

# Road Infrastructure Safety in regional projects – safety for all users

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[www.interreg-](http://www.interreg-)

[danube.eu/RADAR](http://danube.eu/RADAR)



# Project Identity



2nd Call DTP  
**Better connected and  
energy responsible  
Danube region**



June 2018  
May 2021



1.523.064  
ERDF



210.307  
IPA



96.262,5  
ENI

[www.interreg-danube.eu/RADAR](http://www.interreg-danube.eu/RADAR)

*Your Road Safety is on our RADAR.*

**RADAR - Risk Assessment on  
Danube Area Roads**



# Who we are

## Project Partners

European Institute for Road Assessment  
- EuroRAP, Ljubljana, Slovenia

Automobile and Motorcycle Association  
of Slovenia, Ljubljana, Slovenia

Road Safety Board, Vienna, Austria

Faculty of Traffic Science, Zagreb,  
Croatia

General Automotoclub of the Czech  
Republic, Prague, Czech Republic

KTI Institute for Transport Sciences  
Nonprofit Ltd, Budapest, Hungary

Bulgarian Association for Road Safety,  
Plovdiv, Bulgaria

Bosnia and Herzegovina Automobile  
Club, Sarajevo, BiH

Automobile Club of Moldova, Chisinau,  
Moldova



## Associated Partners

Ministry of Infrastructure, Slovenian  
Infrastructure Agency, Slovenia

National Motorway Company, Ltd, Slovakia

Croatian Roads Ltd, Zagreb, Croatia

The Road and Motorway Directorate of the  
Czech Republic

Public Company Roads of Federation of  
Bosnia and Herzegovina

European Union Strategy for Danube Region  
Priority Area 1b - Road, Rail and Air links

Ministry of Transport and Maritime Affairs,  
Montenegro

Road Infrastructure Agency, Bulgaria

National Company For Roads Infrastructure  
Administration, Romania

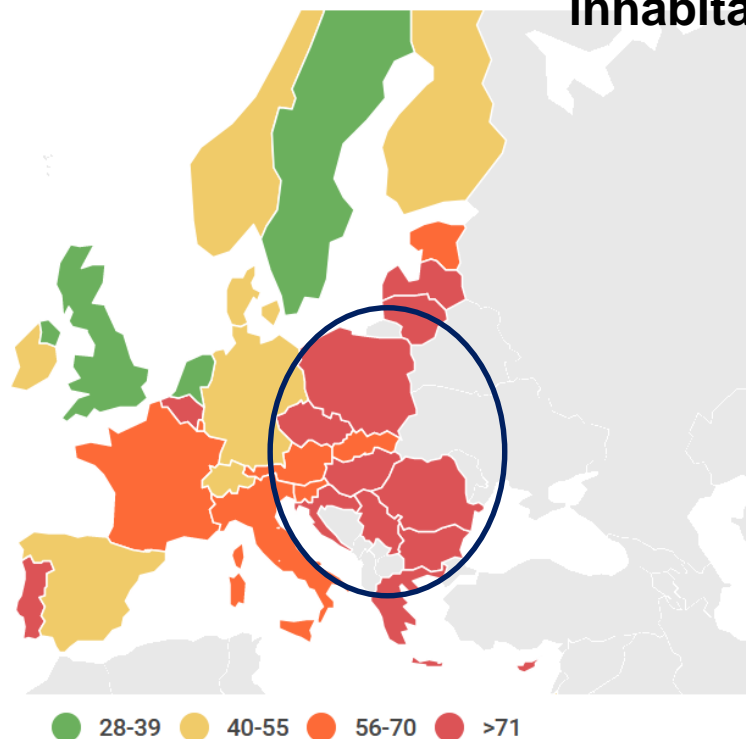
Ministry of Economy and Infrastructure,  
Moldova

iRAP, United Kingdom

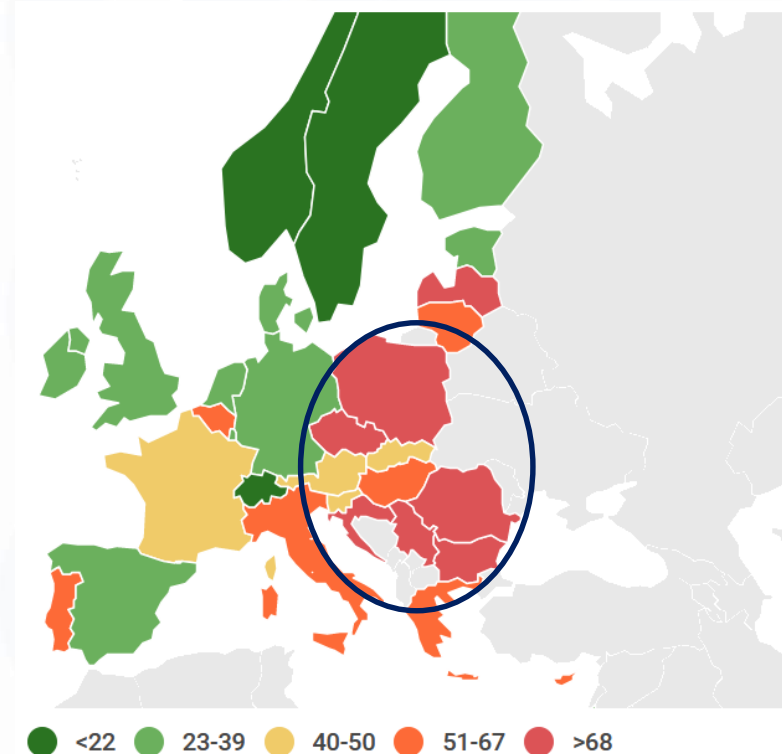


# Why RADAR with one look

Road deaths per million  
inhabitants



2010



2019

Source: European Transport Safety Council, [www.etsc.eu](http://www.etsc.eu)

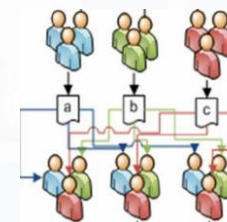
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**Danube Infrastructure Road Safety  
Improvement Strategy and Action Plan**

# RADAR first 2 years in brief



## Road Safety procedures Training Concept

- Survey on needs
- Status Report
- Training Syllabus
- All training materials and software translated to 7 principal languages of the partner countries

## Training Courses

- 8 countries: 3-day live training sessions
- 4 webinars

## Exchange of good practices

- 4 thematic Study Visits
  - Slovenia/Croatia – VRU
  - UK – Safer Roads Investments Plans
  - HU – Speed Management
  - AT – Safety near Schools

## Road Safety Expert Group

- SAFER ROADS INVESTMENTS PLANS
- VULNERABLE ROAD USERS
- ITS AND SPEED MANAGEMENT
- ROAD SAFETY NEAR SCHOOLS

## Danube Infrastructure Road Safety Improvement Strategy and Action Plans

Methodology used: EuroRAP and ViDA software

**COMING SOON!**

[www.interreg-](http://www.interreg-danube.eu/RADAR)



## Road Safety Procedures Training Concept



- [www.interreg-danube.eu/approved-projects/radar/outputs](http://www.interreg-danube.eu/approved-projects/radar/outputs)

