

# ROAD TRAFFIC SAFETY PERFORMANCE IN MONTENEGRO

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**Abstract:** According to WHO, more than 1.2 million people die in road traffic crashes every year and 50 million are injured or disabled. Over the last decade nearly all EU countries record a decrease in number of traffic casualties. However, in the same period Montenegro's figures generally point in opposite direction. The fatality rate on Montenegro's roads, measured as deaths per capita, is 50% higher than that of EU average; however, car ownership in Montenegro is considerably lower than the EU average. Having traffic safety figures so bad, efforts have been made in recent years to address this issue.

**Keywords:** TRAFFIC ACCIDENTS, ROAD DEATHS, (COUNTER) MEASURES

## 1. Introduction

More than a million people die each year on the world's roads. According to World Health Organization (WHO), approximately 1.24 million people die every year in car accidents and more than 50 million are injured, /1/. Road traffic injuries take an enormous toll on individuals and communities as well as on national economies. At the national level, road traffic injuries result in considerable financial costs, particularly to developing economies. It is estimated to cost countries up to 4% of their gross national product. In high-income countries, number of road deaths is decreasing in last few years, but low-income countries, such as Montenegro, saw increases over the same period. Current trends suggest that by 2030 road traffic deaths will become the fifth leading cause of death unless urgent action is taken.

Road safety in Montenegro is at low level. One of primary reasons is poor road infrastructure. Montenegro has a road network totaling approximately 7,000 km – with approx. 900 km of main and primary roads, 950 km of regional and secondary roads, and around 5,000 km of local roads. This is equivalent to a road density of 500 km per 1,000 km<sup>2</sup>. This figure is broadly consistent with the density of some new EU member states (see Table 1), /2/. Regarding road infrastructure quality, Montenegro ranked only 107<sup>th</sup>, of 131 countries surveyed, for the quality of its road infrastructure. 90% of Montenegro's road network is high risk, including those segments with a high traffic volume, /3/. Also, 47% of the entire road network is in poor or very poor condition, reflecting inadequate maintenance. To improve the road safety situation on the main road network, costs an estimated €105–138 million.

**Table 1** Road network density

	Road density	
	km of roads per 1000 km <sup>2</sup>	km of roads per 1000 inhabitants
<b>Montenegro</b>	500	11.1
Southeast Europe, average	555	5.9
Albania	657	3.5
Bosnia and Herzegovina	427	5.6
FYR Macedonia	513	6.4
Serbia	500	5.2
New EU member states	1427	19.9
Czech Republic	1646	12.5
Estonia	1320	41.2
Hungary	1733	15.7
Slovenia	1007	10.2
Croatia	506	6.4

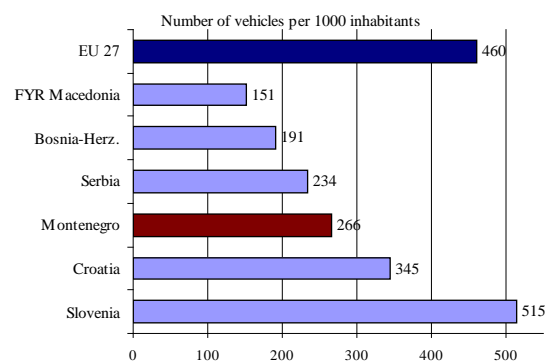
Other factors, such as the distribution and density of population and the country's geography, play a considerable role in determining country's road network. These effects become evident when making the comparison on a different measure of road density – viz. road kilometers per 1,000 people.

With this measure, with more than 11 km of road per 1,000 inhabitants, Montenegro is ahead of most of its regional comparators and comparable to those of the new EU countries, /5/.

**Table 2** Number of vehicles in Montenegro

	2010	2011	2012	2013
Registered cars	164653	171973	173865	178662
per 1000 inhabitants	266	277	279	286

During last few years, the number of registered vehicles is around 200,000 counting all vehicles category and about 85% are passenger cars. The rate is approx. 286 passenger cars per 1,000 populations, (see Table 2), /4/. Compared to both the EU average and neighbors in the region, Montenegro's level of motorization is moderate (Fig. 1).



