermore, the distinction between divided (dual carriageway) or undivided (single carriageway) primary roads is not always evident in the national road classification systems.
- Not all categories exist in every Member State country.

The definition and identification by each Member State of the roads falling into the categories to which the new methodology will be applied should be the key step.

Each European country has a different accident situation. However, each Member State should use similar classifications as a guide to direct investments in improving road safety. This is necessary to comply with the requirement of the revised Directive 1936/2019, art. 5: “on the basis of the results of the assessment [...], and for the purpose of prioritisation of needs for further action, Member States shall classify all sections of the road network in no fewer than three categories according to their level of safety”.

5. Performing Network Wide road safety assessment

In order to reduce the number of fatally or seriously injured in road traffic accidents and improve the overall road safety, it is necessary to implement evidence-based measures which are supported by relevant data such as road crash data and road infrastructure data.

Most severe crash hotspots have already been rectified or hotspots are no longer simple to identify as crashes become more dispersed across the road network. In order to increase the traffic safety and furtherly reduce the number of traffic crashes, it is necessary to:

- Perform thorough investigations of the relevant road traffic accident characteristics, including the circumstances, causes and mechanisms leading to crashes, affecting the severity of road crashes and involvement of road users.
- Periodically and regularly undertake proactive risk assessments of the road network in order to define priorities and select the most critical road segments on which countermeasures will be implemented.

Risk assessment methods allow for a better understanding of the consequences of road crashes and provide information on:

- How often crashes occur
- When and where they happen
- What are the typical hazards which are present on the observed road network sections
- Which vehicle, driver and infrastructure characteristics contribute to road traffic crash occurrence

The aim of a network-wide road safety assessment is to support national road safety strategies and to provide an additional layer of relevant information, combined with existing approaches. Besides settlements, network-wide road safety assessment typically covers roads outside towns and cities, where fatal and serious injuries are concentrated for vehicle occupants. Not all roads present the same risk and examining the statistics from a wide range of countries show that around 50% of total fatalities occur on as little as 10% of total roads. Network-wide road safety assessment allows for the identification of the safest as well as the least safe road sections within an observed region or country.

Network safety management is a follow-up procedure to the network wide safety assessment analysis which presents proper treatment-oriented policies to minimise risk across a road network. Network safety management utilises acknowledged safety improvement programmes alongside other approaches, such as analysis at high-risk single sites.

Table 7 gives an insight into possible data sources for RSI, RSA, iRAP and National methodologies, for the indicative network-wide road safety assessments attributes listed in the ANNEX III of the 2019/1936 EU directive.

Table 7 2019/1936EC RISM Directive attribute coverage by road safety assessment methodology

Methodologies	RSI/RSA		National methodologies	iRAP	
	Visual	In office data processing	Existing Road authority Asset management systems	AI-RAP Attributes	iRAP Attributes
Data collection			GENERAL		
(a) type of road in relation to the type and size of regions/cities it connects;	No	Yes	Yes	Yes	Yes
(b) length of road section;	Yes	Yes	Yes	Partially	Yes
(c) area type (rural, urban);	Yes	Yes	Yes	Yes	Yes
(d) land use (educational, commercial, industrial and manufacturing, residential, farming and agricultural, undeveloped areas);	Yes	Yes	Likely	Yes	Yes
(e) property access points density;	Yes	Yes	No	Yes	Yes
(f) presence of service road (e.g. for shops);	Yes	Yes	No	Yes	Yes
(g) presence of road works;	Yes	Yes	Yes	Yes	Yes
(h) presence of parking.	Yes	Yes	Likely	Yes	Yes
TRAFFIC VOLUMES					
(a) traffic volumes	No	Yes	Yes	Yes	Yes

(b) observed motorcycle volumes	Yes	Yes	Likely	Yes	Yes
(c) observed pedestrian volumes on both sides, noting "along" or "crossing"	Yes	Yes	No	Yes	Yes
(d) observed bicycle volumes on both sides, noting "along" or "crossing"	Yes	Yes	No	Yes	Yes
(e) observed heavy vehicle volumes	Yes	Yes	Yes	No	No
(f) estimated pedestrian flows determined from adjacent land use attributes	Yes	Yes	No	No	Yes
(g) estimated bicycle flows determined from adjacent land use attributes	Yes	Yes	No	No	Yes
ACCIDENT DATA					
(a) number, location and cause of fatalities by road user group	No	Yes	Yes	No	Yes
(b) number and location of serious injuries by road user group	No	Yes	Yes	No	Yes
OPERATIONAL CHARACTERISTICS					
(a) speed limit (general, for motorcycles; for trucks)	Yes	Yes	Yes	Yes	Yes
(b) operating speed (85th percentile)	Yes	Yes	Likely	Yes	Yes
(c) speed management and/or traffic calming	Yes	Yes	Yes	Yes	Yes
(d) presence of ITS devices: queue alerts, variable message signs	Yes	Yes	Yes	Partially	Partially
(e) school zone warning	Yes	Yes	Yes	Yes	Yes
(f) presence of school crossing supervisor at prescribed periods	Yes	No	Likely	No	Yes
GEOMETRIC CHARACTERISTICS					