## Training Courses



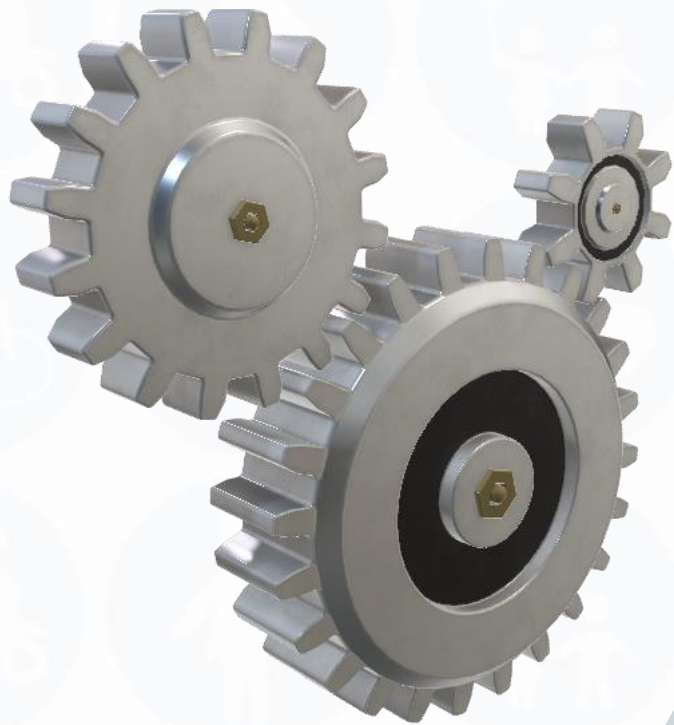
- [www.interreg-danube.eu/approved-projects/radar/section/road-infrastructure-safety-training-courses](http://www.interreg-danube.eu/approved-projects/radar/section/road-infrastructure-safety-training-courses)

## Exchange of Good Practices



- [www.interreg-danube.eu/approved-projects/radar/outputs](http://www.interreg-danube.eu/approved-projects/radar/outputs)

# Next steps



4 Pilot Actions in  
7 countries:  
**Implementation  
ready concept  
plans**

**COMING  
SOON!**

4 thematic areas  
reports and  
**recommendatio  
ns:**

- Safer Roads Investments Plans
- Vulnerable Road Users
- ITS provisions for Speed Management
- Road Safety Near Schools

**Road  
Infrastructure  
Improvement  
Strategy  
and Action  
Plans**

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# RADAR Thematic Areas

 Safer Roads Investments  
Plans

 Vulnerable Road Users

 Speed Management

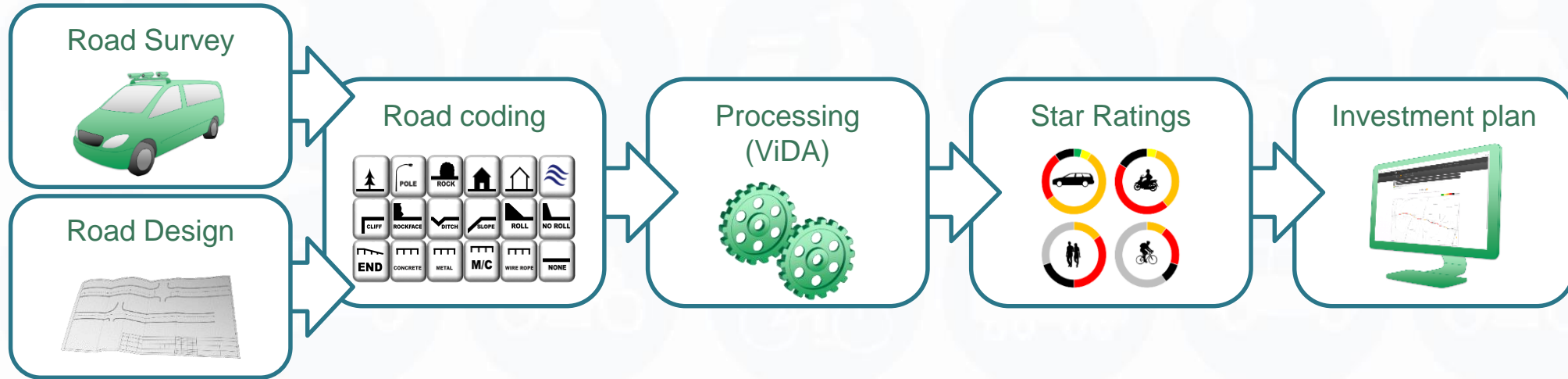
 Road Safety Near Schools

# TA1: How to target infrastructure spending with Safer Roads Investment Plans?

State of the art in Danube region Countries:

- No dedicated road safety fund or budget in the majority of participating countries
- Where present, there is no specific report of implementation
- About half of participating countries do use EU funding for road infrastructure safety upgrades at the moment.
- Funds often distributed ad-hoc, no systematic approach, no prioritization

# Safer Roads Investment plan



- SRIP - the final output of the iRAP road assessment procedures
- Benefit to cost ratio (BCR) is calculated for each countermeasure proposed
- Analysis of costs and benefits is country-specific, based on country's statistical value of life and the countermeasure costs



