

Vision Zero for the Balkans

Day 2 – Safer Roads by Design

Day 1 – Key Takeaways (1)

- “We cannot rely on the conscience of drivers”
- “Road Safety should not be not a matter of luck”
- “Poor **road** infrastructure shouts at us. When roads **speak** to us, they save lives”
- “Road safety is the **common language** of the Balkans. We share common problems, we must also identify shared solutions”

Day 1 – Key Takeaways (2)

- Bulgaria must exploit these opportunities:
 - 3,000 km of primary roads are being rehabilitated every year
 - Advanced ITS assets already in place
 - Technological leapfrogging

What is in your top 10?

2100!

- 9,5% of 22,000*
- Network effects
- Incremental measures have a big impact.

* ESTC PIN Flash 26 (2019)

Safer Roads by Design

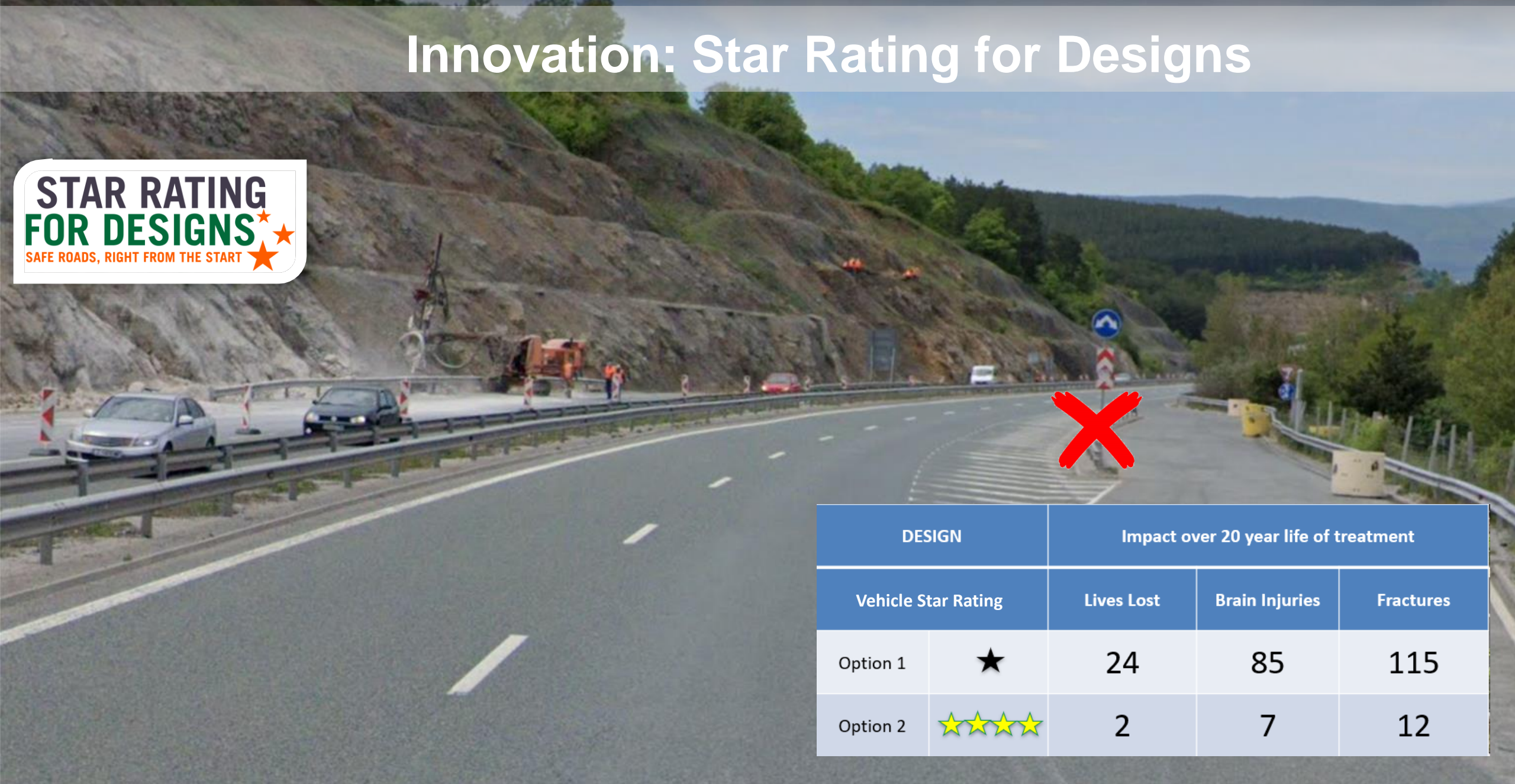
Road infrastructure and road surroundings are a contributing factor in more than 30 % of crashes.

