

Adopting Recommendations of a Road Safety Management Capacity Review: addressing a tragic decade of road safety in Romania

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Key Findings

- Romania's road fatality rate per capita is the worst in the EU and third worst compared to 35 OECD countries.
- Ineffective leadership and lack of commitment to strong actions to reduce Romania's road fatalities were observed at various levels of government in the first half of the Decade of Action for Road Safety.
- Main causal factors are inadequate financial commitment, poor road safety education and knowledge among practitioners, high speed limits, weak speed enforcement and unforgiving road infrastructure, combined with risky/aggressive driving behavior.
- From 2016-2020 valuable actions were undertaken, adopting key recommendations of the road safety management capacity review undertaken in 2015/16.
- Well financed structured programs implementing Safe System road infrastructure, a centralised road safety regulator, lower speed limits, and stronger speed enforcement will be needed to further reduce fatalities.

Abstract

This article outlines a capacity review of Romania's national road infrastructure and road safety in general. Romania's road fatality rate per 100,000 population has improved overall from a 2008 high of around 15 to the current 2019 value of 9.6. However, the rate has flat-lined with no real improvement for the last decade, stalling at around 9.7 over the period 2011-2019 and around double the EU rate. Moreover, Romania's total annual number of road deaths has remained at an average of around 1900 fatalities per annum over this period. Romania has been the worst performing country in the European Union (EU) in recent years, and one of the worst performing countries compared to Organisation for Economic Co-operation and Development (OECD) nations in terms of road safety. The review performed in 2016 found inadequate political leadership and commitment to effective actions to reduce road fatalities, fragmented government road safety activities across a number of regulatory entities, speed limits set at levels that exceed internationally accepted survivable limits, weak traffic law enforcement including a lack of speed enforcement cameras resulting in a failure of drivers to comply with speed limits, and a lack of structured programs to implement human error tolerant road infrastructure constructed according to Safe System principles. A series of recommendations from the capacity review were adopted (as described here) since 2016, although much remains to improve road safety in Romania.

Keywords

Romania, Road Safety Review, Safer Road Infrastructure, Safer Speeds, Enforcement, LMIC

Glossary

European Union (EU) - As of 1st January 2020, the European Union is a political and economic union of 27 member states that are located primarily in Europe. Prior to 2020 the UK was a member (28 countries). Romania joined the EU as of 1st January 2007.

General Transport Master Plan (GTMP) - Romania's Ministry of Transport's key strategy documents for road

transport ratified in September 2016.

Global Road Safety Facility (GRSF) - A global multi-donor fund hosted by the World Bank. Its mission is to help governments develop road safety management capacity and scale up road safety delivery in low- and middle-income countries (LMICs).

National Company for Roads Infrastructure Administration CNAIR (in Romania, formerly the National Company for National Roads and Motorways-CNADNR)

Lower Middle-Income Country (LMIC) - Definition of a country's economic status based on a per capita gross national income: Low-income economies are \$1,025 or less; lower middle-income economies are between \$1,026 and \$3,995; upper middle-income economies are between \$3,996 and \$12,375; high-income economies are \$12,376 or more.

Organisation for Economic Co-operation and Development (OECD) - A group of 35 member democratic countries that support free-market economies and develop economic and social policy.

Romania (RO) - Acronym used in charts and graphs by EU for identifying Romania.

Romanian Road Authority (ARR) - Romanian government authority responsible for driver and instructor training, licences and road safety.

Road Safety Impact Assessments (RSIA)

Road Safety Inspections (RSI)

Supplementary Road Safety Inspections (SRSI)

World Bank (WB) - International financial institution that provides loans and grants to the governments of poorer countries for the purpose of pursuing capital projects.

Introduction

The European Parliament and Council adopted on the 19th of November 2008 Directive 2008/98/EC regarding road safety management, thus emphasising the increasing importance of road safety in the EU jurisdiction (European Union, 2008). The European Commission (EC) also adopted a target of reducing the number of road deaths on Europe's roads by half over the following 10 years (E C, 2010). The United Nations also, through the resolution adopted on the 2nd of March 2010, recognised the gravity of the road safety problem by declaring the decade 2011-2020 as the "Decade of action in road safety".