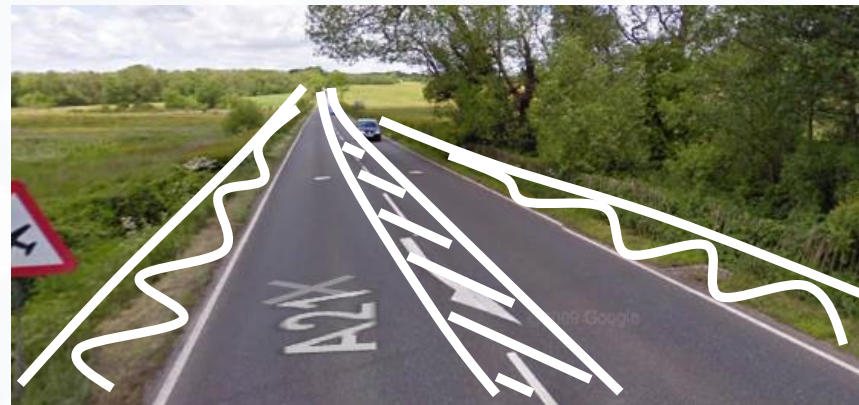
# Safer Roads Investment plan

90 proven countermeasures

300+ engineering trigger sets

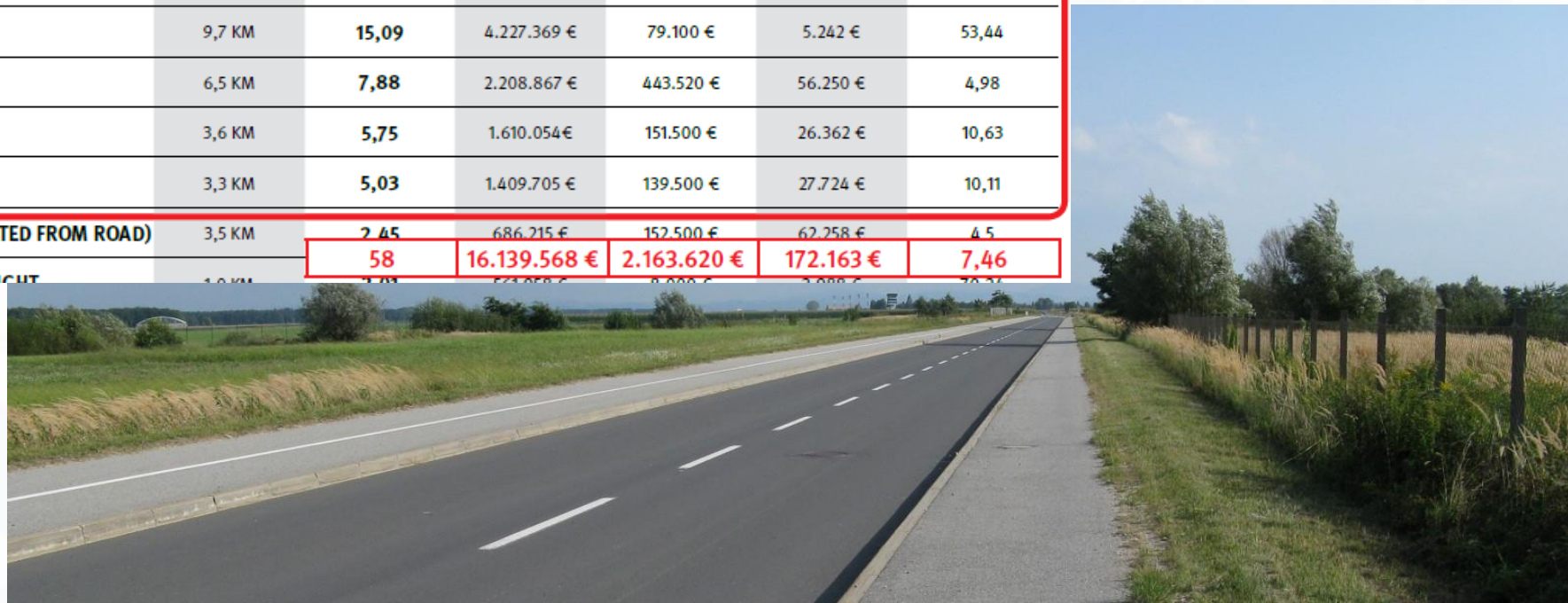
Calculate potential lives saved

Minimum BCR criteria set



# Example of Safer Roads Investment Plan

COUNTERMEASURE TYPE	LENGTH	FSI'S SAVED (20 YEARS)	PV OF SAFETY BENEFIT (20 YEARS)	ESTIMATED COST (20 YEARS)	COST PER FSI SAVED	PROGRAM BCR
ROUNDBABOUT	9	23,86	6.683.573 €	1.350.000 €	56.585 €	4,95
SHOULDER SEALING (>1 M)	9,7 KM	15,09	4.227.369 €	79.100 €	5.242 €	53,44
LANE WIDENING (UP TO 0,5 M)	6,5 KM	7,88	2.208.867 €	443.520 €	56.250 €	4,98
ROADSIDE BARRIERS – RIGHT	3,6 KM	5,75	1.610.054€	151.500 €	26.362 €	10,63
ROADSIDE BARRIERS – LEFT	3,3 KM	5,03	1.409.705 €	139.500 €	27.724 €	10,11
FOOTPATH PROVISION (SEPARATED FROM ROAD)	3,5 KM	2,45	686.215 €	152.500 €	62.258 €	4,5
SIDE SLOPE IMPROVEMENT – RIGHT	1,0 KM	58	16.139.568 €	2.163.620 €	172.163 €	7,46



# Safer Roads Investment Plan enables information on:

- where the most affordable and cost-effective road improvements can be made on the network
- the number of deaths and serious injuries that would be avoided if the plans were to be implemented
- the economic benefit of the plan, in terms of the benefit-cost ratio showing returns on investment
- the cost of the plan, incorporating capital and maintenance costs
- the estimated cost per death and serious injury avoided
- the results of the plan can be displayed as the entire road network or filtered for individual road sections

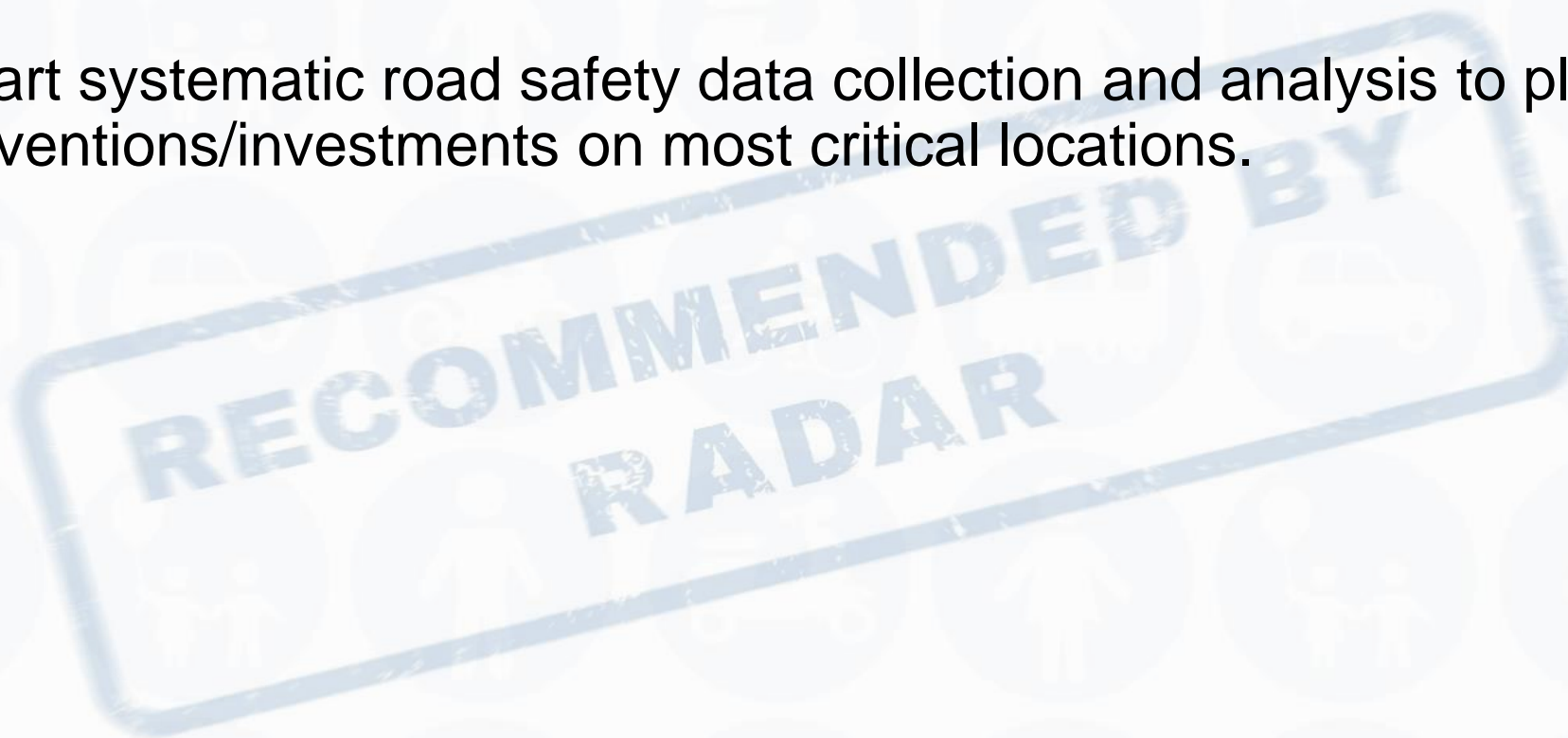


# Recommendations for states (governments/ministries/agencies)

- to ensure a portion of road infrastructure investments is allocated to road safety intervention
- to ensure embedding of the Safe system approach into the mainstream of road design/investment and maintenance legislation and practice
- to ensure trainings of road safety auditors
- to transfer Safe system approach to local governments and local road authorities
- to take into serious consideration also 2nd level roads, like regional roads
- make knowledge transfer with demonstrations of good practices and approaches for road authorities and to regional/local governments

# Recommendation for local governments

- to start systematic road safety data collection and analysis to plan interventions/investments on most critical locations.