Well-designed and properly maintained roads can reduce the probability of road traffic accidents, while “forgiving” roads (roads laid out on Safe System principles e.g. with median safety barriers to ensure that driving errors do not need to have serious consequences) can reduce the severity of accidents that do happen.



Innovation: Star Rating for Designs

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



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

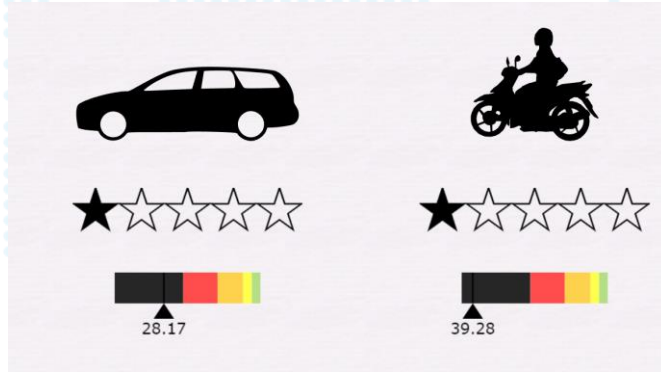
iRAP Demonstrator

Assumptions:

AADT 12000

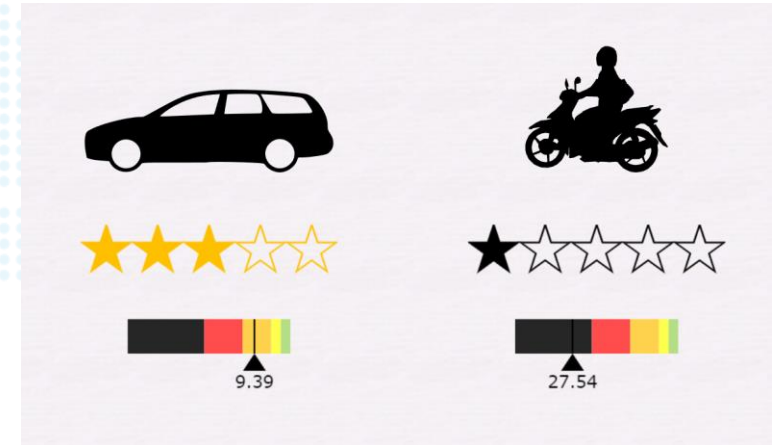
Speed limit: 140

Operating speed: 140



Upgrade:

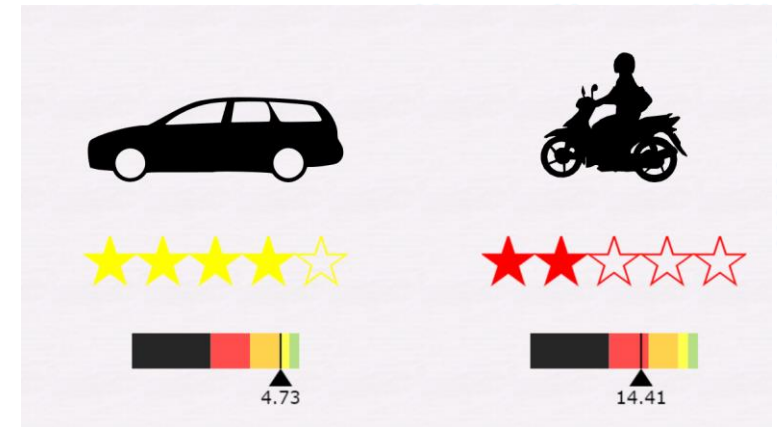
Fix guardrail ending - extend or remove guardrail