**Fig. 1** Number of passenger cars per 1000 inhabitants in 2010

## 2. Road safety indicators

Number of road accidents, deaths and injuries in OECD countries is decreasing, despite larger number of vehicles. Number of accidents reduced by 15% in period 1990-2010, fatalities by 25%, while number of injuries remained the same. In EU-27 states in 2010 the number of fatalities was down to almost half of the figure from 2001, /5/. According to CARE – EU road accidents database, the largest reduction of number of fatalities achieved Malta, 48%, Cyprus, 28% Denmark 18% and Portugal, 16%.

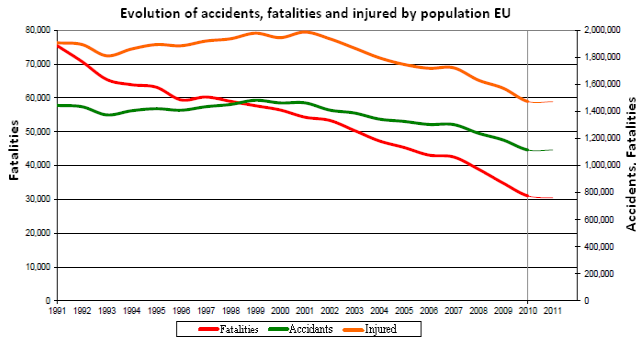


Fig. 2 Accidents indicators in EU

Countries of West Balkans as developing countries are trying to comply with the rules and regulations of the EU, including those in the field of transport. Despite that, all indicators of road safety in Montenegro have been increased over the previous ten years. Compared to 2000, in 2010 the number of road accidents went up 63.2%, fatalities by 17.3% and number of injured by 8.5%.

Over the last decade more than 1,000 people died on Montenegrin roads and more than 23,300 were injured. Mortality rate was the highest in period 2007-2009, over 10,000 accidents in 2008 and 122 killed in 2007 (see Table 3 and Fig. 3), /4/. However, in 2011 and 2012 Montenegro reduced number of road accidents and fatalities. The percentage of fatalities that occurred in crashes in 2012 was reduced by 52% compared with 2010 and by 62% compared with 2007. In spite of encouraging dates in last few years, studies show that number of fatalities in first six month of 2013 is already as high as in 2012.

Comparison of road safety performance depends somewhat on what indicator is used as a measure of exposure to risk; population, number of registered vehicles or distance travelled by motorized vehicles.

*Fatalities per 100,000 head of population.* This rate expresses the mortality rate, or an overall risk of being killed in traffic, for the average citizen. This is a particularly useful indicator to compare risk in countries with the same level of motorization.

*Fatalities per 10000 registered vehicles.* This is more objective indicator of situation on the roads. However, it's useful only when comparing the safety performance between countries with similar traffic and car-use characteristics.

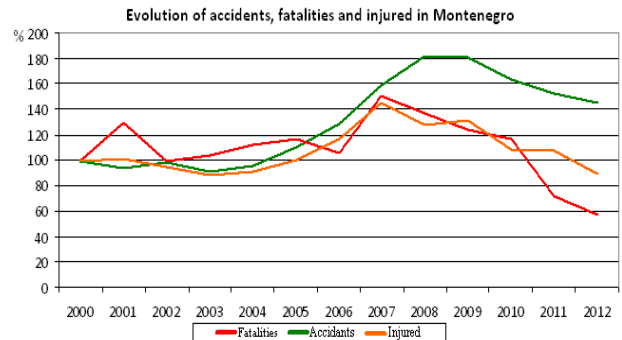


Fig. 3 Accidents indicators in Montenegro (2000=100)

According to OECD 2012 statistics, /6/, the rate in terms of fatalities per 100,000 populations in Montenegro in 2010 was 29.6. Comparing to both EU countries and neighbours in region, the risk of dying as a result of a road traffic injury on Montenegro roads is significantly higher.