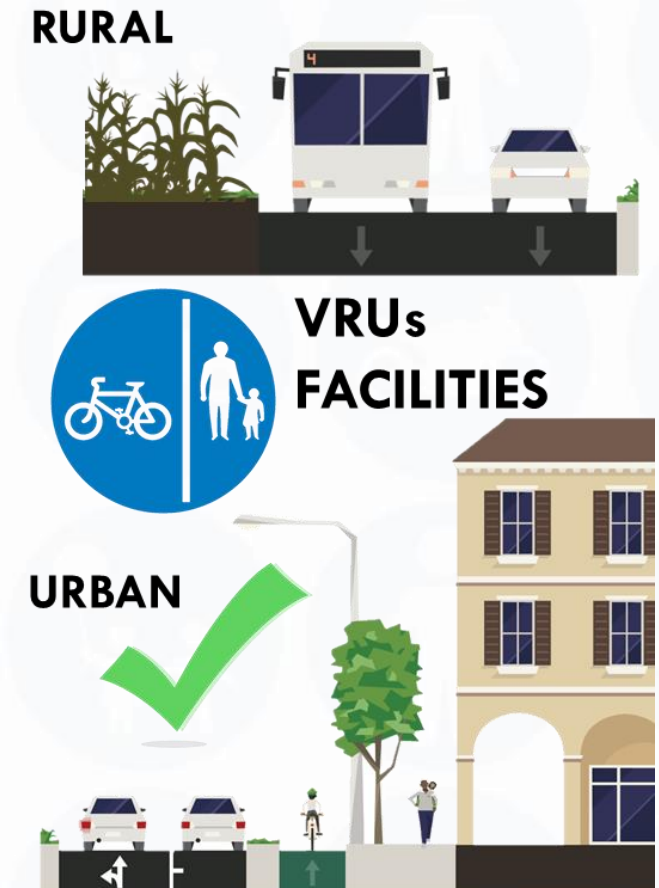
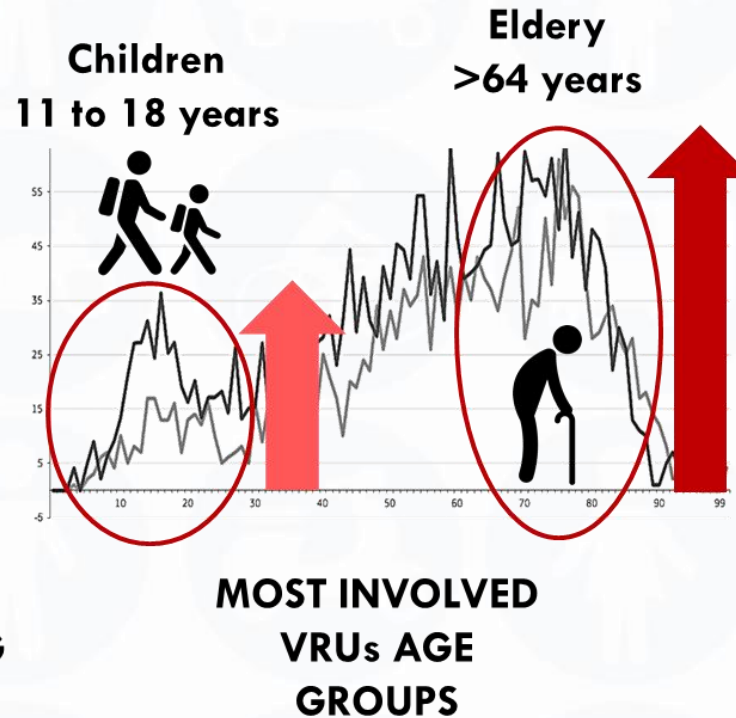
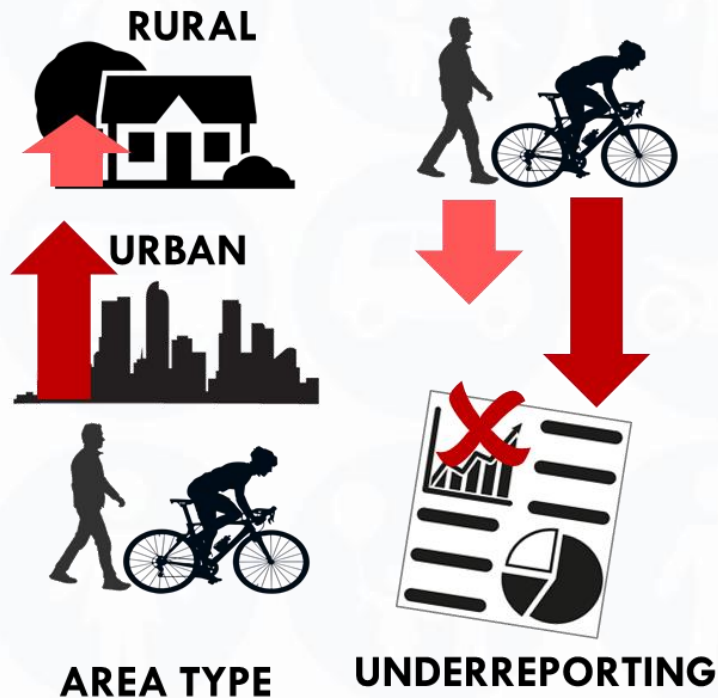


# Recommendations for road authorities

- to form own special road safety funds within regular or investment funds dedicated for direct investments in road safety upgrades in terms of road safety equipment and measures at locations with most effectiveness
- to follow the road safety trends and good practices to plan maintenance and upgrades of existing road network in operation,
- to use the methodologies for selecting most critical locations with highest potential savings



# TA 2: What can we do for Vulnerable Road Users infrastructure safety?





Safe system concepts  
(multilateral approach)

Relevant legislation

planning,  
design,  
construction and  
maintenance

Road safety  
audits,  
assessments  
and projects

VRUs  
countermeasures  
selection  
criteria



Harmonise  
and align  
legislation

Remove legal  
barriers

National laws

In-country  
regulations

Sub-normative  
acts and  
ordinances



Unified  
protocol for  
VRUs risk  
assessment

Official,  
standardised  
methodology

Objective  
road safety  
indicators

Defined  
minimal  
threshold  
values for road  
safety  
indicators

Comparable  
results



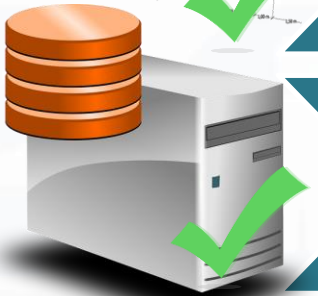
Standardised  
countermeasures  
implementation  
process

Objective  
criteria

Considers  
AADT, peak-  
hour VRUs  
flows and  $V_o$

Defined  
threshold  
values of  $V_o$   
and AADT for  
segregation

CBA, tactical  
urbanism, space-  
wise planning  
and stakeholder  
inputs



Develop or  
restructure  
and link  
relevant  
databases

Periodically  
collect  
supporting  
data

Link police  
database with  
hospital data

Develop new  
analytical  
software

Provide free  
and easy  
access to all  
stakeholders



Improve traffic  
culture and  
public  
awareness

Trainings for  
children in  
kindergartens  
and schools

National  
campaigns  
and  
conferences  
for VRUs

Disseminating  
information to  
the public by  
various media  
sources

# TA3 Smart Speed Management Infrastructure

## Speeding and speed limits

- Absolute speeding
- Relative speeding
- Speed has a direct influence on crash occurrence

	Built-up areas	Rural roads	Motor roads	Motorways
Austria	50	100	100	130
Montenegro	50	80	100	130
Greece	50	90	110	130
Romania	50	90	100	130
Slovenia	50	90	110	130
Bosnia and Herzegovina	50	80	100	130
Bulgaria	50	90	120	140
Croatia	50	90	110	130
Hungary	50	90	110	130



## Recommendations for state governments/ministries/agencies

- To define – at least on long run - a national minimal standard for the safety of existing and new roads based on one of the internationally recognized methodologies. To elaborate guidelines for Intelligent Transportation System, speed management and traffic calming approaches;
- To ensure certain portion of road infrastructure investments is allocated to road safety intervention;
- To ensure embedding of the Safe System approach into the mainstream of road design/investment and maintenance legislation and practice;
- To ensure trainings of road safety auditors;
- To transfer Safe system approach to local governments and local road authorities;
- To take into serious consideration also 2<sup>nd</sup> level roads, like regional roads;
- Make knowledge transfer with demonstrations of good practices and approaches for road authorities and to regional/local governments.