The EU Directive 2008/96/EC on Road Infrastructure Safety came into law in Romania in 2008 as set out in Law 265/2008 (Government of Romania, 2008). By inference, Romania was also required to halve their road fatalities. However, this target requirement was not recognised by the Romanian government until it amended the 2008 law via an Emergency Ordinance 22 tabled in June 16th, 2016 (Government of Romania, 2016A). Nonetheless, the amendments were mostly focused on road safety audits and inspections and freeing up Romania's capacity regarding certification of road safety auditors and inspectors. The amendment only spoke about possible fatality reductions of up to 60% via road safety audits. No actual target was set in that amendment of the Law. Similarly, no target was set in Romania's national General Transport Master Plan (GTMP) for transport that was initially proposed in 2006 which was then revised and ratified in September 2016 despite this plan being one of Romania's Ministry of Transport's key strategy documents for road transport.

However, the 'National Road Safety Strategy and Action Plan for the Period 2016 – 2020', an important document that is the first of its kind focusing on road safety, adopted by the Government of Romania via Decision 755/2016, states "*The overall goal of this strategy consists in halving the number of deaths from traffic accidents until 2020, compared to 2010, so that in 2020 there should be recorded no more than 1,188 deaths, compared to 2,377, in 2010.*" (Government of Romania, 2016B). Hence, the ambitious target to reduce the number of Romania's road fatalities by half was officially set, in line with the EU Directive and the Decade of Action in Road Safety goal.

It is worth noting that there was a surge in economic activity and subsequent rise in private motorised vehicle ownership in the period 2000-2011, particularly so after Romania joined the EU in 2007. Figure 1 shows the fatality rate per head of population started to rise in 2003 to a peak in 2008. Countermeasures such as stronger law enforcement, improvements to road infrastructure, training of drivers and presumably enhanced legal interventions in terms of culpable driving resulting in court prosecutions, helped reduce fatalities over a period from 2008-2014 (Figure 2). However, whilst Romania's road fatality rate per 100,000 population improved overall from a 2008 high of around 15 to the current 2019 value of 9.6, the rate started to flat-line with no real improvement for the last decade, stalling at an average of 9.7 over the period 2011-2019 as is obvious in Figure 1. Romania's population is almost 20 million for an area similar to the state of Victoria in Australia.

Alarmingly Romania's fatality rate per 100,000 population is almost double the EU rate (5.1 in 2019) and OECD rate (5 in 2017), and more than triple compared to EU road safety best performing countries (rate between 2 and 3 in 2019 for Norway, Sweden, Ireland, UK, Switzerland) (ETSC, 2020, BITRE, 2019). Moreover, Romania's total annual number of road deaths has remained at an average of around 1900 fatalities per annum over this period with a total number of just over 20,000 road fatalities in the past decade as indicated in Figure 2. This has resulted in Romania becoming the worst performing country in the EU (Figure 3) and one of the worst performing in the OECD nations in terms of road safety.

Romania's National Company for Roads Infrastructure Administration, CNAIR (formerly the National Company for National Roads and Motorways (CNADNR), who are responsible for road safety on Romania's national road network and motorways, which constitute around 26% of all of Romania's roads, were particularly concerned about the lives lost under their watch. CNAIR approached the World Bank (WB) office in Bucharest to assist with carrying out a road safety capacity review with a focus on assessing the safety of road infrastructure and how to improve it. Fatality data provided by CNAIR for analysis to the WB road safety expert team tasked with providing technical assistance is summarised in Table 1. The data revealed that around 54% of all road deaths occurred on roads administered by CNAIR and a large proportion of these were pedestrian involved fatalities. An analysis by Romania's Ministry of Interior (Police) for the year 2014 also shows that around 37% of

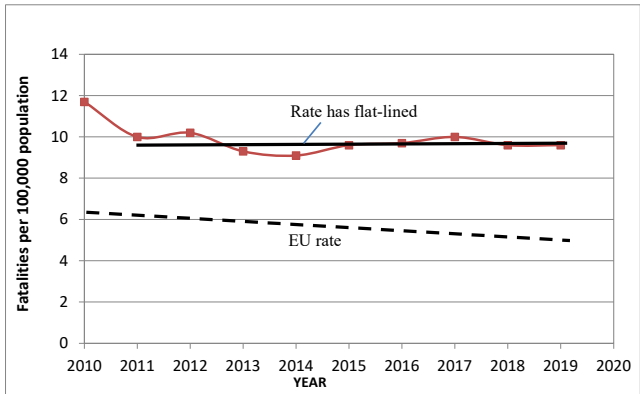
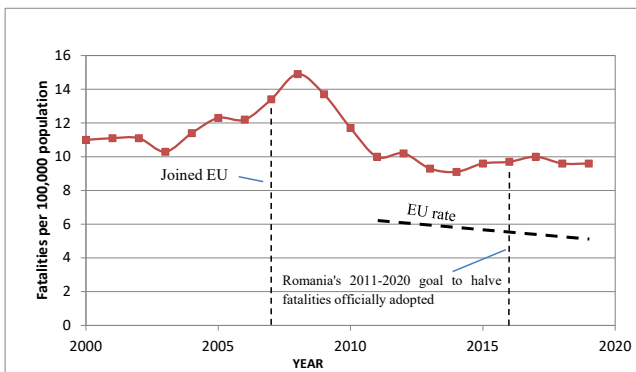


