

# Making urban streets safer

Assessing the infrastructure for cycling and school zone safety using iRAP

Dr. Marko Ševrović

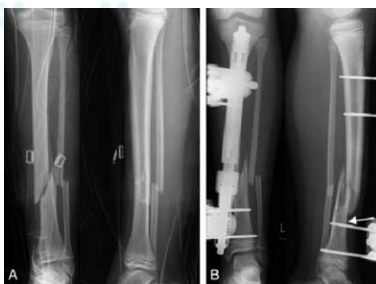
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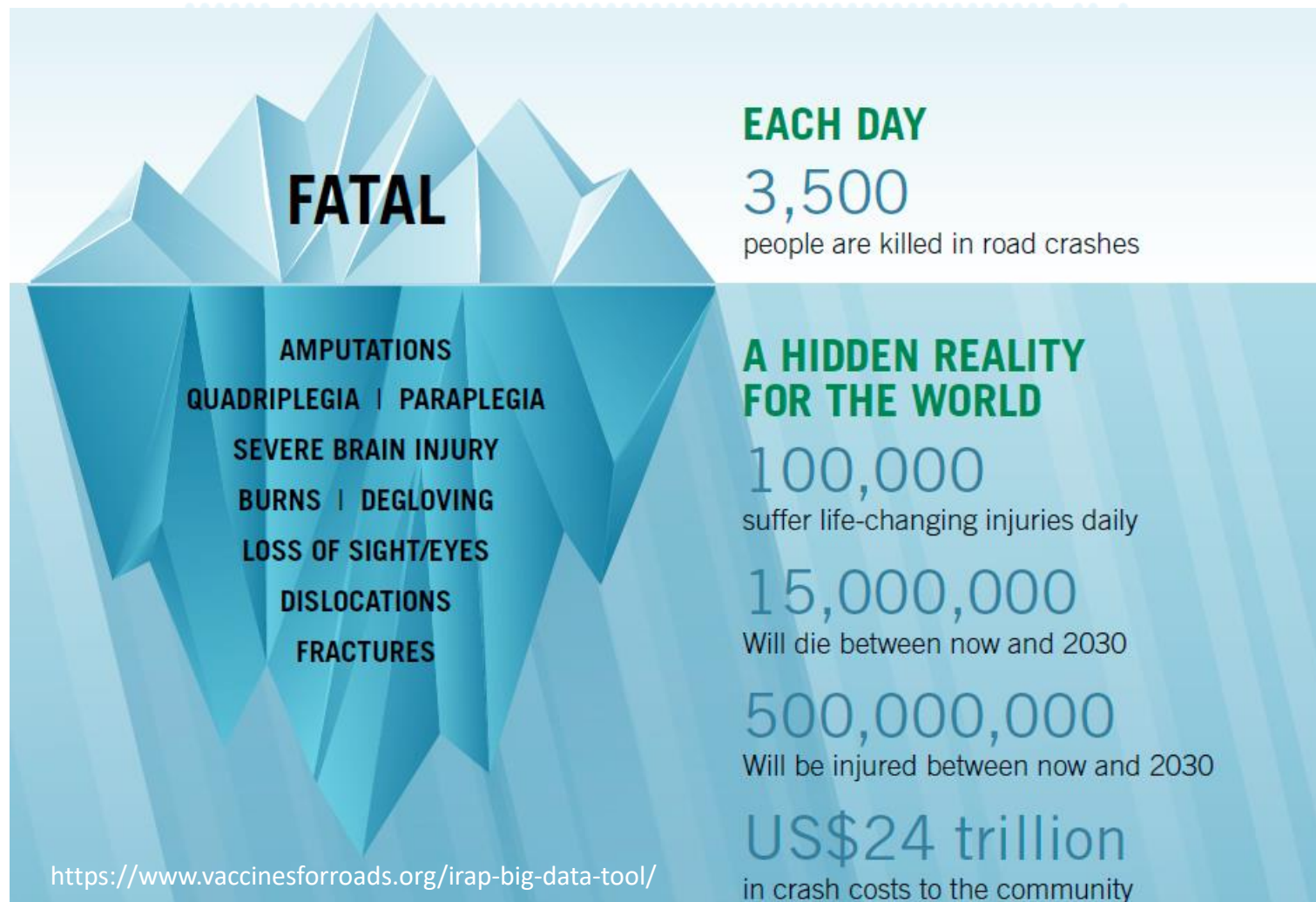
European Institute for road assessment EIRA – EuroRAP, Ljubljana, Slovenia,  
[marko.sevrovic@eira-si.eu](mailto:marko.sevrovic@eira-si.eu)