(a) cross section characteristics (number, type and width of lanes, central median shoulders layout and material, cycle tracks, foot paths, etc.), including their variability	Yes	Yes	Yes	Yes	Yes
(b) horizontal curvature	Yes	Yes	Likely	Yes	Yes
(c) grade and vertical alignment	Yes	Yes	Likely	Yes	Yes
(d) visibility and sight distances	Yes	No	No	Yes	Yes
OBJECTS, CLEAR ZONES AND ROAD RESTRAINT SYSTEMS					
(a) roadside environment and clear zones	Yes	Yes	Unlikely	Yes	Yes
(b) fixed obstacles at the roadside (e.g. lighting poles, trees, etc.)	Yes	No	Unlikely	Yes	Yes
(c) distance of obstacles from roadside	Yes	No	Unlikely	Yes	Yes
(d) density of obstacles	Yes	No	Unlikely		Partially
(e) rumble strips	Yes	Yes	Likely	Yes	Yes
(f) road restraint systems	Yes	Yes	Likely	Yes	Yes
BRIDGES AND TUNNELS					
(a) presence and number of bridges, as well as relevant information concerning them	Yes	Yes	Yes	No	No
(b) presence and number of tunnels, as well as relevant information concerning them	Yes	Yes	Yes	No	No
(c) visual elements representing hazards for the safety of the infrastructure	Yes	Yes	No	Yes	Yes
INTERSECTIONS					
(a) intersection type and number of arms (noting in particular the type of control and the presence of protected turns)	Yes	Yes	Yes	Yes	Yes
(b) presence of channelisation	Yes	Yes	Yes	Yes	Yes

(c) intersection quality	Yes	Yes	No	Partially	Yes
(d) intersecting road volume	Yes	Yes	Likely	Partially	Yes
(e) presence of level crossings (noting, in particular, the type of crossing and whether they are manned, unmanned, manual or automated)	Yes	Yes	Yes	Yes	Yes
MAINTENANCE					
(a) pavement defects	Yes	No	Likely	Yes	Yes
(b) pavement skid resistance	Yes	No	Likely	Yes	Yes
(c) shoulder condition (including vegetation)	Yes	No	Unlikely	Yes	Yes
(d) condition of signs, markings and delineation	Yes	No	Likely	Yes	Yes
(e) condition of road restraint systems	Yes	No	Unlikely		No
VULNERABLE ROAD USERS' FACILITIES					
(a) pedestrian and cycling crossings (surface crossings and grade separation)	Yes	Yes	Yes	Yes	Yes
(b) cycling crossings (surface crossings and grade separation)	Yes	Yes	Yes	Yes	Yes
(c) pedestrian fencing	Yes	Yes	Yes	Yes	Yes
(d) existence of sidewalk or separated facility	Yes	Yes	Likely	Yes	Yes
(e) bicycle facilities and their type (cycle paths, cycle lanes, other)	Yes	Yes	Likely	Yes	Yes
(f) quality of pedestrian crossings with regard to the conspicuity and signposting of each facility	Yes	Yes	No	Partially	Yes
(g) pedestrian and cycling crossing facilities on entry arm of minor road joining network	Yes	Yes	No	Partially	Yes

(h) existence of alternative routes for pedestrians and cyclists where there are no separated facilities	Yes	Yes	No	No	No
PRE/POST-CRASH SYSTEMS FOR TRAFFIC INJURY AND GRAVITY MITIGATION ELEMENTS					
(a) network operational centres and other patrolling facilities	No	Yes	Yes	No	No
(b) mechanisms to inform road users of driving conditions in order to prevent accidents or incidents	No	Yes	Yes	No	No
(c) AID (automatic incident detection) systems: sensors and cameras	No	Yes	Yes	No	No
(d) incident management systems	No	Yes	Yes	No	No
(e) systems for communicating with emergency services	No	Yes	Yes	No	No

Figure 2 presents data collection feasibility for 2019/1936/EC directive ANNEX III attributes, per methodology.