Figure 1. Romania’s road fatality rate per annum (source: European Commission)

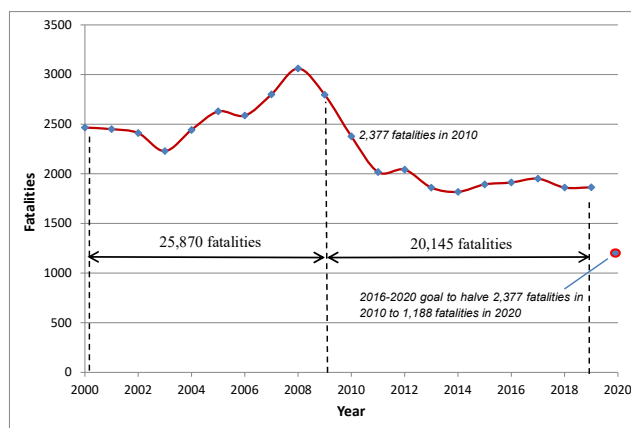
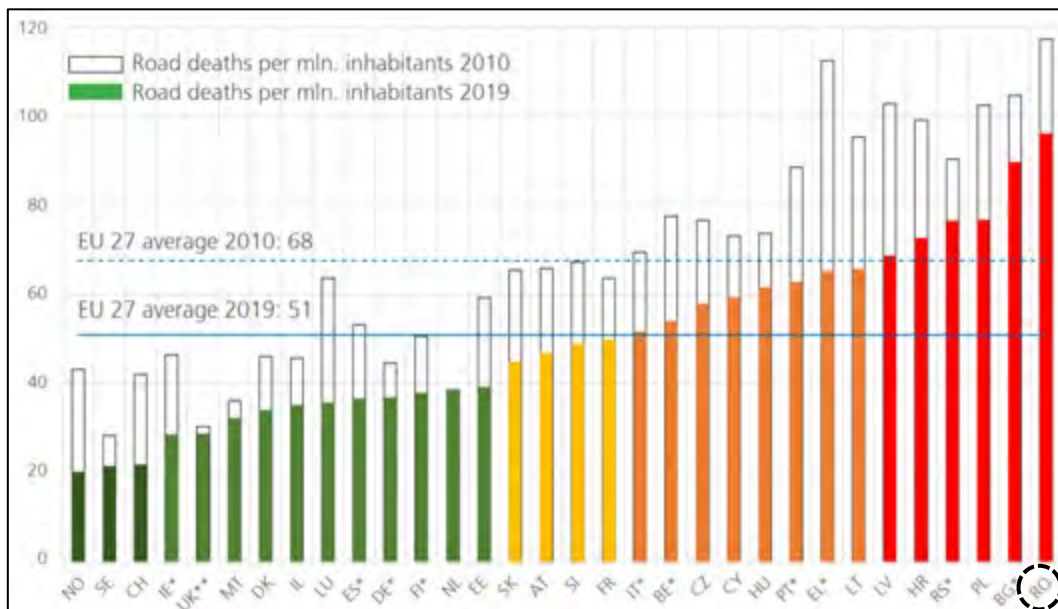


Figure 2. Romania’s total road fatalities per annum (source: European Commission)



Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Czech Republic (CZ), Cyprus (CY), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (EL), Hungary (HU), Ireland (IE), Israel (IL), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Serbia (RS), Slovakia (SK), Slovenia (SI), Spain (ES), Sweden (SE), Switzerland (CH), U.K. (GB)

Figure 3. Romania’s (circled) road fatality rate (source: ETSC, June 2020)

Table 1. Romania's road fatalities on according to road type 2011-2016 (Source: GRSF, 2017)

