

Star Rating Maps - The Case in Serbia

The inspected road from Belgrade to Cacak is a part of the international road IA-2, i.e. M-22 road. It includes 13 sections and the total length of 131,1 km.

The following figures contain some of the hazardous objects in the roadside area, as well as unsafe engineering measures.



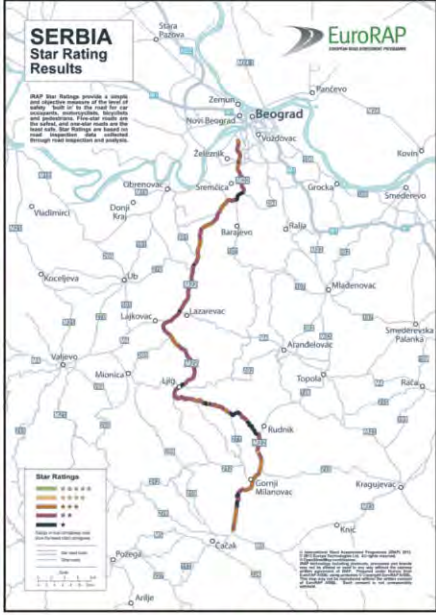
Unsafe ends of safety barriers



Unprotected electricity poles



Unsafe curve



Serbia (A-2 (M-22))
Total length 141km

Safer Roads Investment Plan

Total FSIs Saved	Total PV of Safety Benefits	Estimated Cost	Cost per FSI saved	Program BCR
1,100	4,915,198,181	3,067,039,850	2,679,149	2

Countermeasure	Length / Sites	FSIs saved	PV of safety benefits	Estimated Cost	Cost per FSI saved	Program BCR
Shoulder barriers - driver side	52.1 km	200	1,028,664,553	802,845,000	3,981,015	1
Shoulder variable stripe	131.6 km	200	891,786,208	178,640,700	860,175	5
Central median barrier (1+1)	14.1 km	100	513,222,248	290,244,000	2,428,154	2
Additional lane (2 = 1 road with barrier)	1.5 km	60	268,820,044	234,270,000	3,741,739	1
Fourpass provision passenger side (+3m from road)	16.3 km	60	258,651,677	210,777,300	3,485,389	1
Fourpass provision driver side (+3m from road)	16.5 km	50	246,705,889	216,014,000	5,756,424	1
Improve Delineation	24.5 km	40	182,777,989	54,701,200	1,284,566	3
Central median barrier (no duplication)	3.7 km	40	212,488,983	153,268,900	3,098,924	1
Roadside barriers - passenger side	12.0 km	40	212,002,488	185,364,000	3,754,075	1
Protected curve lane (unsignalled 4 reg)	3 sites	20	86,809,866	61,025,500	5,016,783	1

Safer Roads Investment Plan in Serbia

SENSoR project produces comparable results

By adopting the RAP methodology the SENSoR project enables the comparison of the SEE road network safety capacity at a global level.

RAP Programmes have been implemented:

- In 90 countries worldwide
- 650.000kms have been measured and mapped



Assessing the roads safety in South East Europe Working for a SEE Free of High Risk Roads



EU road safety with no borders

A Safe pan-European road network is the backbone of the sustainable transport system capable of delivering fast, affordable and reliable transport solutions in Europe. The free movement of people and goods is a noble European goal and the decision by EU nations to develop trans-European networks is a practical expression of it. EU nations have committed themselves to ensure "...the sustainable mobility of persons and goods under the best possible social, environmental and safety conditions."

Safety is the primary concern of any European traveller exercising "freedoms" guaranteed by the EU integration process. Combining freedoms with safety transnational approach brings greater value because it:

- Improves accessibility through making access across borderless Europe safer
- Encourages the introduction of coordinated methodologies and policies involving national and international stakeholders
- Provides opportunity for convergence of current practice reinforcing the needs for harmonisation at EU level
- Creates a system of benchmarking by encouraging cooperation and involving countries with differing road safety performance and different ways of addressing varying risk on roads

From measurement of road safety conditions in South East Europe to national actions - the SENSoR Project

As SENSoR builds its Road Safety Atlas for South East Europe, the safety performance of Europe's roads is becoming more transparent. The idea of mapping the safety of our roads to common standards is proving highly effective. As each country is added, more of Europe's citizens, policy makers and road engineers can share a common understanding about where the risky roads are. These results are helping build awareness in public, policymakers and professional engineers about the variable safety performance of Europe's road infrastructure.