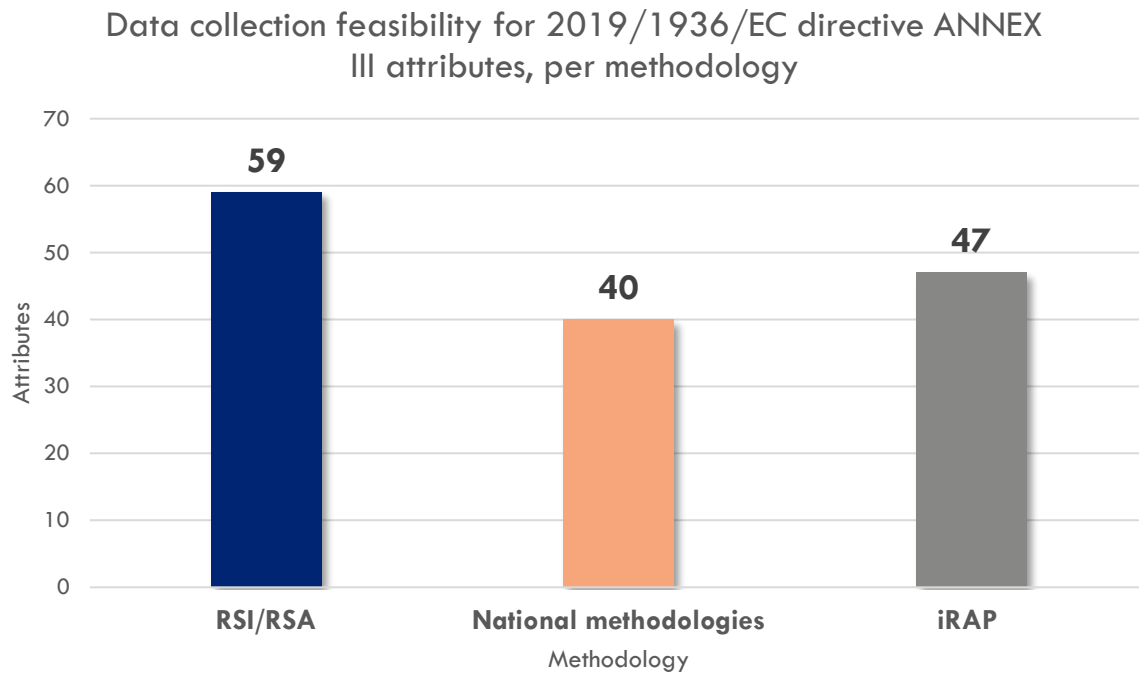


Figure 2 Data collection feasibility for 2019/1936/EC directive ANNEX III attributes, per methodology

When looking at the Figure 2, it is evident that RSI and RSA can collect all the required attributes, followed by 47 attributes (2 attributes can be partially collected for a total of 49) which can be collected by iRAP methodology. When looking at aggregated national databases, a potential for collecting around 40 attributes exists. Data collection likelihood for each of the attribute collection systems are presented within the Figure 3.