# Uninclusive Transport

## The New Human Impact of Road Trauma Every Day

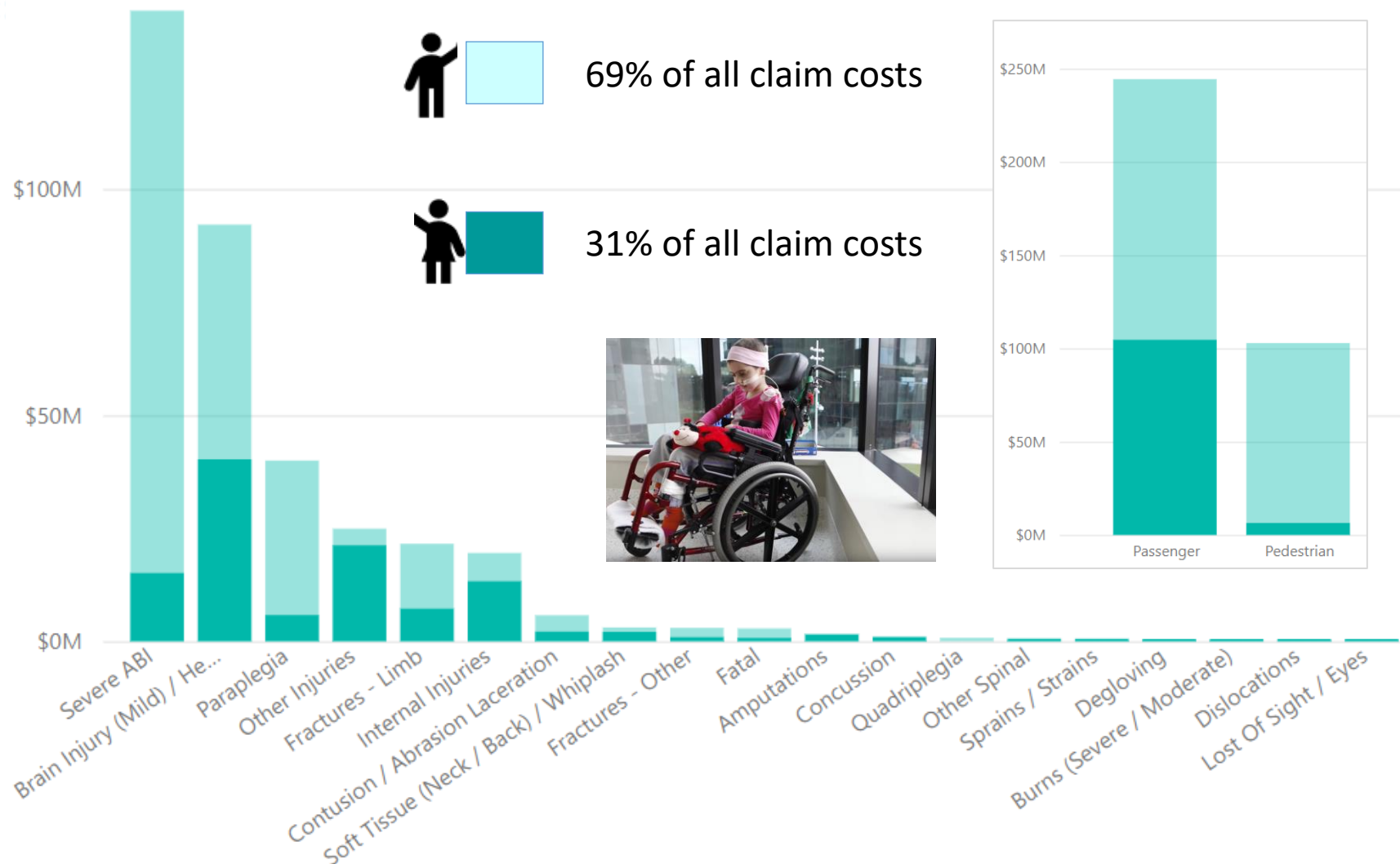


Vision Zero for the Balkans  
June 1 – 2, 2022



# Uninclusive Transport for our kids

## TAC claim costs for children 0-15 years old



All Pedestrians  
average claim cost



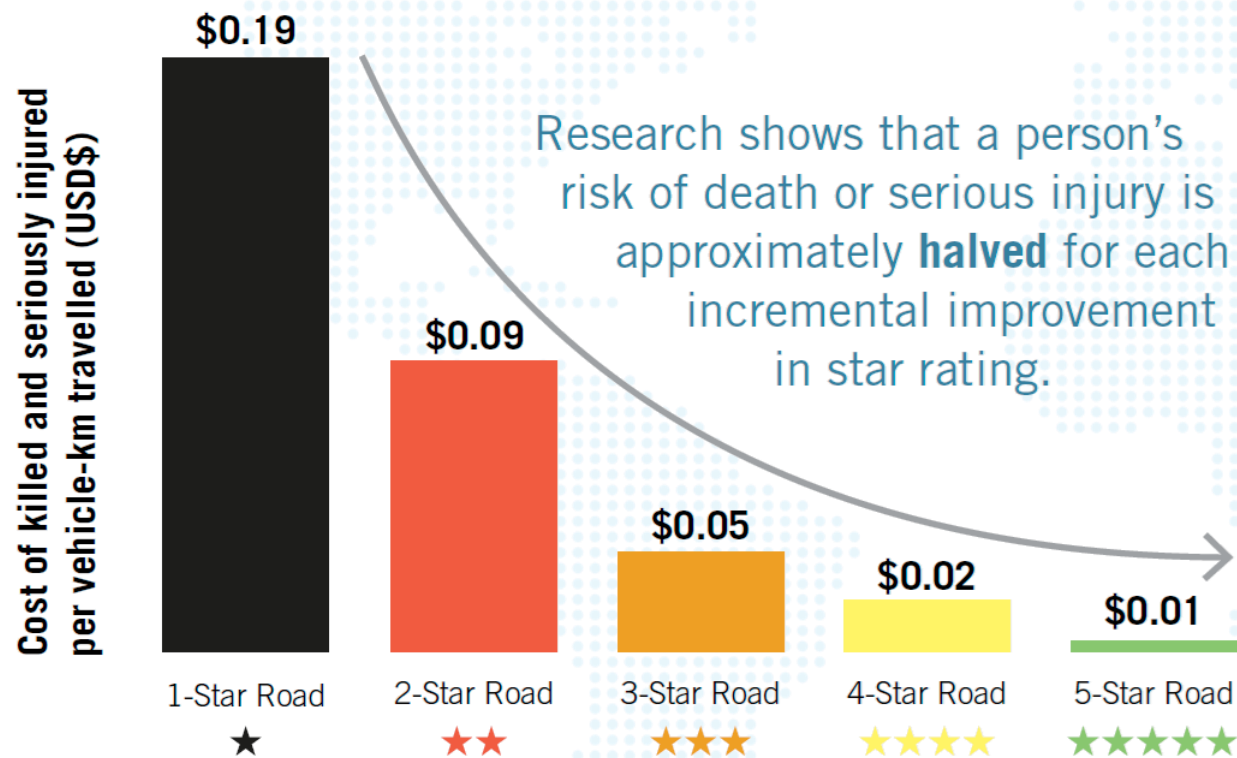
**\$240,000**



**\$36,000**

<https://www.tac.vic.gov.au/road-safety/statistics/online-crash-database/irap-road-injury-dashboard>

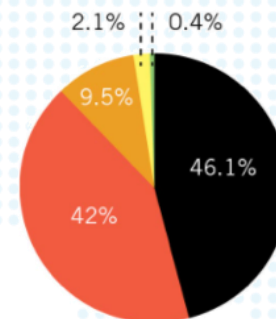
# Inequity by Mode



## Pedestrians



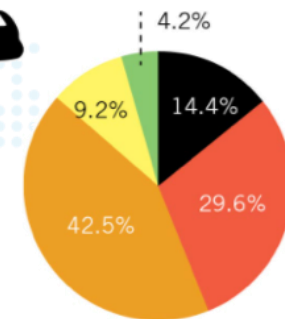
88%  
of travel is only  
1-2 stars  
for pedestrians