Crash year	Other Roads	Motorway	Communal Roads	County Roads	National Roads	Streets	Total
2011	30	16	74	381	1,076	441	2,018
2012	29	17	109	363	1,098	426	2,042
2013	27	24	89	322	1,020	379	1,861
2014	40	21	78	364	949	366	1,818
2015	22	19	113	346	1,017	375	1,892
2016	33	26	97	351	1,000	406	1,913
Total	181	123	560	2,127	6,160	23,93	11,544
Percentage	2%	1%	5%	18%	53%	21%	100%

fatalities are pedestrian involved crashes compared to motor vehicle occupant fatalities (drivers and passengers) and other crash type fatalities (e.g. motorcyclists, cyclists, etc.). Pedestrian fatalities are often considered the 'canary in the coal mine' indicator that speed may be a major causal issue on these roads.

This article presents some of the results from the road safety capacity review and assessment of the safety of road infrastructure on the roads administered by CNAIR (GRSF, 2017), but also the progress following the recommendations provided to CNAIR.

Method

Various technical assistance tasks were conducted by an expert team as part of a broad Road Safety Management Capacity Review based on World Bank review guidelines (Bliss, Breen, Job & Rouse, in press). Of these, two main tasks presented in this paper focused on reviewing why Romania's fatalities were high and why the fatality rate reduction was stalled. These tasks were (i) an assessment of the working relationships between road safety stakeholders within Romania's institutional framework, and (ii) access and analysis of the crash data and identification of the major crash causal factors and crash mechanisms. Analysis of the key road infrastructure problems and challenges that are contributing to fatal road crashes was also carried out. However, for brevity, that analysis will be reported in a later paper. Only a couple of examples relevant to speed will be presented here.

The analysis results presented are based on site visits, desktop research as well as information provided by interviews and structured discussions with CNAIR, the Romanian Road Authority (ARR), and the Road Traffic Directorate of the Romanian Police. ARR is responsible for driver and instructor training, licence register as well as road safety legislation and management of safety assessments such as Road Safety Audits (RSA), Road Safety Impact Assessments (RSIA), Road Safety Inspections (RSI) and Supplementary Road Safety Inspections (SRSI). The Police are responsible for approving infrastructure projects within a safety commission, recording traffic crashes and maintaining

the national crash database. These entities were identified by the team as the key road safety stakeholders at the national level, although other government entities were deemed as making a contribution and were required to provide assistance, such as Ministry of Finance for budgeting, Ministry of Education for establishing road safety curricula in schools, Ministry of Development overseeing county roads, and others (Figure 4). Even though CNAIR is the key player in road safety management of national roads and motorways, ARR and the Road Traffic police are also involved and oversee road safety of the entire Romanian road network, beyond national roads and motorways.

Structured interviewees (broadly based on Bliss et al., in press) provided a considerable degree of freedom to express their opinion and expertise. Questions also covered the operational procedure and management processes that interviewees may have been involved in or considered.

De-identified crash data was provided to the WB team by the Road Traffic Directorate of the Romanian Police. The data provided included the number of fatalities, date and time, location, whether the crash was urban or non-urban, road characteristic (straight or curved), existence of signs, street lighting, lane separation, shoulder characteristics, road barriers and their type, overtaking restrictions; conditions and type of road surface (wet or dry), lighting (cloudy, dawn, daylight), weather (dry, rain, snow); main cause of crash (speeding, fatigue, struck pedestrian, etc.), crash mechanisms (rollover, side impact, struck object, etc.). No case files or crash details such as vehicles types were available.

Whilst data analysis was carried out by the WB team, crash causation was determined by the Police. Crash data are collected by the Traffic Police and specific case files and detailed forensic data can only be analysed by them. Interpretation of the crash causation is carried out by the Police and then a summary of the data is provided in a spreadsheet to other institutions.