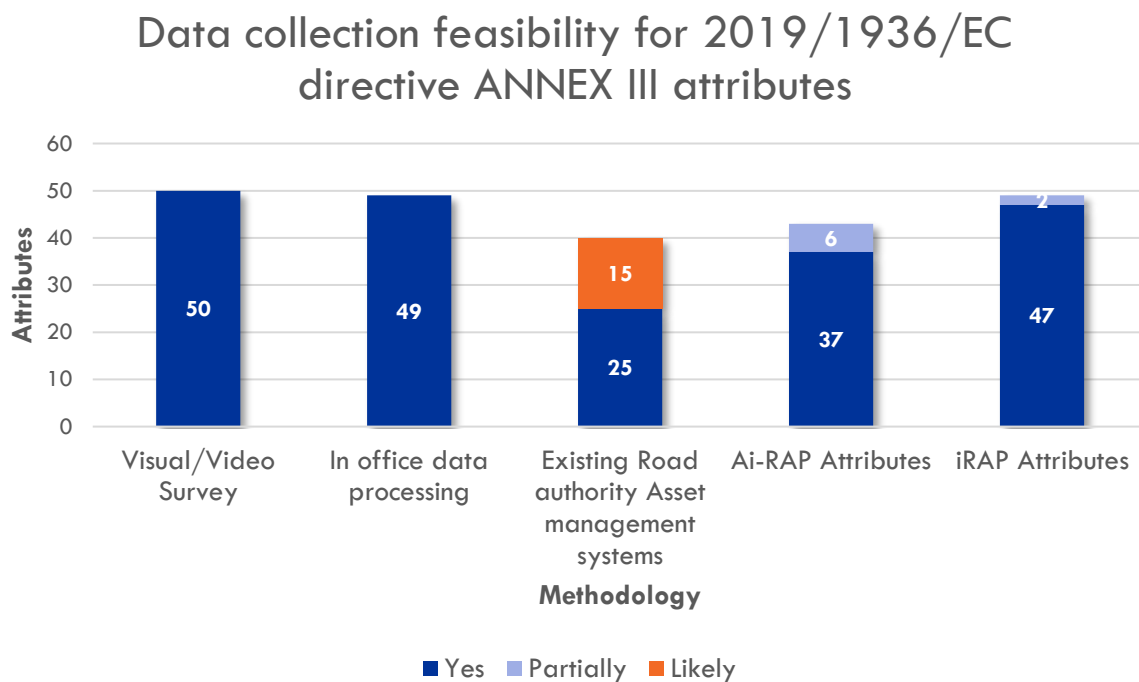


Figure 3 Data collection feasibility for 2019/1936/EC directive ANNEX III attributes



When observing the data within the Figure 3, it is clear that most attributes listed within ANNEX III can be gathered by Visual, on-site inspections as well as Video Surveys. Office data processing, has the potential to gather 49 attributes, followed by iRAP database which can be used to potentially acquire data on 47 attributes (with 2 attributes having the ability to be partially collected). Existing Road authority asset management systems (aggregated) have the potential to gather 25 attributes and 15 are likely to be found within the databases.

6. Analysis of RISM Directive implementation status and achievements in the Danube Area

To assess the current RISM Directive implementation status, a short questionnaire has been sent out to project partners and their respective national stakeholders. Questionnaire focuses on the performed implementation steps, envisioned challenges and RISM directive requirements. At the time of writing (30.08.2021) only four countries have sent back the feedback – Croatia, Bosnia and Herzegovina, Slovenia and Hungary.

RISM Directive key implementation steps (for Questionnaire considerations):

- **EU member states should adopt the RISM Directive no later than 17 December 2021.**
- **By 31 October 2025 member states should provide a report to the Commission on the safety classification of the entire network assessed, after which such reports should be provided every 5 years.**
- **Besides the TEN-T network which was already covered in 2008/96/EC, EU 2019/1936 amendment extends the obligation of safety assessment to the main road network also.**
- **Safety assessment should be performed as periodic and targeted**

6.1. RISM directive implementation process

Question 1: Which of the EU 2019/1936 RISM Directive changes are already implemented in your country? Which ones are in the implementation process? Which ones are not yet considered or are in conflict with your national legislation? Do you have additional comments to share? If possible: Can you provide evidence to support your assessment?

In Slovenia, Risk Mapping procedures are already conducted on a road network which is beyond defined TEN-T corridor. There is no conflict whatsoever with national legislation.

In Hungary, the investigations (RS audits, impact assessments) are mainly performed by the infrastructure developer (NIF), the national road operator (MK) and the county and local governments. Some international projects (e.g. SENSOR) and the network-level road safety assessment in Hungary in connection with the domestic application of 2 + 1 and 1 + 2 lane roads can be mentioned. According to the 2019/1936 Directive, the network on which the required road safety assessment will take place until 2025 has been defined as follows:

- a) Hungarian sections of the TEN-T
- b) motorways and express roads;
- d) the total length of main roads with a 2x2 lane suburban section.

The scope of the Hungarian Government Decree 176/2011 (VIII.31.) (adaptation of 2008/96/EC Directive) was extended to all motorways and expressways, all national main roads and roads exceeding the traffic volume of 10.000 pcu/day. RS Audits were required for the use of EU funds. The requirements on characteristics of the road signs and road markings are currently being amended. As the provisions of the Directive are mainly focused on motorways and main roads, the integration of aspects considering VRUs is very difficult.

Regarding Hungary, there is a noticeable resistance in this area, currently the definition of vulnerable road users is also questionable regarding its inclusion in the government decree.

Regarding Croatia, four changes are currently under the implementation process:

- Prescribing **transparency** and directing **further action** based on the results of road infrastructure safety management procedures.
- Incorporating a **network-wide road safety assessment**, a process of systematic and proactive risk mapping to assess the “in-built”, or inherent, road safety in the European Union.
- Extending the scope of the Directive beyond the Trans-European Transport Network (TEN-T) to **include motorways** and **primary roads** outside TEN-T network and all roads outside urban areas that are wholly or partly **built with EU funds**.
- Introducing an obligation for vulnerable road users to be systematically taken into account within all road safety management procedures.