## Vehicles



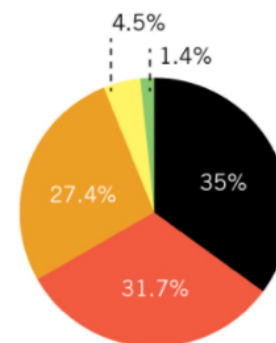
44%  
of travel is only  
1-2 stars  
for vehicles



## Motorcyclists



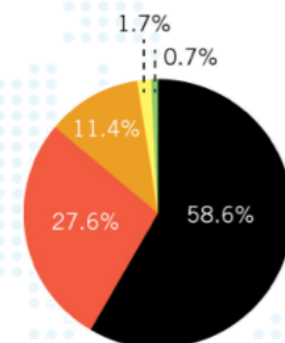
67%  
of travel is only  
1-2 stars  
for motorcyclists



## Bicyclists



86%  
of travel is only  
1-2 stars  
for bicyclists



★ 1-star ★★ 2-star ★★★ 3-star ★★★★ 4-star ★★★★★ 5-star

★ 1-star ★★ 2-star ★★★ 3-star ★★★★ 4-star ★★★★★ 5-star

# Global Road Safety Performance Targets



## NEW ROADS & STREETS

## EXISTING ROADS & STREETS

### GLOBAL PLAN

DECADE OF ACTION FOR ROAD SAFETY  
2021-2030

Calls for action on:



Multimodal transport  
& land-use planning



Safe road  
infrastructure



Safe vehicles



Safe road use



Post-crash response



TARGET  
**3**  
2030



Target 3: By 2030, all new roads achieve technical standards for all road users that take into account road safety, or meet a three star rating or better.

TARGET  
**4**  
2030

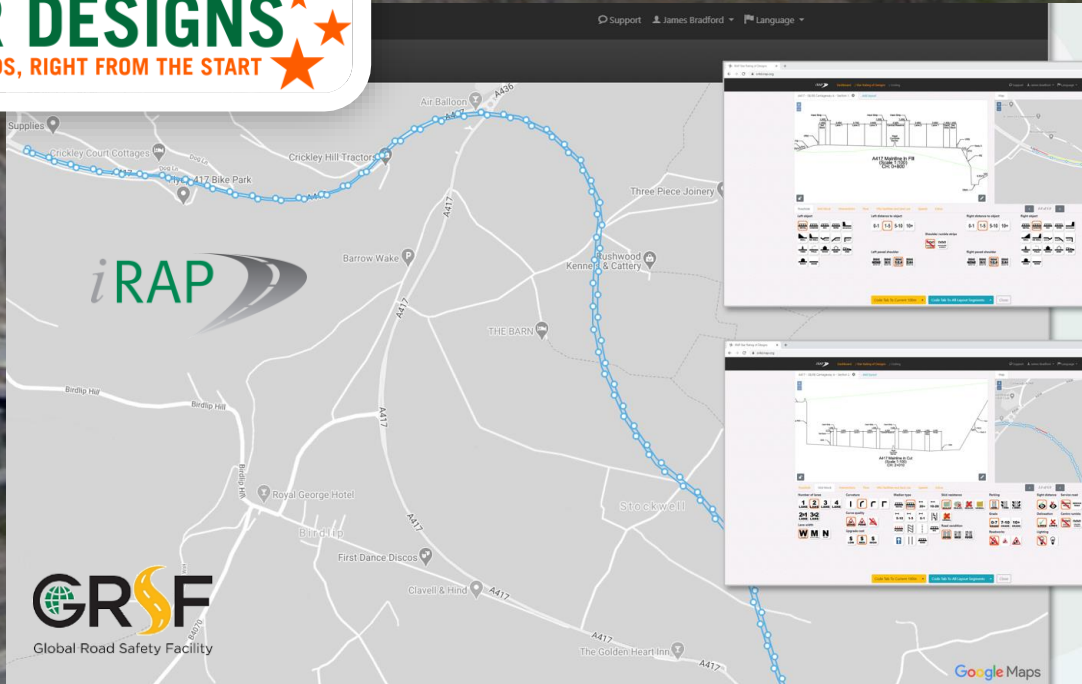


Target 4: By 2030, more than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.