As a result, SENSoR is stimulating a new, practical and informed debate about what can and should be done, given the high economic returns available from reducing road crashes. Many countries in Europe are choosing to use measurements devised by EuroRAP with support from the European Commission in developing their own national road safety action plans. By doing so, they can see whether their roads are getting safer over time and how well they are doing compared with other countries.

The vision for the South East Neighbourhood Safe Routes (SENSoR) project is "to build a South East Europe free of high risk roads". The project builds on outstanding cooperation among automobile clubs, research institutes and authorities in the South East Europe region. Together they are committed to identifying high risk roads using consistent and standardised Road Assessment Programme (RAP) technology and methodology, measuring and mapping the safety of roads and raising awareness among civil society and professionals alike of the importance of safe road infrastructure. The SENSoR project builds on the already established and well advanced Road Assessment Programme (RAP) methodology that includes protocols related to the development of Risk Maps, based on recorded deaths and serious injuries and traffic censuses, the safety rating of the infrastructures (Star Rating) and the development of "bank ready" high-return Safer Roads Investment Plans (SRIP).

Bank Ready Safer Roads Investments Plans

Where Star Ratings provide a measure of risk on a road, Safer Roads Investment Plans identify ways in which the Star Ratings can be improved in a cost effective way.

EuroRAP protocol considers more than 70 proven road improvement options to generate affordable and economically sound Safer Roads Investment Plans that will save lives. These road improvement options range from low-cost road markings and pedestrian refuges to higher-cost intersection upgrades and full highway duplication. Indicative recommended engineering countermeasures for improving safety of the inspected road in Serbia are presented in the next figure.

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MAKE ROADS SAFE HELLAS

SOUTH EAST EUROPE Transnational Cooperation Programme

SENSoR South East Neighbourhood Safe Routes

Programme co-funded by the **EUROPEAN UNION**

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The Road Trauma in SE Europe

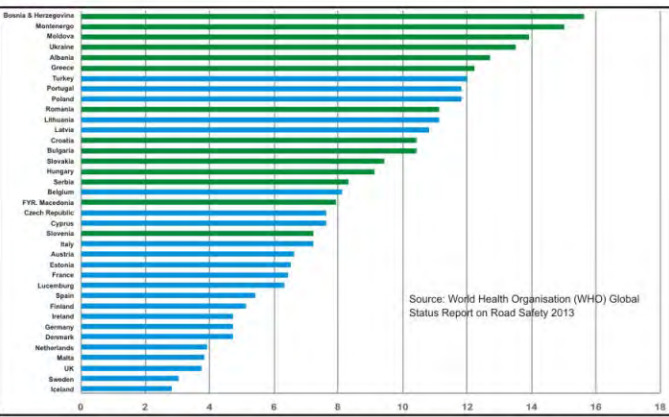


In last 10 years

100.000 deaths on roads

1.000.000 seriously injured

Every hour 1 person is killed on the SEE roads and 10 may not survive or suffer for the entire life