Figure 4 shows the evolution of mortality expressed in terms of deaths per 100,000 population in European countries in 2011, /7/, and in EU-27, Montenegro and its neighboring countries in 2010 (\*), /6, 8/.

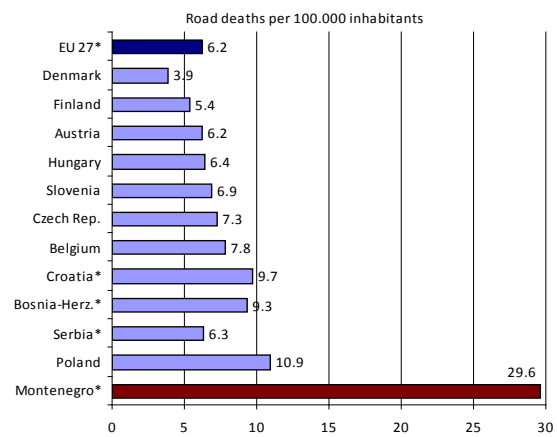


Fig. 4 Fatalities per 100,000 head of population (2010/2011)

Table 3 Traffic accidents and casualties on Montenegrin roads

Year	Accidents		Killed		Injured	
	Total	2000=100	Total	2000=100	Total	2000=100
2000	5597	100	81	100	1933	100
2001	5275	94.2	105	129.6	1957	101.2
2002	5503	98.3	81	100	1834	94.8
2003	5094	91.0	84	103.7	1702	88.0
2004	5377	96.0	91	112.3	1750	90.5
2005	6192	110.6	95	117.3	1942	100.4
2006	7185	128.4	85	104.9	2257	116.7
2007	8882	158.7	122	150.6	2796	144.6
2008	10170	181.7	111	137.0	2473	127.9
2009	10112	180.7	100	123.4	2542	131.5
2010	9138	163.2	95	117.3	2099	108.5
2011	8519	152.2	58	71.6	2075	107.3
2012	8103	144.7	46	56.8	1722	89.1

Number of fatalities per 10,000 registered vehicles is also higher comparing to other countries. However, there is a matter of vehicles from foreign countries in accidents on Montenegro's roads during the tourist season which are not included in the number of 10,000. Considering that fact, this rate (in terms of fatalities per 10,000 registered vehicles) is at same high as neighbor countries (Fig. 5).

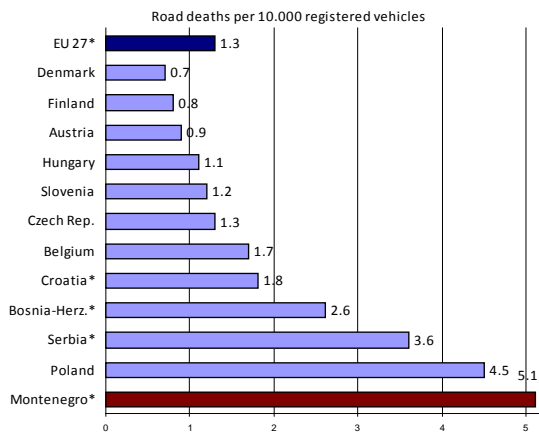


Fig. 5 Fatalities per 10,000 registered vehicles

All indicators show very poor road safety on domestic roads. Years 2007 and 2008 were particularly evil, which was the "price" of uncontrolled growth of motorization (in precedent years) and inadequate road infrastructure that couldn't "bare" an increasing traffic volume. The highest density of fatalities is found on main north-south route Border with Serbia – Bijelo Polje – Podgorica – Cetinje – Budva and Podgorica city zone.

According to WHO 2013 (World Health Organization), over one third of all road deaths in Montenegro is among drivers (34%), /1/. High mortality rate have both occupants and pedestrians, over 20% for each group (see Fig. 6).