# Innovation: Star Rating for Designs

**STAR RATING  
FOR DESIGNS** ★★  
SAFE ROADS, RIGHT FROM THE START ★



<https://irap.org/star-rating-for-designs/>



SUSTAINABLE DEVELOPMENT GOALS

TARGET  
**3**  
2030



Target 3: By 2030, all new roads achieve technical standards for all road users that take into account road safety, or meet a three star rating or better.



DESIGN		Impact over 20 year life of treatment		
Pedestrian Star Rating		Lives Lost	Brain Injuries	Fractures
Option 1	★	24	85	115
Option 2	★★★★★	2	7	12

# Innovation: 5-Star Cities for ALL

## Redesign IRAP Star Rating



<https://globaldesigningcities.org/2020/09/29/star-rating-your-street-plans-with-irap-and-the-global-street-design-guide/>

Pedestrian:



Bicyclist:



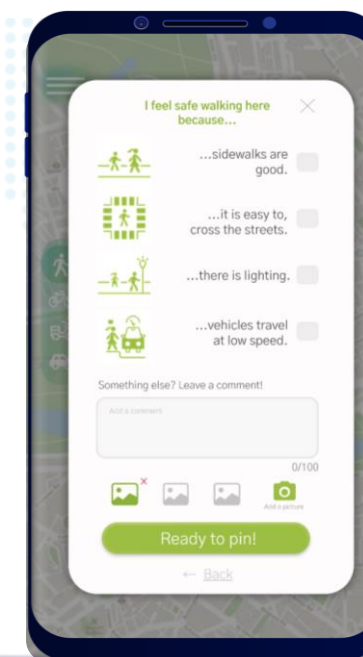
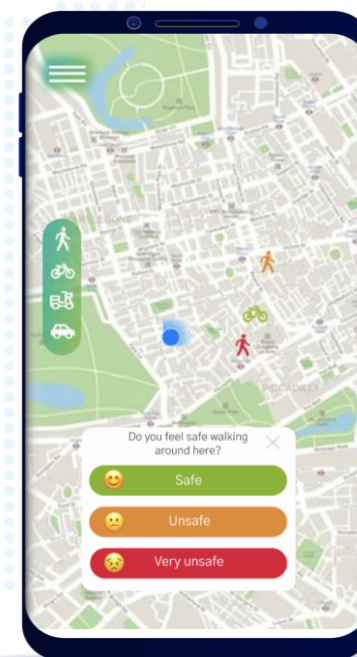
Shanghai





# Innovation: Including our kids

<https://www.starratingforschools.org/>



Young people's voices at the heart of the design

Vision Zero for the Balkans  
June 1 – 2, 2022



Start date

01-06-2018

End date

31-05-2021

Extended until end of  
November 2021



## ABOUT RADAR PROJECT

9

Project  
Partners

11

Associated  
Strategic  
Partners

12

Countries  
across the  
Danube area  
and UK

joining forces

...to **improve the road infrastructure safety** in the region by **raising capacity** and **enhancing transnational cooperation** in the sector for all road users.



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## 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

### 2 additional thematic areas reports and recommendation

- TRANSPORT SAFETY AND COVID-19
- RISM DIRECTIVE 2019/1396/EU IN DANUBE AREA

### 4 thematic areas reports and recommendations

Combined in a new road safety campaign: Better by RADAR (infographics)

### 4 Pilot Actions in 7 countries

Implementation ready concept plans

### 2 additional Pilot Actions in 2 countries

## Danube Infrastructure Road Safety Improvement Strategy and Action Plans

Vision Zero for the Balkans  
June 1 – 2, 2022






## Better Provisions for Vulnerable Road Users (VRUs)

Of all journeys in EU countries, up to 40 % are travelled by cycle or on foot.