Data were analysed to identify crash clusters where there was a high casualty count, essentially blackspots. Nine mid-block road crashes and three intersection crashes were

POLITICAL LEVEL		TECHNICAL LEVEL								
1	2	3	4	6	7	8	9			
ROAD SAFETY NATIONAL CONFERENCE (annual) - Information of Parliament	CISR- (every 6 month) - Prime Minister or Minister of Transport	1 Ministry of Transport	Road Transport Department	ARR (License drivers schools , Driving instructors training, road safety audit)	DPISR.- (monthly) -Secretary of State	Workgroups (unspecified) - elected president + secretary from SCISR	a	Collection and analysis and public information		
			RAR (vehicles control)				b	Infrastructure and road signs		
			SCISR - secretariat				c	For traffic education		
			ISCTR (driving schools control and road transport control)				d	For monitoring road traffic		
		2 Ministry of Interior	Infrastructure Directorate	CNADNR (roads and highways road infrastructure)				e	Urban Development Environment and Health	
			Traffic Police	Traffic law enforcement				f	For intervention in case of accident	
		3 Ministry of Finance		Directorate for driving licences and vehicles registration			Examination for driving licenses and vehicle registrations		g	For road vehicles
		4 Ministry of Development		Budgetary provision			Budgetary provision		h	Road Transport, training drivers and road safety communication
		5 Ministry of Education	Traffic Education	County and country roads infrastructure			County and country roads infrastructure			
		6 Ministry of Health	Directorate for emergencies	Curriculum for traffic education in schools and universities			Curriculum for traffic education in schools and universities			
7 Ministry of Communication		Intervention in case of accident	Intervention in case of accident							
8 Ministry of the Environment		Single emergency number 112	Single emergency number 112							
9 The local administration Bucharest		Environmental impact assessment for infrastructure works, noxious.	Environmental impact assessment for infrastructure works, noxious.							
Other local administration		Urban road infrastructure and public transport	Urban road infrastructure and public transport							
		Urban road infrastructure and local public transport at county level	Urban road infrastructure and local public transport at county level							
		* held workshops	* held workshops							

Figure 4. Institutional Framework: Government Ministerial Departments and Institutions and their interrelationship related to road safety and road transport

found using the 2011-2016 crash database provided by the Romanian Traffic Police. Another seven crash cluster locations were also identified from a 2007-2012 black spot analysis carried out by consultants who assisted the Romanian government draft the original GTMP. These were further assessed by the WB team but for the years 2011-2016 to see if the number of casualties had increased or decreased. All of these sites were deemed as black spot sites. All but one of the sites was visited by a member of the WB team and drive through in both directions was recorded using a Go-Pro camera mounted in the vehicle. Google Earth and Google Map Street view was then used to carry out a desktop review of these sites and recommended injury reduction countermeasures were provided. However, as mentioned earlier, the analysis is not the object of this paper and will be reported at a later date.

Conclusions were then drawn from all of these analyses and a series of recommendations were provided to CNAIR. Only brief aspects of the institutional framework review and crash data analysis work are presented below, together with a few examples on how WB recommendations were put into action.

Results and Discussion

Institutional Framework

Figure 4 above shows the current diverse range of Romanian government institutions that address the broad aspects of road safety related activities, namely: the Inter-Ministerial Council for Road Safety (CISR), the Permanent

Inter-Ministerial Delegation for Road Safety (DPISR), a Road Safety Directorate within National Company for Roads Infrastructure Administration CNAIR (formerly CNADNR), the Romanian Road Authority (ARR), the Romanian Automotive Register (RAR), the Road Directorate of the Romanian Police (DR), the Directorate for Driving Licensing and Licence Plates (DRPCIV), and the State Inspectorate for Road Transport Control (ISCTR).

The CISR is a governmental consultative body addressing road safety policy aspects at the national level providing an institutional framework for legislation and organisation of road safety. This Council was established in 1995, however, it only became active after 2008 when its activities were formalised and legislated (Government of Romania, 2008). The members of this CISR are divided into three groups: Ministerial level, local authority level and other associations. The first group is represented by the following Ministries: the Ministry of Transport (i), Ministry of Internal Affairs (ii), Ministry of Public Finance (iii), Ministry of Rural Development (iv), Public Administration and European Funds (v), Ministry of Environment (vi), Ministry of Communication and Informational Society (vii), Ministry of Education (viii). The second group consists of the following local authorities: Bucharest local administration (i), Romanian Federation of Local authorities (ii), Romanian association of Cities (iii), Romanian Association of Villages (iv), National Union of Romanian County Councils. The third group is represented by the following associations: Non-Governmental Organisations (i), academia (ii), research institutes (iii), and private companies that are (partially) involved in road safety. The President of CISR is the