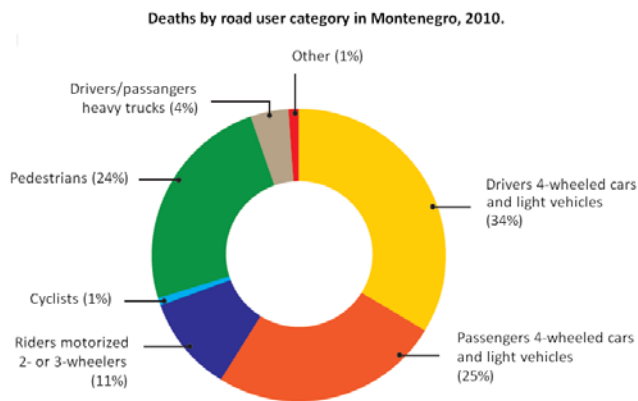


Fig. 6 Fatalities per 10,000 registered vehicles

### 3. Contrameasures

In May 2011, the United Nations launched a Decade of Action for Road Safety. The goal of the Decade (2011–2020) is to stabilize and reduce the increasing trend in road traffic fatalities, saving an estimated 5 million lives over the period. This report builds on the 2009 report, and provides additional data in a number of important areas. It is supported by a Global Plan for Road Safety. As a response, several countries released or updated in 2011 their national road safety strategies, /5/.

Although EU statistics clearly shows the progress that has been made over the last 10 years, road traffic safety performance in Montenegro is very poor.

Having traffic safety figures so bad, efforts have been made in recent years to address this issue. In 2010 National Coordination Board was established in Montenegro to monitor road safety parameters. In addition, government adopted Strategy for improvement of road traffic safety. Main goal of this strategy is to reduce number of fatalities by 30% and injuries by 20% before 2014 (compared to 2007). Long-term goal is to reduce these figures by 50% and 30% respectively by 2019, compared to the same year. Sadly, the growing interest in reducing road traffic risk is not accompanied with active road safety policies. Proposed measures are inadequate and insufficient – partly because addressing the situation properly requires considerable investments.

### 4. Conclusion

Over the last decade nearly all EU countries record a decrease in number of traffic casualties year after year. However, in the same period Montenegro's figures generally point in opposite direction – until 2007 – 2008 trend is towards an incline (with small exceptions) and declines only in last 2 – 3 years.

Dynamic growth of motorisation over the last 5-6 years took the government by surprise. With the road infrastructure unsuitable for the growing needs, a largely differentiated fleet of cars, difficulties with effective traffic enforcement and too few effective preventative schemes, the effects of growing motorisation have turned into a painful experience. In 2011 and 2012 Montenegro reduced number of road accidents and fatalities. The percentage of fatalities that occurred in crashes in 2012 was reduced by 52% compared with 2010 and by 62% compared with 2007. Major mortality rate is among drivers – about 34% of all road deaths.

Even though some improvements were made (government adopted Strategy for improvement of road traffic safety), the overall risk indicators in Montenegro remain above the EU average, not showing a decrease in their trend and a lot of work is yet to be done.

### 5. References

- /1/ World Health Organization (WHO) – Global status report on road safety, 2013
- /2/ MONSTAT, Traffic in Montenegro 2005–2010, Podgorica, 2011
- /3/ COWIS A/S, World Bank – Road Safety Survey Montenegro, Final Report, 2008
- /4/ Pajkovic, V., Grdinic, M., Causes and effects of road traffic accidents in Montenegro (in Serbian), Zlatibor, Serbia, 2014
- /5/ European Commission, Directorate General for Mobility and Transport – Road safety evolution in EU, 2012
- /6/ Trends in the Transport Sector 1970–2010, ITF/OECD, 2012
- /7/ IRTAD Road Safety Annual Report 2012, ITF/OECD, 2013
- /8/ European Commission – EU Transport in figures, Statistical pocketbook, 2012
- /9/ Pajkovic, V., Grdinic M., An analysis of young driver accidents in road traffic using in-depth crash investigation data, DEMI 2013, Banja Luka, 2013