Install shoulder rumble strips / profiled markings



Reduce and enforce 120 km/h speed limit



Safer Roads by Design

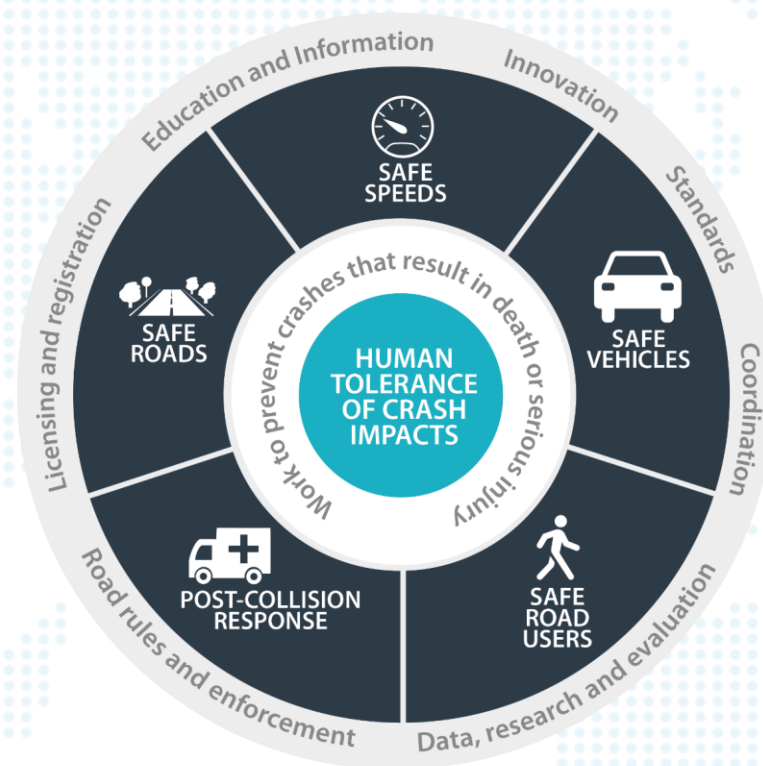
Bulgaria's safety strategy 2021-2030 sets 3 objectives for road infrastructure

1. Integrate road safety into road infrastructure management at national, district, and municipal levels to effectively limit the negative effects of the transport sector
2. “Maintain and develop **human error tolerant** republican roads ensuring universal mobility under the “**safe system**” approach
3. Maintain and develop low-conflict municipal road and street infrastructure with clear messages to road users and protection from urban risks

The Safe System Framework

The conventional approach to road safety is built on an expectation that people—of all ages and abilities—can safely use the road system if they obey the rules.