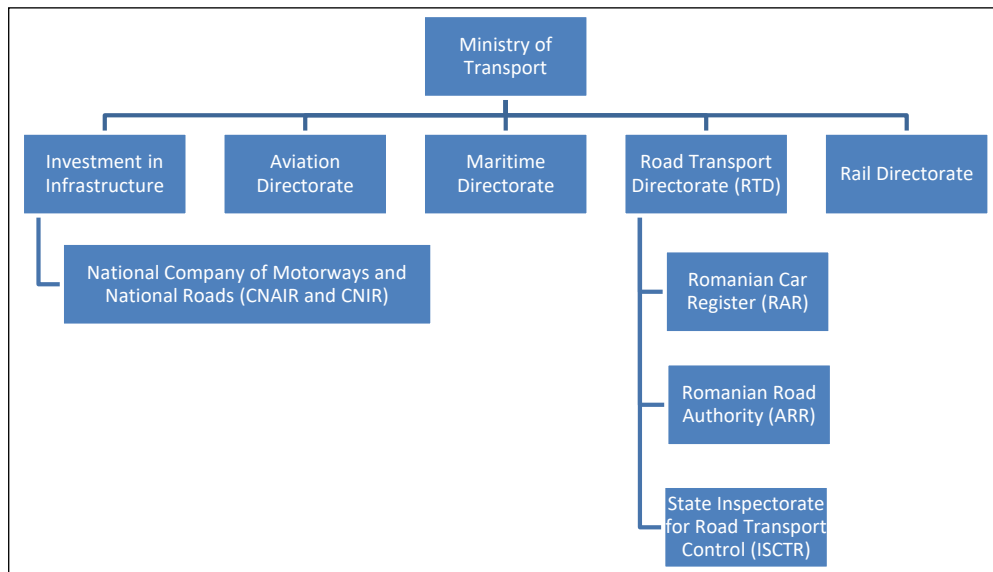


Figure 5. Diagram of government entities/ directorates within the Ministry of Transport

Prime-Minister of Romania, and the Council is chaired by the Minister of Transport. Figure 5 below shows a diagram of government entities/ directorates within the Ministry of Transport.

The DPISR is a working group of road safety experts within CISR. This group was set up to ensure the continuation and implementation of the National Road Safety Strategy (NRSS) (Government of Romania, 2016B). Together with CISR, DPISR is responsible for shaping the priorities of the national action programmes regarding road safety and for raising awareness regarding road safety in Romania in general.

The CISR, as a lead national agency, does in principle exist with the aim and responsibility to direct the national road safety effort. Moreover, the lead agency's role is defined in legislation. The members of the CISR and the associated DPISR generally appeared to be the right organizations to lead road safety and most of the involved institutions (CNAIR, ARR, and Traffic Police) appear active and motivated at a professional level. However, at a political level, CISR's responsibility and interest appeared unclear. The review found that:

- At the Ministerial political level regular meetings were supposed to occur. However, these were not taking place when the WB team were carrying out the capacity review.
- DPISR did not hold any meetings from around 2012 to 2014 and then from July 2015, monthly meeting activities were relaunched. It appeared some road safety countermeasure activities were agreed to and minutes prepared but no follow up as to whether the proposed road safety countermeasure activities had been carried out.
- No dedicated funding and budget for the CISR and the associated DPISR was allocated. Each institution (CNAIR, ARR and Police) had to find resources from

its own budget, which was a considerable disincentive. No active finance experts or people from treasury attended CISR even though significant sums of money were collected from traffic infringements.

- Some politicians feared a backlash from voters regarding any road safety measures they would recommend, such as increasing for example enforcement, introducing speed cameras (covert, fixed point and point-to-point) and reducing speed limits.
- Interventions seem to be coordinated horizontally across most main key stakeholders but vertically only to some extent between national, county and city agencies.

What was clear from the interviews and the institutional framework review was that the road safety efforts appeared to be decentralised with a number of disjointed government road safety activities across a number of regulatory entities. For example, CNAIR was responsible for road safety on national roads and motorways whereas ARR were responsible for road safety legislation for all Romanian road network. Moreover, CNAIR had to rely on ARR for road safety audits, who were the only institutional body who could carry out road safety audits, causing an inherent bureaucratic and financial impediment for improving the safety of national roads and motorways. Up until the Emergency Ordinance 22 was passed in June 16th, 2016 (Government of Romania, 2016A), there was a very limited number of certified road safety auditors and inspectors. Under the initial provisions of Law 265/2008, it was not possible to train new road safety auditors due to this regulation being too restrictive regarding newly certified auditors being used for any new projects. Also, the fees established by the norms of the Law 265/2008 (Minister of Transport and Infrastructure Order no. 480/2011) were extremely high compared to other good practice countries, e.g. the cost for a road safety audit reached 50,000 euro per km. This in turn led to a deficiency in road safety audit operations, which in turn prevented the construction and

modernisation of road infrastructure. This also led to the forfeiting of any available European funds that could be allocated for such projects. The scope of the law exceeded the provisions as set out in the respective EU Directive.