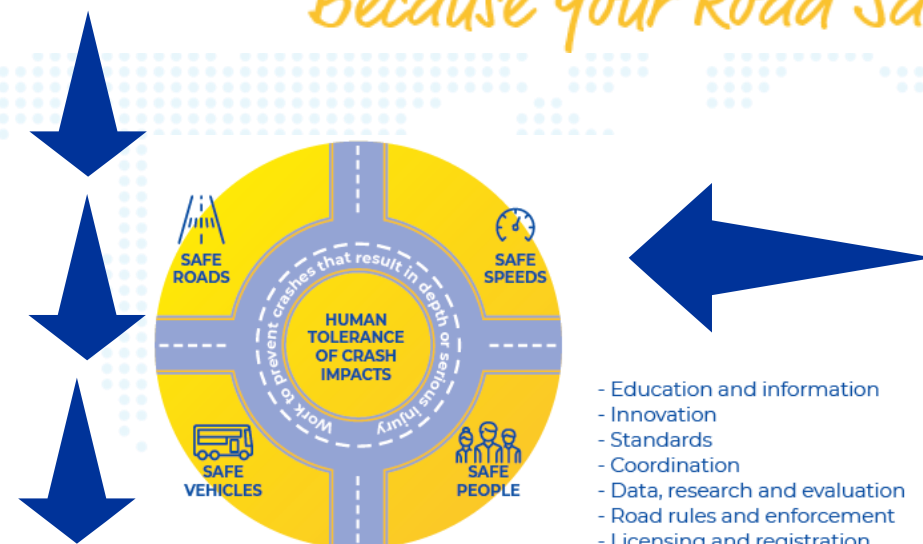
Focuses on locations where successful countermeasures for VRUs have been implemented and locations where the best opportunities exist to implement future countermeasures.

VRUs road fatalities in EU countries  
Years 2010 to 2018

	Total EU	Urban areas
	71%	30%
	72.5%	88%
	27.5%	12%
	29%	70%

# Better Provisions for Vulnerable Road Users

*Because Your Road Safety is on our RADAR.*



- Education and information
- Innovation
- Standards
- Coordination
- Data, research and evaluation
- Road rules and enforcement
- Licensing and registration

**SELECT ROADS  
FOR ANALYSIS** →



↓ **STAR RATING  
EXISTING ROAD**



↓ **GENERATE  
APPROPRIATE  
COUNTERMEASURE**



↓ **CALCULATE  
COUNTERMEASURE  
ECONOMICS**



**SELECT COUNTERMEASURES  
FOR IMPLEMENTATION** ○



← **PRIORITISE  
COUNTERMEASURE  
OPTIONS**



## How it's done?

The Star Rating system uses the international practice, where a 5-star road means probability of a crash occurrence, which may lead to death or serious injury is very low.

## RECOMMENDED BY RADAR PROJECT

### Recommendations for state governments/ministries/agencies:

- ▶ Incorporate the Safe System Approach.
- ▶ Develop a unified protocol for assessment of the crash risks of VRUs.
- ▶ Ensure that countermeasures selection, prioritisation, and implementation process is based on official and internationally acknowledged methodology.
- ▶ Define a national minimal standard threshold values of relevant road safety indicators based on which high-risk road sections for VRUs will be identified.
- ▶ Ensure that funds are invested in low-cost, high-impact countermeasures, by considering the concepts of tactical urbanism and space-wise planning.
- ▶ Develop and link datasets on road traffic accidents, traffic volume and road network.
- ▶ Try to link the police database on road traffic accidents with hospital data to minimize the under-reporting issue.
- ▶ Raise public awareness to improve the traffic culture.
- ▶ Share knowledge with demonstrations of good practices and approaches.

### Recommendations for local governments:

- ▶ Ensure that results obtained by road safety assessments performed at local level are standardized and comparable.
- ▶ Start systematic, high-quality road safety data collection and analysis to plan investments on most critical locations.