6.2. RISM directive implementation status

Question 2: Please describe the current 2019/1936 RISM Directive implementation status and steps your country took to implement the mentioned Directive?

Slovenia is currently in the process of defining the primary roads.

In Hungary, preparations for the amendment of the Government Decree have been completed, the draft is at the competent ministry, further amendments are expected. The directive is expected to be adopted by December 2021.

In Croatia, there are two major legislative documents which will be adapted in accordance to RISM directive:

- Amendments to the Roads Act
 - In procedure since first quarter of 2021
- Ordinance for road safety audit and training of road safety auditors
 - Is planned to go into procedure in third quarter of 2021, after the adoption of the amended Roads Act

Bosnia and Herzegovina isn't a EU member state and there is no full obligation to implement the directive by December 2021. At the moment, implementation status in Bosnia and Herzegovina is unknown.

6.3. Stakeholders involved in the RISM directive implementation

Question 3: Who are the key actors involved in the EU 2019/1936 RISM Directive implementation?

- (i) Ministries?
- (ii) State agencies?
- (iii) Universities or higher education institutions?
- (iv) Other?

The key actor involved in the EU 2019/1936 RISM Directive for Slovenia is the Ministry of Infrastructure (consulting by University), while RSI, RSA and RSIA procedures are under responsibility of National Road Safety Agency.

At the request of the Hungarian Ministry of Innovation and Technology, a working group led by the Hungarian Public Road Non-profit Ltd. (national road operator) were involved in preparing the implementation draft. In the working group, state agencies (police, national road operator), university lecturers and experts also took part.

Regarding Croatia, key actors involved in the EU 2019/1936 RISM Directive implementation are: Ministry of the Sea, Transport and Infrastructure (Drafting changes in relevant legislation), Ministry of the Interior (through incorporating relevant features of RISM directive in National Road Safety Action Plan 2021-2030), Road authorities (through adapting internal documentation in accordance with RISM directive), Croatian Motorways Ltd. and Croatian Roads Ltd.

6.4. RISM directive implementation deadline

Question 4: What is the expected date (year) your country will fully comply to the requests proposed in the EU 2019/1936 RISM directive? Will your country manage to respect the established deadline?

Implementation deadline is expected to be met in Slovenia, except in case of exceptional delays in the coordination phase, and/or accepting of the proposal of the act in implementation of the Directive.

In Hungary, it is expected that a significant number of the requests proposed in the EU directive will be met, in respect to the deadlines.

For Croatia, the expected date is not yet clear but according to available information, the main activities will be delivered as required by the Directive.

6.5. Current challenges in the RISM directive implementation process

Question 5: What are the encountered challenges connected with the implementation of the EU 2019/1936 RISM Directive in your country?

Funding and organisation related challenges are defined as primary challenges which were encountered in Slovenia.

In Hungary, the biggest challenges emerged in 4 areas:

- Although public roads and municipal roads with a traffic volume of more than 10.000 pcu¹/day were covered by the decree in Hungary, the provisions of the decree were not really applied on these roads. In the future, part of the network of the capital city will be covered by the regulation as well, as a result of serious discussions and arguments.
- Ensuring the **independence of auditors** is problematic because the same designers and engineers are the auditors who prepare the plans as well.
- With the reference of the GDPR, **access to personal injury accident data** is becoming increasingly difficult, which hinders seriously the implementation of the government decree.
- Hungary didn't yet manage to implement the criteria to increase the safety of vulnerable road users.

Croatia has encountered challenges regarding legal framework for the RISM Directive, which is not yet fully established on a national level. Therefore, there is no proper legal base for conducting further activities.

6.6. Foreseen challenges in the RISM directive implementation process

Question 6: What are the expected challenges connected with the implementation of the EU 2019/1936 RISM Directive in your country?

Funding and organisation related challenges are defined as primary challenges which are to be expected for the future period, in Slovenia.

In Hungary, the Directive covers some radial and ring roads of Budapest (determined by Decree 432/2012 (XII.29.)) managed by the Municipality of Budapest, and main urban roads of the cities with county status. Hungary has no practice in applying the directive on these roads, and traffic data is scarce on those roads, so it is expected that the application of the directive will continue to be a challenge in the future on these roads. Furthermore, the partial lack of traffic data and the difficult access to personal injury accident data could pose a serious challenge in the future. There have been no regular traffic measurements on municipal roads since 1985. According to the plans, the manual traffic measurements on the national network won't be performed in the future, and only the automatic measurements remain.