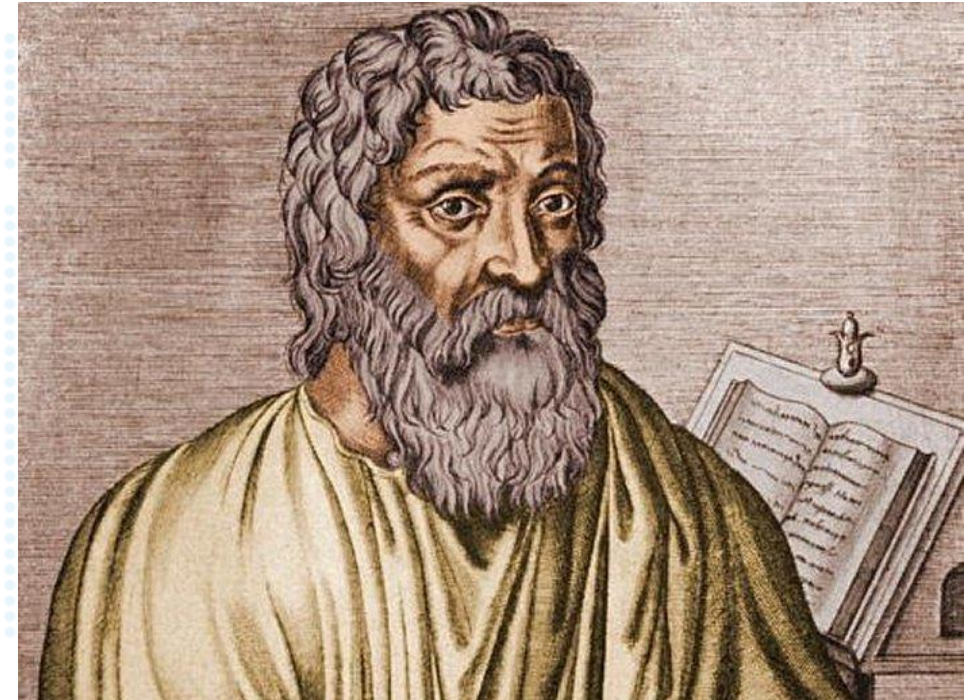
In a Safe System, roads are designed to accommodate predictable human limitations and behavior.