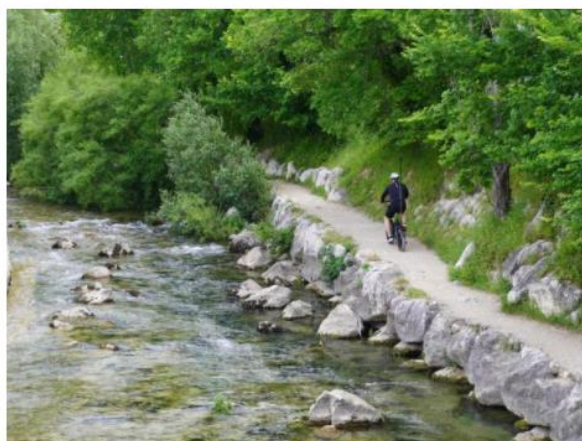
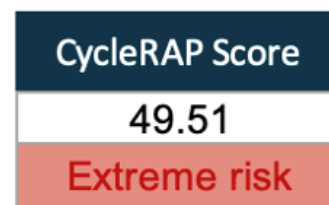
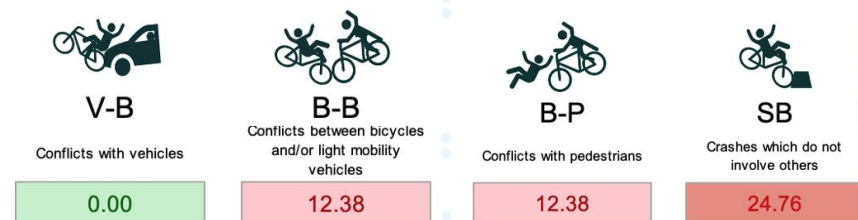
### Recommendations for road authorities:

- ▶ Use the official, standardized, objective methodology for selecting most critical locations for VRUs with highest potential savings.
- ▶ Ensure that provisions for VRUs are selected based on the operating speed of traffic flow and peak-hour flow volumes.
- ▶ Periodically collect relevant supporting data on characteristic locations on the road network and update relevant databases.
- ▶ Periodically perform analysis of effectiveness of implemented countermeasures for VRUs.
- ▶ Engage all stakeholders in the process of the road design.

<https://irap.org/innovation/>






**cycleraP**



<https://irap.org/cycleraP/>

*SABRINA: No fears about safety  
on two wheels.*

-  11 Project Partners
-  4 Associated Strategic Partners
-  9 Danube Area Countries



## SABRINA – Safer Bicycle Routes in Danube Area



### Project duration:

1 July 2020–31 December 2022

**Overall budget:** 2,086,019.00 EUR

EBRD contribution: 1,701,992.40 EUR

ENI contribution: 71,123.75 EUR

Project is being implemented in the framework of the Danube Transnational Programme (Interreg Danube).



# Bicycle route inspections: BULGARIA



More than 380 km of EuroVelo route no. 13 were surveyed in western and northern part of Bulgaria.



# Inspection and Safety Ratings of the Danube Bicycle Routes

Road Assessment  
Programme (RAP) protocols  
(iRAP and CycleRAP)

Bicycle Route  
inspections

European Certification  
Standard (ECS); European  
Cyclists' Federation (ECF)

**Coding:** More than 50 road design features known to influence crash likelihood and severity of injuries of road users and cyclists in the mixed traffic environment.

The **results**, including the iRAP Star Rating of the routes, will show us how safe the routes are for road users and cycling and what could be done to improve the road infrastructure to increase road safety for cyclists.





# Action: Big Data

# *ai*RAP

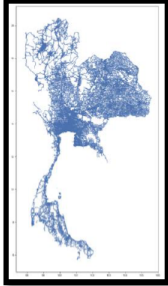
The *accelerated* and *intelligent* collection of RAP attributes



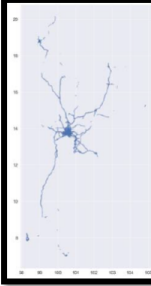
**Target 4:** By 2030, more than 75% of travel on existing roads is on roads that meet technical standards for all road users that take into account road safety.