## Recommendations for local governments

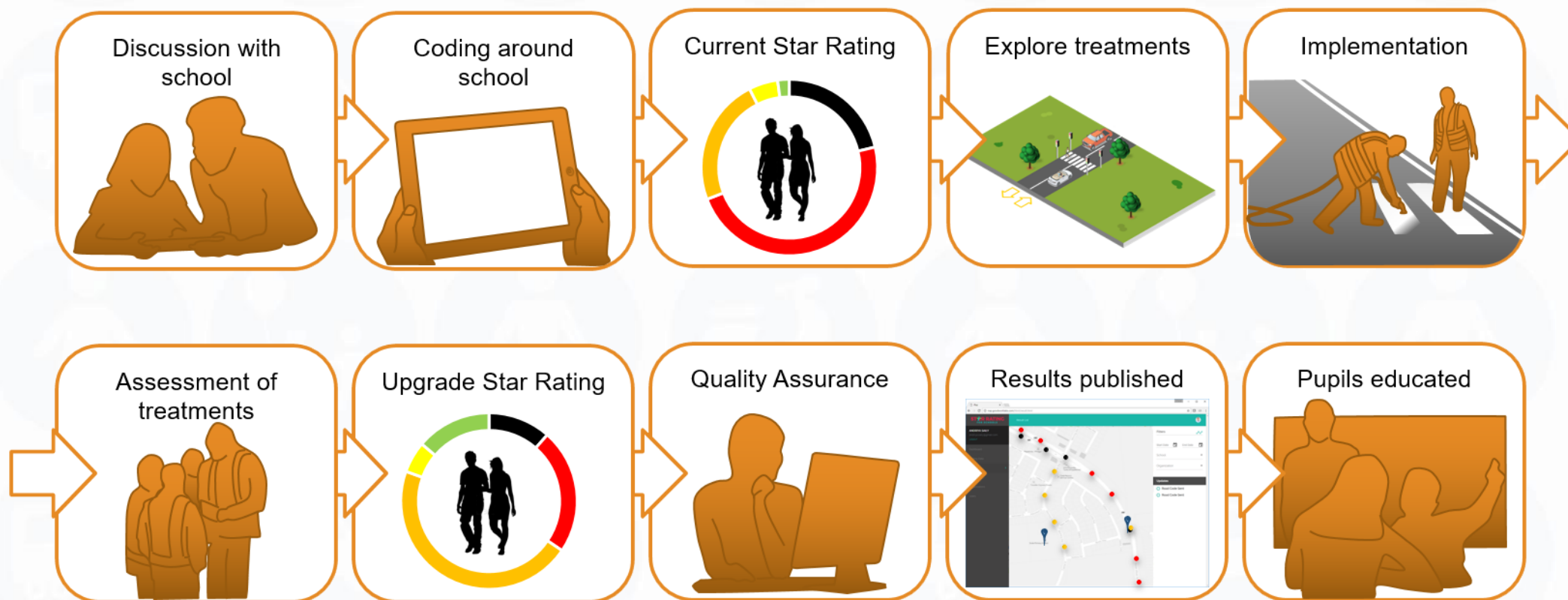
- To start systematic road safety data collection and analysis to plan interventions/investments on most critical locations.
- New ideas and recommendations:
  - Speed-activated warning signs (e.g. “Slow down” in the approach of bends and other dangerous locations);
  - Variable speed limit signs on high-level roads (traffic and/or weather-dependent);
  - Time-dependent speed limits, e.g. in the vicinity of schools during opening hours;
  - Transversal rumble strips in the approach of junctions or sharp bends;
  - Efficiency of administration of fines from automatic speed enforcement;
  - Lack of resources among authorities tasked with the issuing of fines;
  - Different degrees of automation (centralized & nearly full automation in France. Inefficient manual processing in other countries).

## Recommendations for road authorities

- Speed limits setting: elaboration and continuous revision of guidelines & systematic implementation;
- Speed limits consistency: differentiated speed limits depending on the function, alignment, volume and structure of traffic must be defined, in accordance with the reasonable local speed limits;
- Speed enforcement: implementation of section control, minimization of the obstacles in violation, processing procedures;
- Speed data collection and analysis: systematic collection of speed data development of anonymized speed database. Further development of the methodology of analysis (for example speed development by road types, etc. )

# Road Infrastructure Safety near Schools in Danube region

- A free to use tool for treatment support and infrastructure assessment [www.starratingforschools.org](http://www.starratingforschools.org)





# Recommendations for state authorities

- Develop and support specific design guidelines for road sections in the vicinity of schools,
- Define in the Road Traffic Code special speed limits to be applied on road sections in the vicinity of schools,
- Ensure adequate funding for road safety interventions in primary roads in the vicinity of schools,
- Ensure embedding of the Safe System approach into the mainstream of road design/investment and maintenance legislation and practice,
- Start systematic collection of data on road crashes near schools and related casualties,
- Systematically estimate and publish key performance indicators on the road network around schools,
- Transfer Safe system approach to local governments and local road authorities,
- Support knowledge transfer with demonstrations of good practices and approaches towards road authorities and regional/ local governments.

# Recommendations for local governments

- Ensure adequate funding for road safety interventions in local roads in the vicinity of schools,
- Start systematic collection of data on road crashes near schools and related casualties,
- Organize educational campaigns to promote safer transport to/from schools.

# Recommendations for road authorities

- Form own special road safety funds within regular or investment funds dedicated for direct investments in road safety, to implement upgrades in the vicinity of schools
- Follow the road safety trends and good practices to plan maintenance and upgrade of existing road network in the vicinity of schools,
- Use appropriate methodologies to identify hazardous locations near schools and the causes of road safety problems, identify intervention priorities and implement countermeasures,
- Conduct “before and after” studies to evaluate the road safety effect of implemented interventions.

# SABRINA: Safer Bicycle Routes in Danube Area



## Project duration:

1 July 2020–31 December 2022

## Project budget:

Overall: 2,086,019.00 €

ERDF Contribution: 1,701,992.40 €

ENI Contribution: 71,123.75 €



## Priority:

Better connected and energy responsible Danube region.

## Specific objective:

Support environmentally friendly and safe transport systems and balanced accessibility of urban and rural areas.



Source: [www.slovenia.info](http://www.slovenia.info), Photo: Tomo Jeseničnik

[www.interreg-danube.eu/SABRINA](http://www.interreg-danube.eu/SABRINA)



# SABRINA in a nutshell

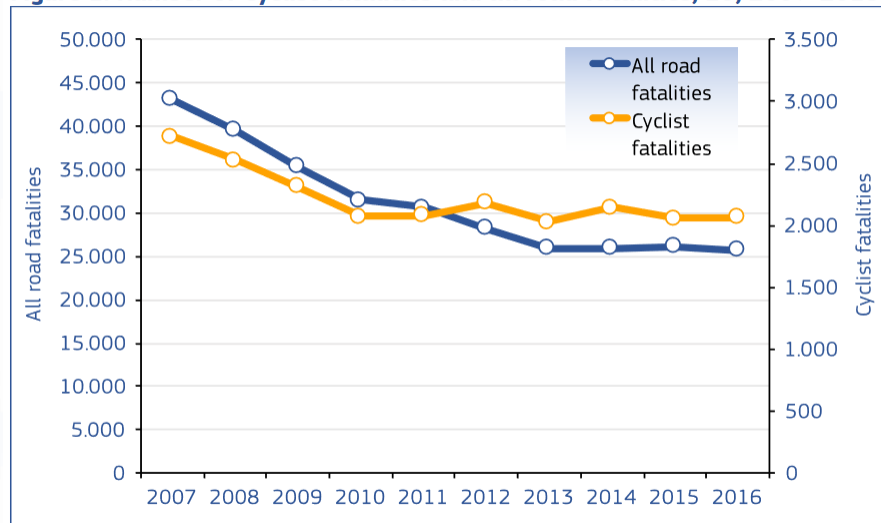
Maps infrastructure risks on existing Danube region EuroVelo routes and provides a strategic decision-making toolkit that will:

- increase stakeholders' capacity in all stages of decision making,
- build up knowledge and cooperation at different levels,
- prevent the development of killer cycling infrastructure in early stages of development.