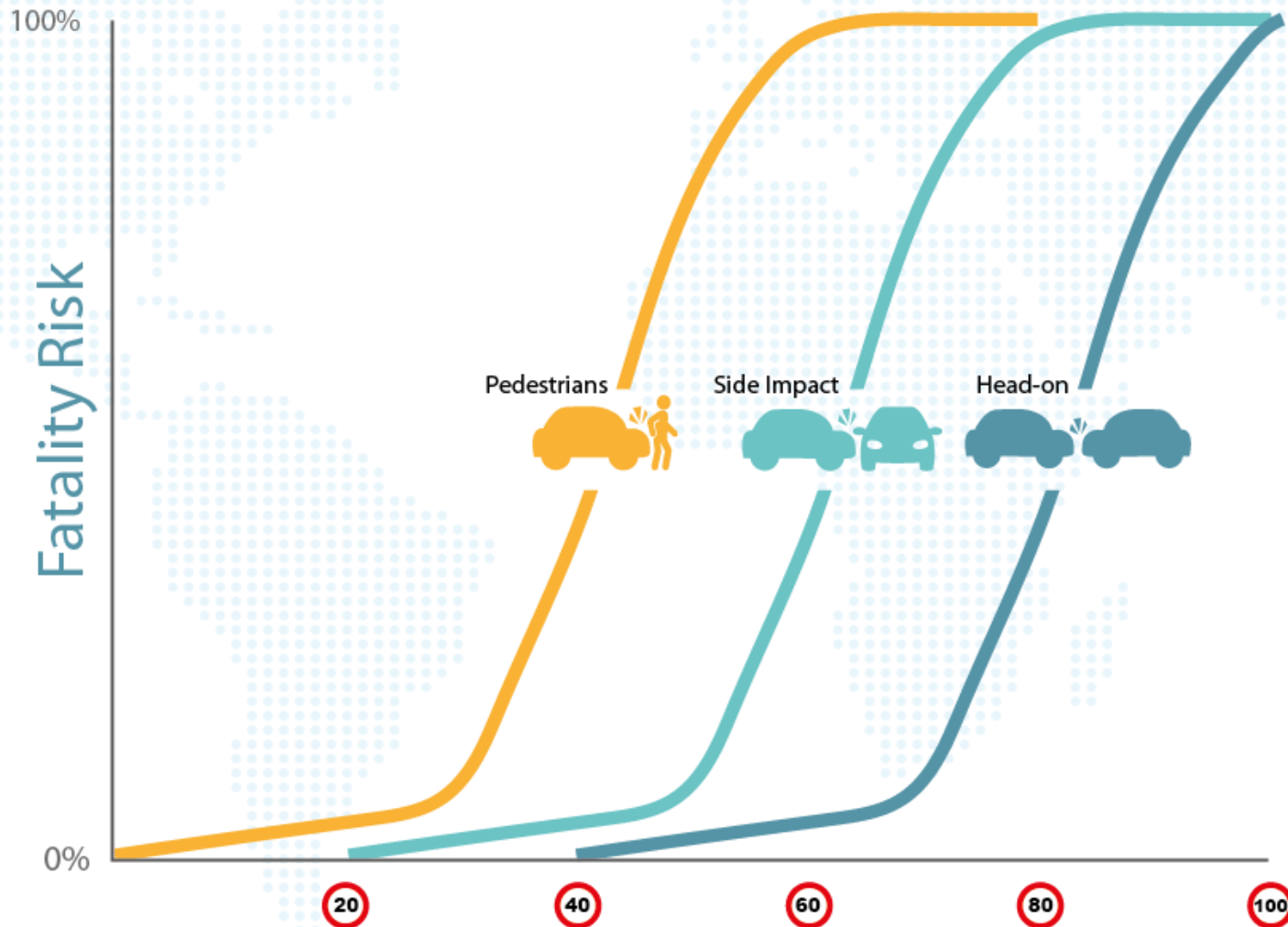
Human Tolerance

*He who falls from a **very high place** upon a **very hard and blunt object** is in **most danger** of sustaining a fracture and contusion of the bone...whereas he that falls upon **more level ground**, and upon a **softer object**, is likely to suffer **less injury** in the bone, or it may not be injured at all.*

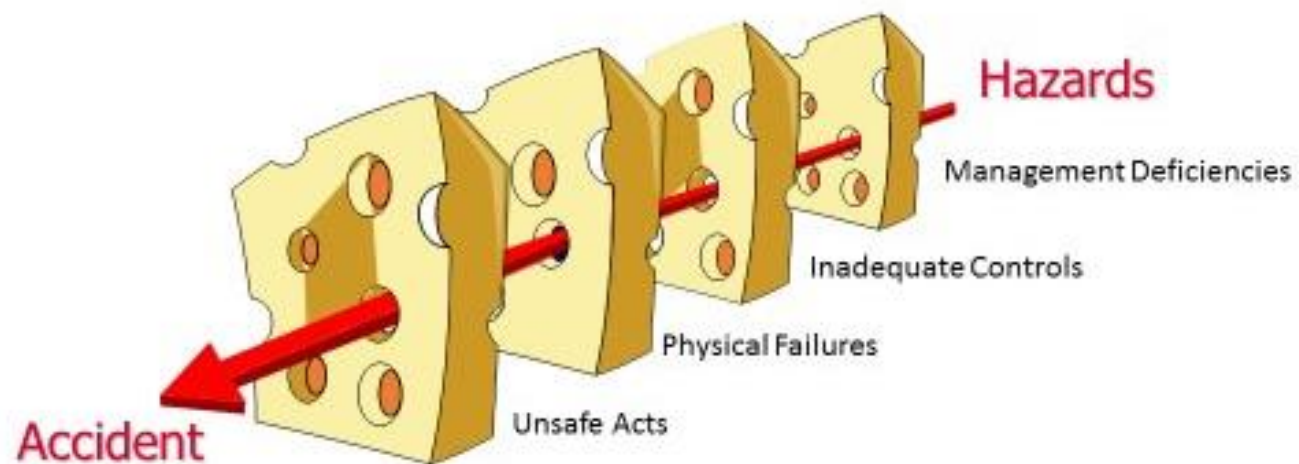
Hippocrates, *De capitis vulneribus* c. 400 BC