**TomTom**

Thailand



Speed Limit	Km
20	7
25	4
30	99
35	2
40	131
45	26
50	217
60	391
70	12
75	3
80	6,712
90	6,207
100	8
110	0
120	416



- Total roads in Thailand = 308,340 km
- 75% of travel roads = 14,298 km
- 4.6% of the roads carry >75% of the travel



agilysis





NATIONAL  
ROAD  
SAFETY  
PROGRAMME

# NATIONAL ROAD SAFETY PLAN OF THE REPUBLIC OF CROATIA

FOR THE PERIOD 2021-2030

**PD10 Safe infrastructure**

- ✓ by 2030, all new roads should meet the required safety standards for all road users or have a three-star or better rating
- ✓ by 2030, existing roads carrying 75% of traffic should have a minimum three-star rating for all groups of road users, depending on the road category and the planned traffic load by user groups

Target

**PD10 Safe infrastructure**

- ✓ Percentage of road infrastructure above the established minimum safety standard\*

KPI

**PD10 Safe infrastructure**

- ✓ 35% of serious road traffic accidents are attributable to the infrastructure together with the human factor
- ✓ in 7% of serious road traffic accidents there was no vertical signing and horizontal marking
- ✓ about a quarter of the motorway network, including a third of the state road network and more than half of the county road network has a rating lower than three stars

Baseline



- implementation of preventive-educational and promotional activities;
- training of people working in road transport;
- elimination of black spots;
- road safety inspection (RSI), safety analysis of new and existing roads;
- safety analysis of new and existing roads (RSIA, RSA);
- design of a safe transport system;
- road infrastructure maintenance;
- technical solutions for driving in the opposite direction;
- research;
- investigation of road traffic accidents;
- implementation of the system of 'forgiving roads';
- deployment and improvement of ITS;
- addressing of railway level crossings used by vehicles and pedestrians;
- road safety audit;
- amendments to legislation.

## Activities

## Measures

Road safety inspection (RSI)	Carrying out regular (periodic) road safety inspections (RSI), including on roads outside the primary road network, with a focus on roads with higher traffic volume and/or increased frequency of road traffic accidents resulting in fatalities and/or serious injuries	MSTI, PRM, RSO, MI, LSGU, RSA	I., II., III.
	Carrying out dedicated road safety inspections (RSI) on roads with an established increased frequency of road traffic accidents resulting in fatalities and/or serious injuries	MSTI, MI, PRM, LSGU, RSA	I., II., III.
Safety analysis of new and existing roads (RSIA, RSA)	Performing activities related to the fulfilment of the requirement under which all recently designed roads should have a minimum three-star rating for all road user groups, depending on the road category and the planned traffic load by road user groups	PRM, MSTI, RSO, MI, LSGU, RSA	I., II., III.
	Making a safety analysis of the existing roads carrying 75% of traffic from the point of view of infrastructure risk arising from the existing situation	PRM, MSTI, RSO, MI, LSGU, RSA	I., II., III.
	Standardisation - applying European standards and/or defining national minimum technical standards, norms and guidelines of equivalent quality	PRM, MSTI, RSO, MI, LSGU, RSA	I.
	Analysing the possibility of raising the minimum technical safety standards of the existing road infrastructure	PRM, MSTI, RSO, MI, LSGU, RSA	I.



TARGET **3** | 2030

☆☆☆

**Target 3: By 2030, all new roads achieve technical standards for all road users that take into account road safety, or meet a three star rating or better.**

REDNI BROJ	OZNAKA	NALAZ / NAPOMENA	RAZINA RIZIKA	ODGOVOR NARUČITELJA	ODGOVOR REVIZORA
2.	Nalaz 2	<p><b>Nalaz</b> Na južnoj strani zapadnog prilaza, propust odvodnog kanala izveden je na način da čini bočnu opasnost. Predmetno također nije sukladno Nalazima prethodne revizije u Fazi 2.</p> <p><b>Prijedlog</b> Propust štititi zaštitnom odbojnom ogradom ili ga izvesti na način da ne predstavlja bočnu opasnost (nasipanje, betoniranje ili postavljenje čelične rešetke čime bi se osigurao nagib ne veći od 1:4).</p>	Visoka	<p>Prihvaća se, izveden je kosi čeon zid i povišem zemljani nasip.</p>	Prihvaća se.
		Prihvaćeno od strane Naručitelja: <u>DA</u> / NE / DJELOMIČNO			



22.83



4.63

TARGET  
**3**  
2030



Target 3: By 2030, all new roads achieve technical standards for all road users that take into account road safety, or meet a three star rating or better.

iRAP



# Thank you for your attention!

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