In Croatia, challenges are expected in the following areas:

- Unclear definition of the "primary" network. There needs to be a discussion on how many road sections to include.
- Problems with distinguishing the difference between targeted and periodical road safety inspections, and how it relates to RSI, as defined in the old directive (responsibilities, financing etc...).

¹ Passenger Car Unit

6.7. Currently used safety assessment methodologies

Question 7: What are/is the network wide safety assessment methodology/ies currently in use in your country?

Following network-wide safety assessment methodologies are employed in Slovenia:

- EuroRAP Risk Mapping
- EuroRAP Star Rating
- RSI by licensed auditors
- IRI measurements – biannually
- Road deterioration measurement

Regarding Hungary, Network-wide safety assessments, so far, were not applied, and only partial, sporadic assessments were done. Network-wide analysis of the network in the future is therefore expected to yield significant results both in designing the direction of network developments and in accident prevention activities, depending of course on the availability of the basic data described in section 6 (personal injury accidents and traffic data).

EuroRAP/iRAP methodology has been occasionally used in Croatia as a network wide safety assessment methodology. Croatia utilises a country specific accident occurrence analysis which is used in order to identify hazardous locations across the road network. Methodology is not estimating the “in-built” road safety, and is reactive in it’s nature. RSA has been adopted as a standard for all new planned sections by the Croatian Motorways and other motorway operators on TEN-T network, as well as all new planned sections on state roads managed by the Croatian Roads (All of TEN-T and all major projects co-financed by the EU). RSI in Croatia is currently performed by the Sector for Road Safety and Roads Inspection of the Ministry of the Sea, Transport and Infrastructure, however, to this date a very insignificant part of the network was inspected, due to the late adoption of the 2008/96/EC Directive requirements and lack of capacity.

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6.8. Compatibility of the current methodology with RISM directive

Question 8: Are the methodologies mentioned in Question 7 fully or partially compatible with the EU 2019/1936 RISM Directive?

Network-wide safety assessment methodologies which are currently utilised in Slovenia and Hungary are partially compatible with the EU 2019/1936 RISM Directive.

Regarding Croatia, RSI and RSA are to be fully compatible with RISM Directive when Ordinance for road safety audit and training of road safety auditors gets amended, and EuroRAP/iRAP is partially compatible in it’s current state (not all Annex III attributes are collected).

6.9. Road safety procedure Ordinance

Question 9: Is there an Ordinance related to road safety procedures in your country? Are there foreseen amendments to the Ordinance on road safety audit and training of road safety auditors in relation to the amended Directive? Which institution or organization is responsible for drafting

and amending the Ordinance? What are the estimated costs related to the Ordinance drafting and amendment?

Regarding Slovenia and Hungary, an Ordinance related to road safety procedures exists.

In Slovenia, the Ordinance is in process of being updated, but there are no major amendments foreseen, mostly minor technical amendments, and update of some definitions. Responsible institution is the Ministry of Infrastructure.

In Hungary, there is a Government Decree in force since 2011. The scope of audits and the main phases of the audits on the primary roads will be amended: Previously there were 4 phases (authorization plan, construction plan, plan right before the operation, early operation), this will be reduced to 2 phases (authorization plan, plan right before the operation) regardless of the source of funds. Ministry of Innovation and Technology and Hungarian Public Road Non-profit Ltd. (national road operator) is the responsible body. Estimated costs are approximated on 2 million Forints (approx. 5500 EUR).

An ordinance for road safety audit and training of road safety auditors exists in Croatia (“Pravilnik o reviziji cestovne sigurnosti i osposobljavanju revizora cestovne sigurnosti (NN 16/16)”). There are currently three accredited training courses and up to this date, 25 road safety auditors were accredited by the National authorities. Mentioned Ordinance is foreseen to be amended in order to adapt the changes coming from the amended RISM directive, with the procedure planned for the third quarter of 2021. 5 400 € is the estimated cost for the procedure.

6.10. National main road network

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Question 10: Did you already define the roads which constitute your main road network and which will be assessed under the EU 2019/1936 RISM Directive scope? Which institution or organisation is responsible for this task? What is the set deadline? What are the estimated costs related to the main road network definition?

The process of defining the primary road network in Slovenia is in progress at the responsible institution – Ministry of Infrastructure.

In Hungary, the roads which constitute the main road network are not yet assessed. Range of roads that constitute the main road network is thus different for different safety procedures and for different pillars. The head of the elaborating working committee (Hungarian Public Road Non-profit Ltd.) and the head of the Network Development Department of the competent ministry (Ministry of Innovation and Technology) are responsible for the task. The deadline is December 2021.