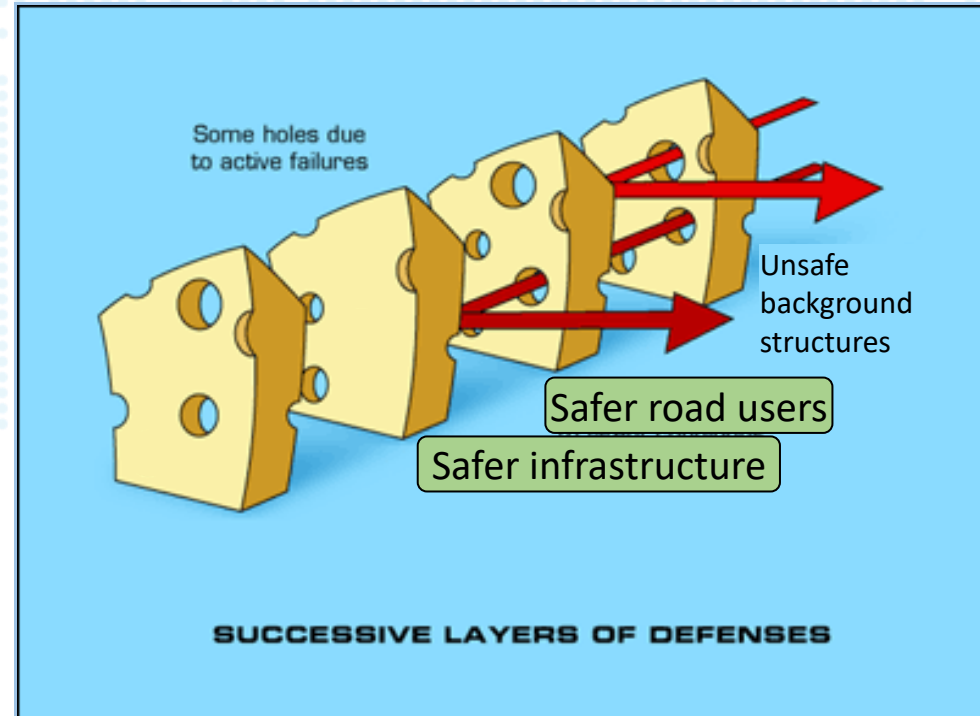
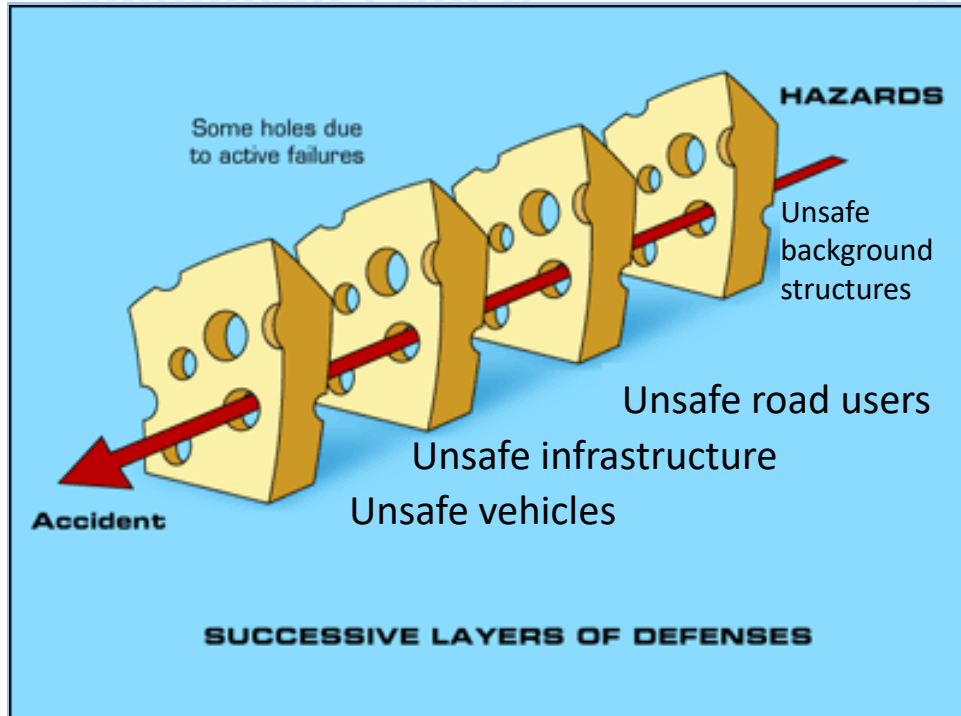
Human Tolerance