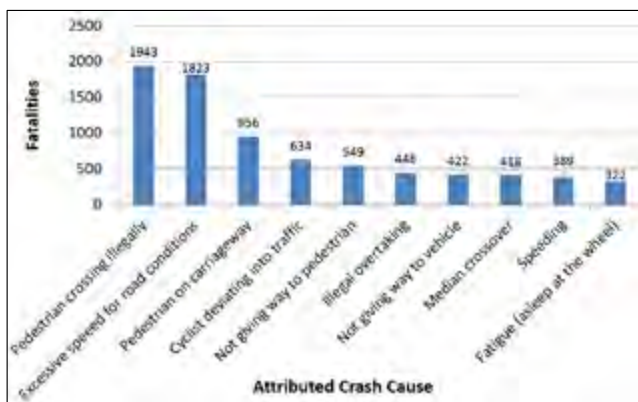
These early institutional arrangements and obvious lack of political interest to introduce known evidence-based injury prevention countermeasures, such as increased speed and other enforcement, all pointed to being one of the main causal factors for such a poor road safety performance in Romania.

The National Road Safety Strategy and Action Plan 2016-2020 was officially adopted in 2016 by the Government through Decision 755/2016, and together with Emergency Ordinance 22, Law 265/2008 was updated thus allowing various agencies like CNAIR, ARR and Traffic Police to enhance their inter-institutional coordination and to develop stronger road safety activities essentially from 2017 to now and of course into the future.

Crash Data Analysis

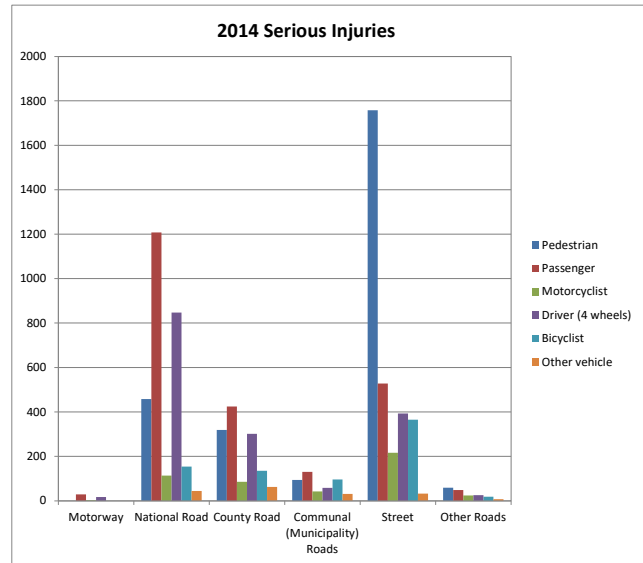
The de-identified data provided to the WB team was analysed to determine the scale of the problem as well as the underlying causal factors. Figure 6 shows that the majority of fatalities were attributed by Police to ‘inappropriate’ behaviour of pedestrians and excessive speed for the road conditions. Further analysis of 2014 data carried out and shown in Figure 7 identifies that the majority of fatalities are occurring on national roads that come under CNAIR’s purview. Figure 8 presents the time of day when the pedestrian fatality occurred. Dusk and evening fatalities (5 to 9 pm) are approximately double daytime fatalities. The three graphs (Figure 6 to Figure 8) inferred that speed, including inappropriate speed limits and enforcement, pedestrian visibility and road infrastructure on national roads were major issues that required addressing in terms any road safety strategies and policies.