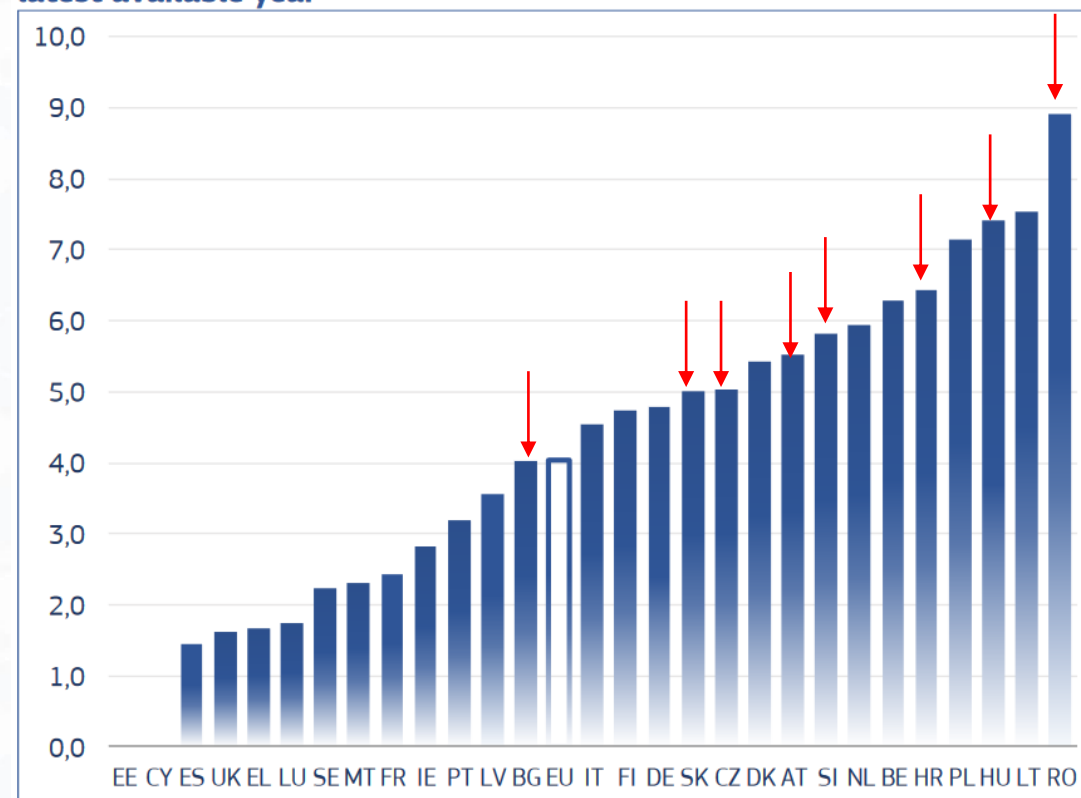
# Some statistics

**Figure 1: Number of cyclist fatalities and all road fatalities, EU, 2007-2016**



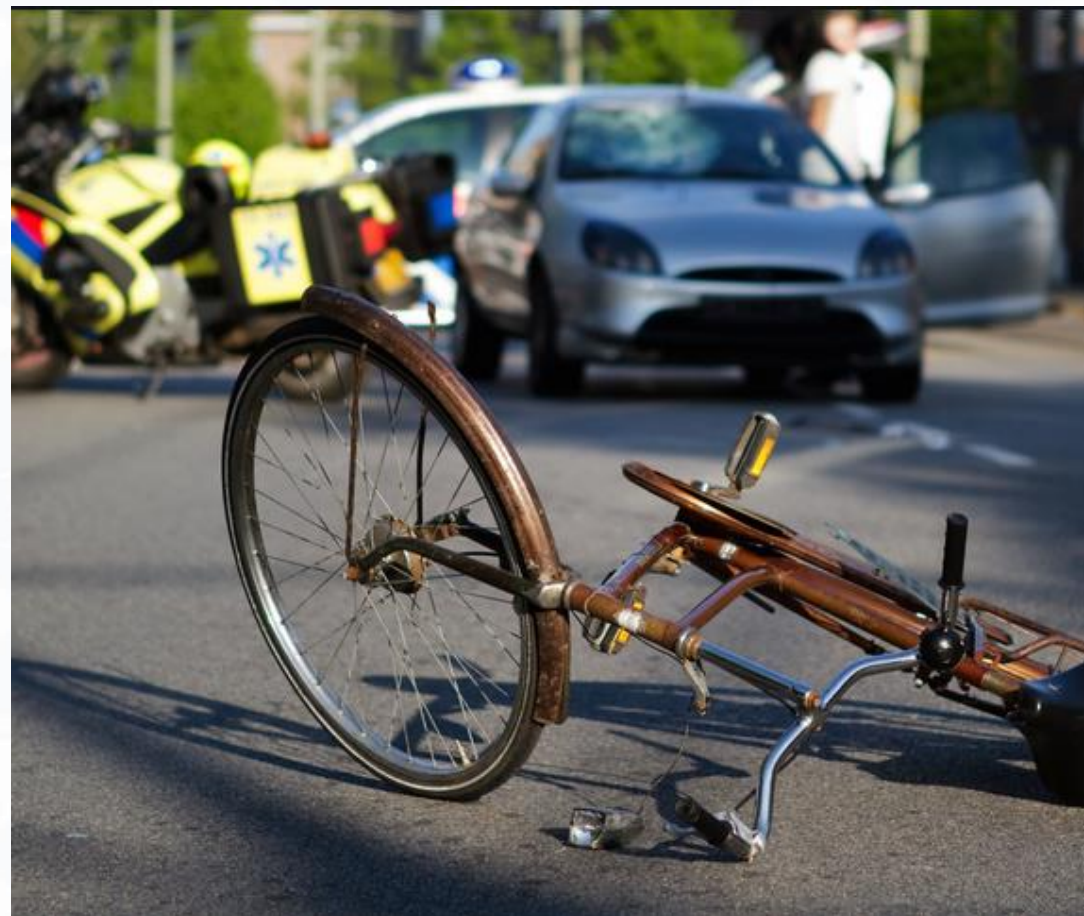
Source: CARE database, data available in May 2018

**Figure 3: Cyclist fatality rates per million population by country, 2016 or latest available year**



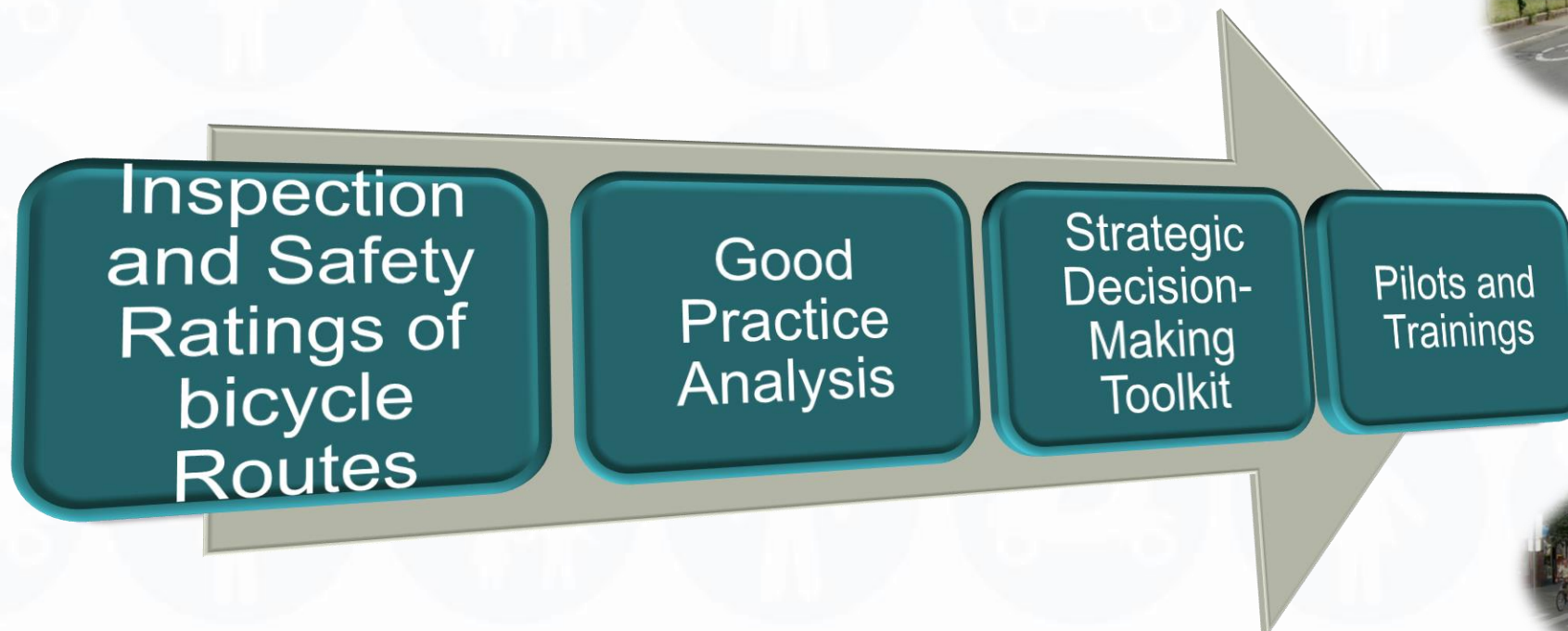
Sources: CARE database (EUROSTAT for population data), data available in May 2018