Roads which define the main road network in Croatia are not defined yet. It is likely all the state roads and motorways will fall into the category of the main road network (excepting the roads with relatively small AADT and adequate safety rating). Ministry of the Sea, Transport and Infrastructure is expected to be the responsible body. Cost estimate for the procedure is approximated on 2 700 €.

6.11. Definition of the national main road network

Question 11: If the answer to Question 10 is affirmative, please describe the criteria used during the main road network definition process.

In Slovenia the criteria used during the main road network definition process is already known:

- Highways
- Expressways
- Main roads Class 1 (G-1) with AADT > 10.000
or where % of vehicles with mass > 3.500kg exceeds 12%
- Main roads that are part of TEN-T

In Hungary, in the case of the network-wide road safety assessment, the following criteria applies:

- a) Hungarian sections of the TEN-T (trans-European) road network,
- b) Motorways, expressways
- c) 2x2 lane roads, physically divided main roads outside urban areas

Croatia does not (at the moment) have the precise criteria which will be used to define main road network.

6.12. First national road safety assessment

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Question 12: When will the first network wide road safety assessment on roads defined in Question 10 be performed in your country? Is the network wide road safety assessment envisioned for every 5 years as prescribed, or will it be performed at a different frequency? (If a different frequency is foreseen, please state how frequent will it be). Which institution or organization is responsible for the network wide road safety assessment? What are the related costs?

Road assessments in line with the Directive are envisioned to be performed every 5 years in Slovenia, but in case of perceived decrease of road safety on certain sections or points there will be immediate action taken even between two assessments. Road authorities are responsible for the assessments.

The network-wide road safety assessment in Hungary is planned to take place until the end of 2024 and will be repeated every 5 years. The competent ministry (Ministry of Innovation and Technology) is responsible for the task.

First road safety assessment in accordance with RISM directive in Croatia should be carried, at the latest, by 2024. Network wide road safety assessment will afterwards be carried out (at least) every five years. Ministry of the Sea, Transport and Infrastructure is expected to be the responsible body. Cost estimate for the procedure is approximated on 27 000 €.

6.13. First national road safety assessment report

Question 13: When will the first network wide road safety assessment report be prepared in your country? Will the subsequent reports be prepared every 5 years as prescribed or will the reporting period match with your country's specific road safety assessment frequency? Which institution or organization is responsible for the report preparation? What are the related costs?

In line with the Directive, Slovenian Ministry of Infrastructure will periodically prepare reports in due time. First report will be prepared by 25.10.2025.

The network-wide road safety report in Hungary is planned to be completed until the end of 2024 and will be repeated every 5 years. The competent ministry (Ministry of Innovation and Technology) is responsible for the task.

In Croatia, first network wide road safety assessment report will be prepared until the fourth quarter of 2025. Reports will afterwards be prepared every five years. Croatian ministry of the Sea, Transport and Infrastructure is expected to be the responsible body. Cost estimate for the procedure is approximated on 5 400 €.

6.14. Road accidents summary report

Question 14: Is a preparation of reports on road accidents which occurred on the roads within the network covered by the application of the Directive foreseen in your country? Which institution or organization is responsible for the report preparation? What are the related costs?

A preparation of reports on road accidents which occurred on the roads within the network is already being done by Slovenian Police and National Road Safety Agency on an annual basis. The costs are not known, since this is done as part of their core activity.

A preparation of reports on road accidents which occurred on the roads within the network covered by the application of the Directive is foreseen in Hungary. The road operator is obliged to carry out a regular road safety inspection at least every 5 years in order to determine the safety features of the road and to prevent accidents. Responsible body in the case of national roads is the Hungarian Public Road Non-profit Ltd.; and in the case of local public roads the respective local road operator.

In Croatia, delivery of the reports on road accidents which occurred on the roads within the network covered by the application of the Directive is not yet implemented, but it is foreseen. Road Authorities are expected to be responsible for drafting the reports. Estimated cost is 1 100 € per report.

6.15. Traffic accident average social cost

Question 15: Will your country perform analysis of the traffic accident average social cost? Will your country perform analysis of the severe traffic accident average social cost? Which institution or organization will be responsible to perform such analysis? What are the estimated costs related to the analysis?

Analysis of the traffic accident average social cost is already being performed in Slovenia and Hungary, by Ministry of Infrastructure and National Road Safety Agency with support of consulting company in Slovenia, and by KTI (Institute for Transport Sciences Nonprofit Ltd.), the background institution of Ministry of Innovation and Technology in Hungary.