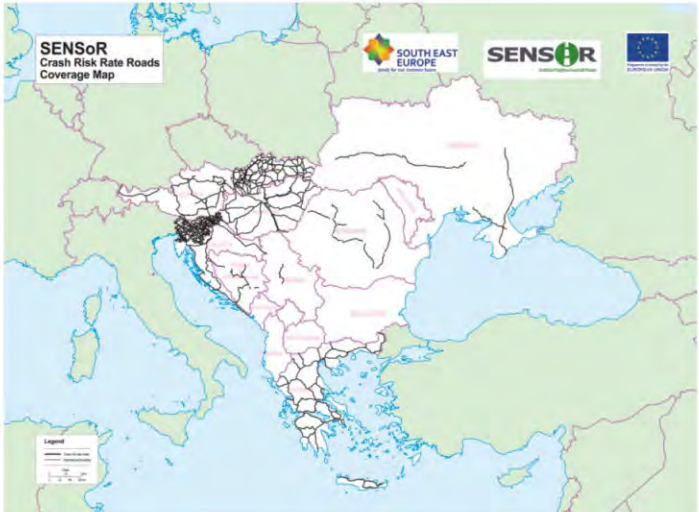
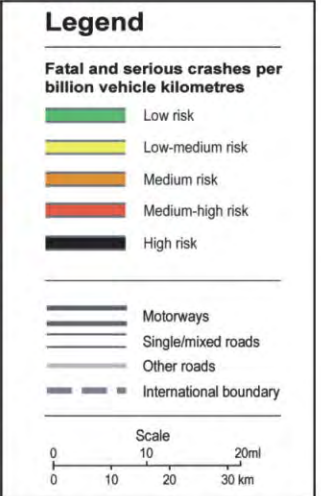


Road Death Rate per 100,000 people

Risk Mapping

In countries where detailed crash and traffic data are available, RAP risk maps give an objective view of where people are being killed or seriously injured on a road network and where their crash risk is greatest. They capture the combined risk arising from the interaction of road users, vehicles and the road environment. Road sections are allocated into colour-coded categories from high risk to low risk.

Almost 19.000 km of roads in South East Europe has been assessed within the SENSOR project including roads in Greece, Slovenia, Hungary, Slovakia, Romania and Serbia.



Country	Coverage (app.)
Greece	4.600 km
Slovakia	5.000 km
Slovenia	2.225 km
Hungary	6.100 km
Romania	1.000 km
Total:	18.925 km

Risk Mapping coverage in the SENSOR project

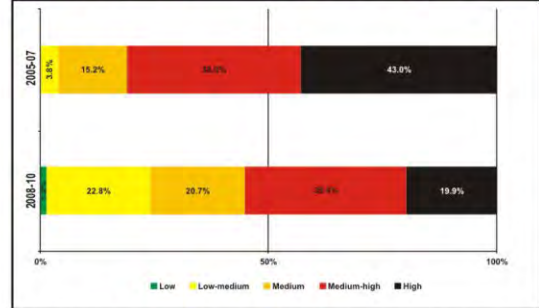
Risk Maps - The Case in Greece

The developed Risk Map for Greece covers 4.600 km of the TEN-T road network for the period 2008-2010.



Risk Map 2008-2010 for Greece

Roads performance tracking in Greece



The results show lower risk rates (related to the previous time period assessed) mainly wherever infrastructure has been upgraded.

Inspecting & Rating Roads

Star Ratings are based on road inspection data and road design risk factors. They provide a simple and objective measure of the level of safety 'built-in' to the road. Five-star roads (green) are the safest, and one-star (black) are the least safe.

Using specially equipped vehicles, software and trained analysts, SENSOR inspections focus on more than 30 different road design features that are known to influence the likelihood of a crash and its severity. These features include intersection design, road cross-section and markings, roadside hazards, footpaths and bicycle lanes.



Using EuroRAP protocols, SENSOR Project Partners achieved a survey of more than 15 000 km of various roads in countries of the South East Europe. Approximately 90% of roads surveyed are part of TEN-T network while the other 10% represents dangerous regional roads.



Star Rating Mapping coverage in the SENSOR project

Full mapping results will be available in September 2014

Country	Coverage	Country	Coverage
Greece	3.500 km	Serbia	138 km
Slovakia	2.500 km	FYROM	548 km
Slovenia	3.150 km	Bosnia & Herzegovina	352 km
Hungary	3.000 km	Montenegro	555 km
Bulgaria	620 km	Albania	533 km
Romania	540 km	Croatia	481 km
Total:	15.917 km		