*European Commission, Traffic Safety Basic Facts on Cyclists, European Commission, Directorate General for Transport, June 2018.*



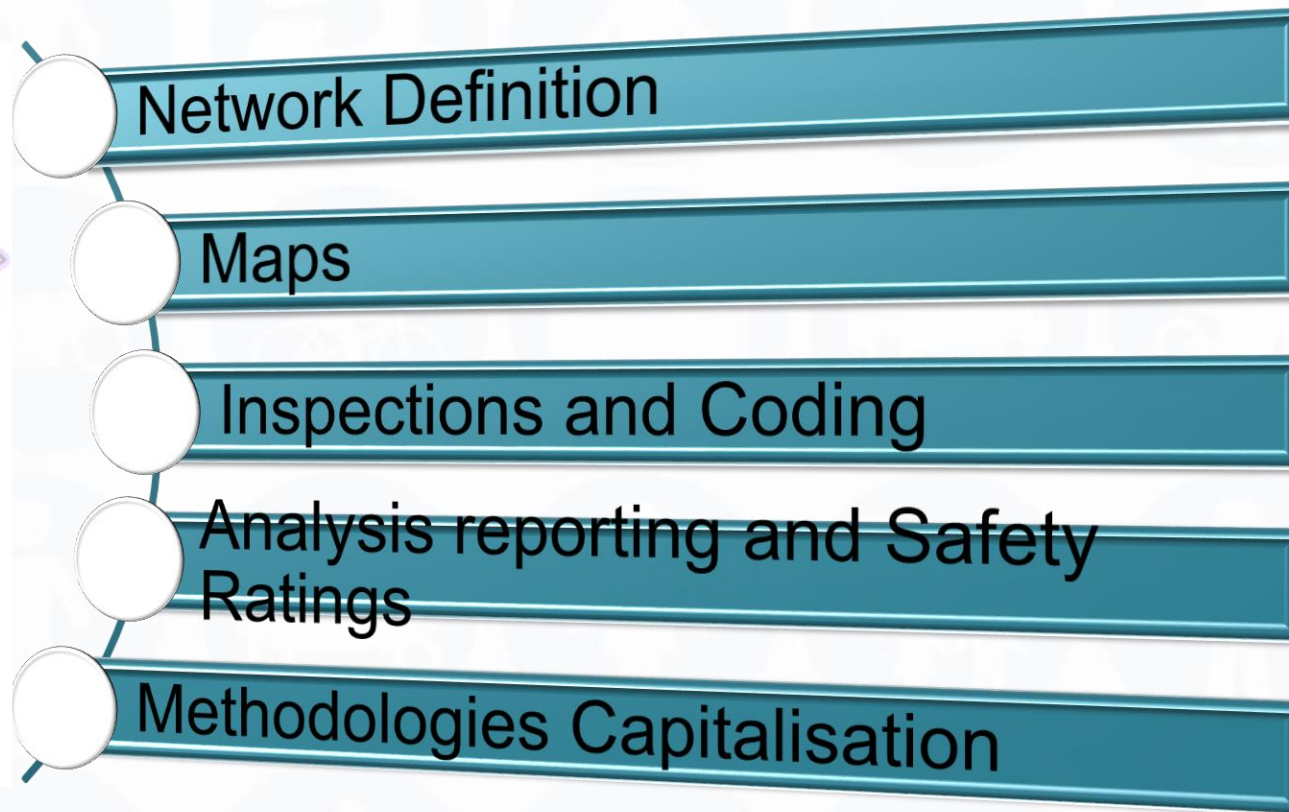
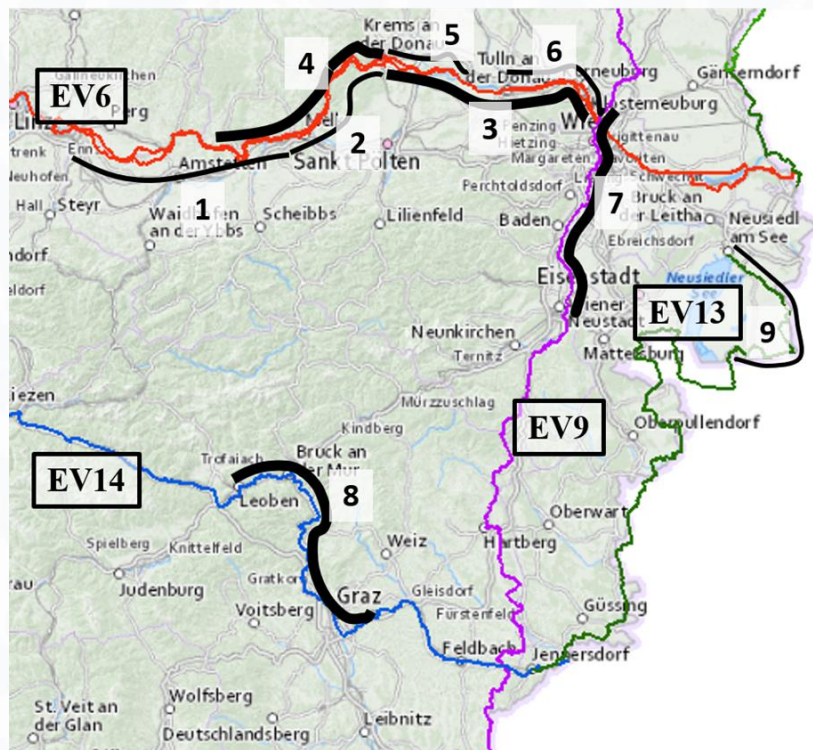