Regarding Croatia, analysis of the traffic accident average social cost is not yet drafted, and needs to be done as soon as possible. Ministry of the Sea, Transport and Infrastructure is expected to be the responsible body. Analysis should be updated every five years.

6.16. Collected road attributes of the RISM directive

Question 16: Please, list all of the attributes mentioned in the ANNEX III of the EU 2019/1936 RISM Directive that you plan to collect, in order to comply with the Directive: Note: if most attributes will be collected, indicate only those attributes which will be left out (state clearly that those attributes are not collected).

All of the attributes from ANNEX III are planned to be collected in Slovenia. The data is going to be combined from different sources/institutions that already collect such information.

Regarding Hungary and Croatia, it is not yet clear which ANNEX III attributes will be collected.

6.17. Learnings from the questionnaire survey

Regarding RISM implementation in Danube Area, most of the respondent countries, which are Slovenia, Bosnia and Herzegovina, Hungary and Croatia are well underway with implementing the EU 2019/1936 RISM Directive changes (with the exception of Bosnia and Herzegovina, since the country isn't an EU member state). While challenges are to be expected in various country-specific areas, implementation deadlines for all main activities are expected to be met in all countries, exempting Bosnia and Herzegovina for aforementioned reasons.

7. Conclusions

Analysis, recommendations and action plans related to the guidelines on the implementation of the amended Road Infrastructure Safety Management Directive has been conducted within this *Thematic Area 6: Road Infrastructure Safety Management Directive 2019/1396/EC (RISM) in Danube area* document. 2019/1396/EC (RISM) in Danube area is of paramount importance for the future of Road Infrastructure safety in Danube area but also in Europe.

This document serves as a support towards ASPs stakeholders and countries participating within RADAR project in their attempt to transpose and implement amended RISM Directive, as it holds relevant information regarding RISM directive and its requirements, analysis of RISM Directive implementation status and achievements in the Danube Area, compatible network wide safety assessment analysis, common methodologies which are used, as well as data availability analysis.

The assessment of requirements related to the implementation of the amended RISM directive is presented, and the document can be utilised as a pathfinder manual with recommendations which can be used by national, regional and local stakeholders in their processes to establish systems, mechanisms and methodologies to implement RISM directive during 2021 and 2022.

**RADAR project Thematic Area 6 (TA6): Road Infrastructure Safety Management
Directive 2019/1936/EC (RISM) in Danube area**

RECOMMENDATIONS SHEET (DRAFT)

Recommendations for state governments/ministries/agencies:

- *In the process of definition of Primary road network, national authorities should encourage including roads where at least 50% of fatal and serious accidents occur.*
- *Country specific national classification criteria should be encouraged in order to enable proper classification of high, medium and low risk roads, based on accident reduction potential as a direct consequence of road infrastructure improvements.*
- *Safe System concept should be built in in all road infrastructure related legal acts*
- *Special attention needs to be given to protecting the Vulnerable Road Users and promoting Active modes of Transport by developing dedicated road infrastructure.*
- *All investment plans in road infrastructure safety improvements should be made based on cost/benefit analysis with modelling of savings in terms of fatal and serious injuries prevented.*
- *Raise the minimal road safety design standards for new and existing road infrastructure.*

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Recommendations for local governments:

- *Road safety audit and inspection procedures should be performed on regional road network based on crash occurrence analysis.*
- *Special attention needs to be given to protecting the Vulnerable Road Users and promoting Active modes of Transport by developing dedicated road infrastructure in urban and suburban areas.*
- *Promote and expand 30 km/h speed limit zones in residential areas.*

Recommendations for road authorities:

- *Significantly increase weight of road safety priorities in investment and maintenance plans development*
- *Define clear strategy and action plan to reduce 50% of fatal and serious accidents on managed road network by 2030.*
- *Set internal guidelines above the minimal road safety standards*

8. References

1. Directive 2008/96/EC of the European Parliament and of the Council of 19 November 2008 on road infrastructure safety management

Available at:

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0096>

2. Directive (EU) 2019/1936 of the European Parliament and of the Council of 23 October 2019 amending Directive 2008/96/EC on road infrastructure safety management

Available at:

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L1936&from=EN>

3. Project SLAIN, “How-to” guide for network wide road assessment,

Available at:

https://eurorap.org/wp-content/uploads/2021/03/SLAIN_D4.1_How-to-guide_V1_FPZ.pdf

4. Project NetSafety deliverable reports (not yet publicly available)