Human Tolerance



Human Tolerance



Today's Workshop

We will explore 4 “slices” of the Swiss Cheese model:

- Temporary Road Situations
- Vulnerable Road Users
- Active Safety Road Assets
- Passive Safety Road Assets



We will interact and work together to anchor our learning and develop solutions that are applicable to Bulgaria's road network

Today's Workshop



Safe Workzones:

- Nenad Nikolic
- Thomas Keller



Safe PTWs:

- Marten Hiekmann

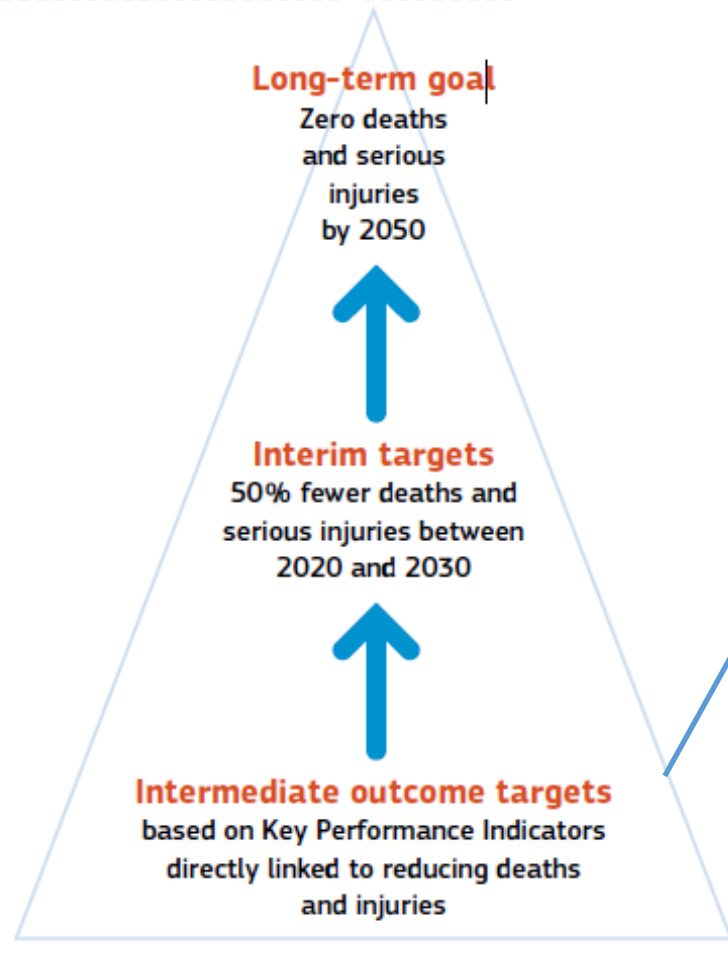


Well maintained assets:

- Dr. Darko Babic
- Fernando Ribeiro



Where do we go from here?



Key Performance Indicators

Speed

Safety Belts

Protective Equipment

Alcohol

Distraction

Vehicle Safety

Infrastructure Safety:

Post-Crash Care



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.

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.

Activities



Where do we go from here?



Technical Committees



Classroom & Online Training



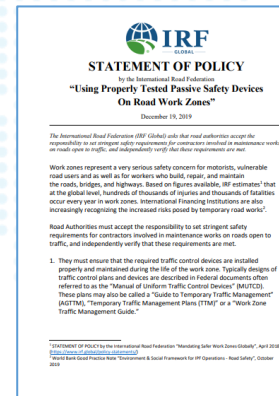
Study Tours



Industry Innovation



Guidelines



Research