# Projects component parts



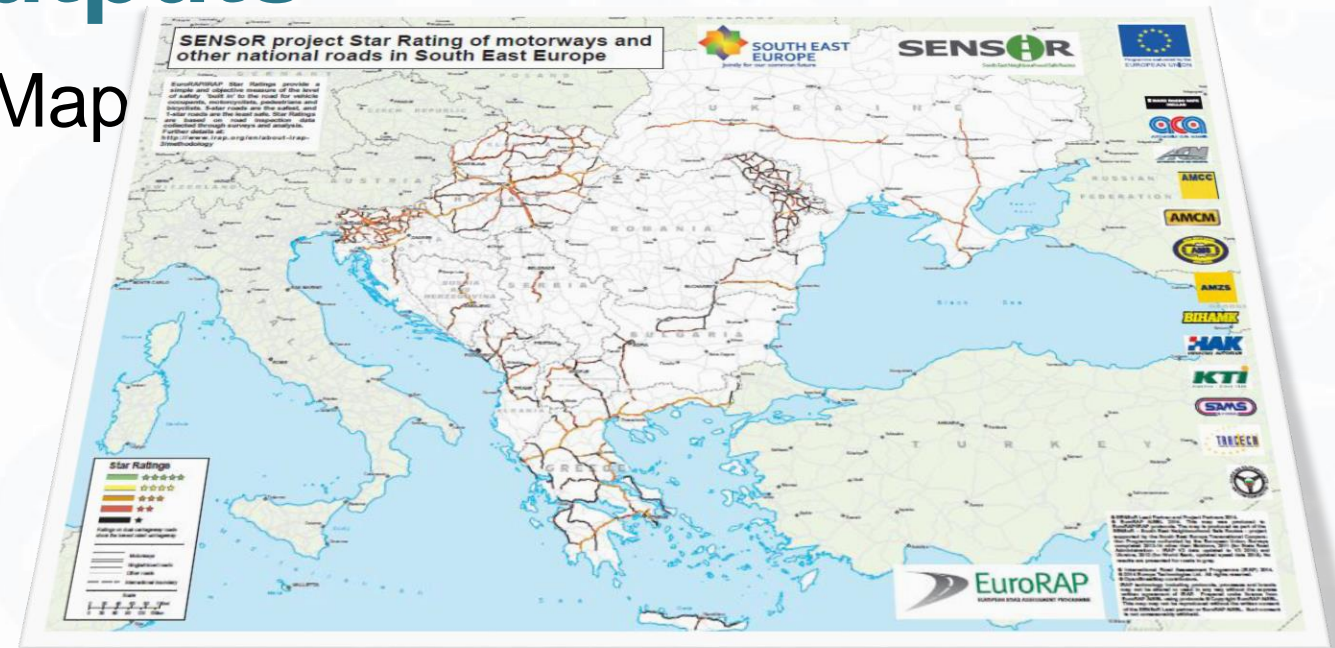


# T1: Inspection and Safety Ratings of Bicycle Routes



# T1: Inspection and Safety Ratings of Bicycle Routes- Outputs

- Infrastructure Star Rating Map
- Inspection database





# T2: Good Practice Analysis

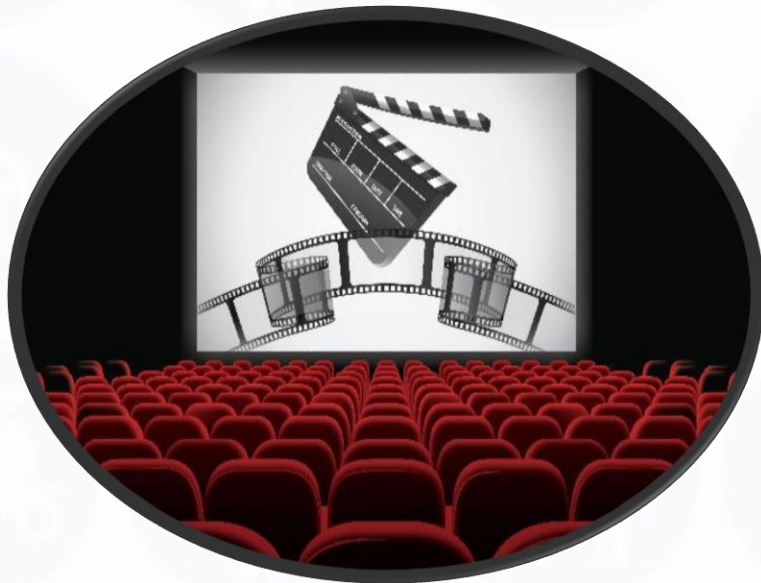
Analysis of data collected  
during surveys



Desk research

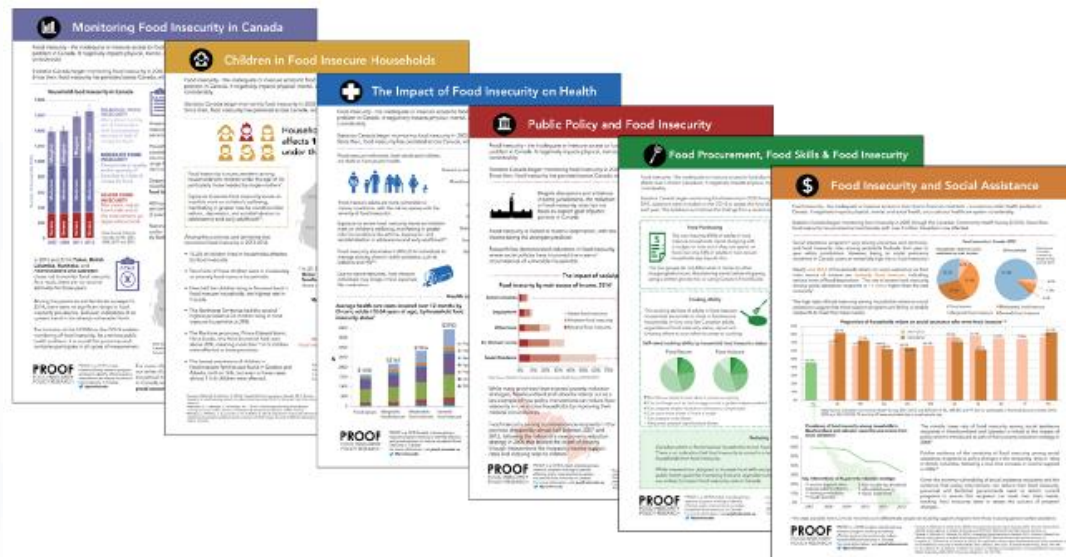


Stakeholders  
Consultations



# T2 Good Practices Analysis Outputs

- Best practice bicycle safety improvement fact sheets
- Recommendation for implementation of best practices
- National Consultations Report





# T3: Strategic Decision-Making Toolkit

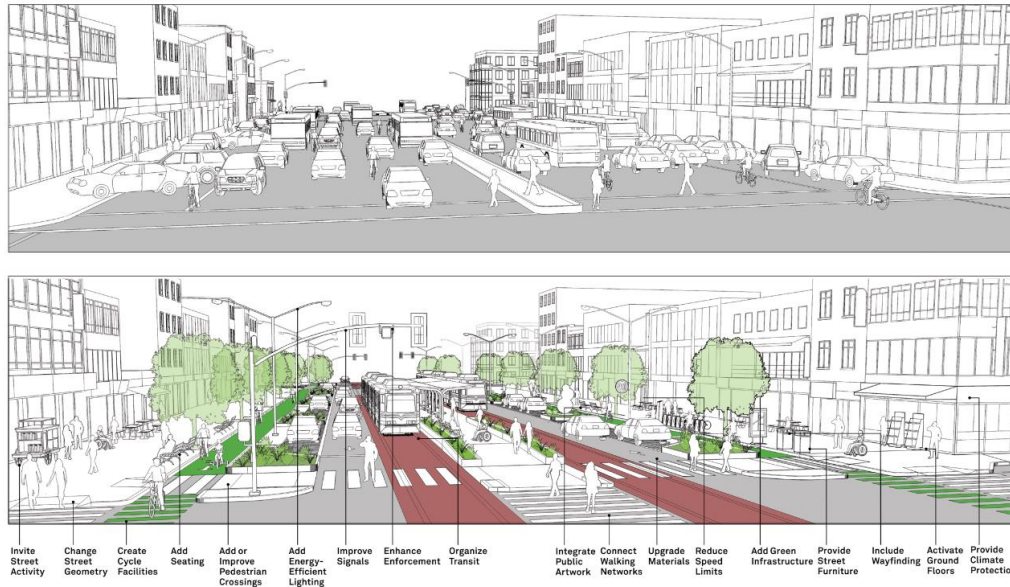


Photo: RAP Star Ratings of NACTO-GDCI's Global Street Design Guide

- AIM: To provide users of cycling infrastructure and road safety authorities and stakeholders with interactive web platform **Safe Cycling Routes Toolkit – SCRT** that will enable users to select recommended strategies and countermeasures for bicycle road safety improvements

# T4: Pilots and Trainings

Learning activities will combine trainings and pilot actions to demonstrate use of Safe Cycling Routes Toolkit

- Training course concept on improving bicycle road safety
- Training courses
- Cycling infrastructure safety improvement pilot activities
  - Missing link planning
  - Star rating of design
  - Safer cycling infrastructure



**IMPLEMENT** →



A vision and strategy  
aren't enough.  
The long-term key  
to success is  
***execution.***  
Each day. Every day.

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Richard M. Kovacevich