There was concern by the WB team that the data were not being analysed with sufficient detail and clarity by



Note: Only 7902 (69%) of data shown here. Other causal factors such as alcohol, distraction, etc. with lower numbers attributed by Police are not presented

Figure 6. Road fatalities in Romania (2011-2016) (n=11,544 analysed)



Road Lengths - Motorways 635 km, National Roads 15629 km, County Roads 36010 km, Municipal Roads + Streets 27789 km

Figure 7. 2014 Fatalities segregated by crash type and road type (n=1,818 fatalities)

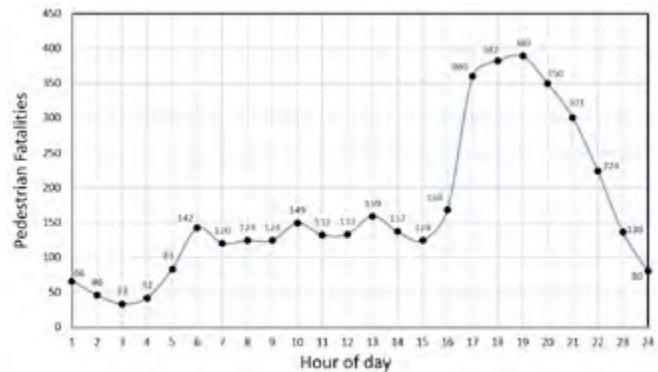


Figure 8. Pedestrian fatalities according to time of day (2011-2016) (n=4,084)

the Police investigators to establish the true nature of the crash in terms of ‘system’ failure. Usually, when Police alone investigate a casualty crash there is a natural desire to attribute blame to a particular road user involved in the crash. It was felt that this may be impeding progress in terms of reducing road fatalities. Blaming the victim has a long history, and continues to provide considerable hindrance to advancing injury prevention activities and helps to obfuscate the actual causes of death and injury. A crash resulting in injury may represent a possible failure or inadequacy in some component of the vehicle-road system to protect road users from severe injury. Crashes provide feedback on system performance and should be viewed and analysed with a neutral perspective (Rechnitzer and Grzebieta, 1999, Grzebieta and Rechnitzer, 2001).

The team that analyses the data should be a mix of ‘neutral’ professionals who cover off statistical and human factors expertise, epidemiology, road crash investigations and reconstructions, road safety audit, road safety inspections,



Figure 9. National Road 1, on approach to a group of shops, restaurant and eating places and petrol station on the right. Speed limit set at 100 km/h.



Figure 10. Downtown Bucharest in one of the main shopping precincts where there are large numbers of pedestrian shopping at local department stores. The speed limit is set at 60 km/h, which is essentially not survivable if struck at this speed.

traffic and road engineering related to road safety and effective enforcement strategies that assist drivers and pedestrians from a safe system perspective. Moreover, this data should be accessible for other research institutes who can assist with identifying the link between causal factors and proposed countermeasures.

The WB team found in 2017 that crash data for a specific location is only requested by CNAIR and ARR on an ad-hoc basis in order to analyse a safety issue that may be associated with a particular segment of national road. The exchange of the crash data between the CNAIR, ARR and the Police was not yet regulated or harmonised when the capacity review was carried out. Discussions with CNAIR, ARR and the Police however identified that all three organisations consider it important that crash data is made readily available. In other words, ideally crash data should be publicly available and yearly updated so that CNAIR, ARR and road safety research organisations can carry out much needed analysis of the data, which in turn would benefit road safety in Romania.

Two illustrative examples where it was obvious the speed limit was grossly excessive and yet the road user was blamed if struck by a vehicle are shown in Figures 9 and 10. This was in contrast to the local road authority perceiving the high crash risk and the taking positive action to prevent further casualties.

In the first example, Figure 9 shows a four-lane road (National Road 1 - DN1) with a median concrete barrier separating two lanes where vehicles travel in opposite directions. The speed limit is set at 100 km/h. Vehicles in the right two lanes travel past a T intersection and then a series of eating places, restaurants, shops, a petrol station and a rest stop with lavatories, grouped over a length of around one kilometer. Vehicles were slowing down to a slow speed and turning into restaurants, shops, petrol station, car park etc. Vehicle occupants, including children, exit the car and wander around the car park while at the same time traffic can legally travel past the car park at 100 km/h. Vehicles were also reversing out of car parks by the side of the road at the restaurants (see frame 3).

There have been 6 fatalities and 7 serious injuries at this site. Four of the fatalities were pedestrians and two were car occupants. In four of the incidents involving pedestrians, Police attributed blame to the pedestrians as having illegally crossed the road. In regards to the vehicle occupants, it was stated that vehicle driver approaching the intersection along the stem of the T intersection did not give way to vehicles approaching at 100 km/h along the straight section.

According to the local engineer responsible for the safety of this road when questioned in a workshop, the series of commercial entities were all built without a government-building permit. Hence, the inconsistencies between the road environment and the speed limit.

To blame the pedestrian that they made an illegal crossing in a pedestrian active area where there are no signs or speed limits nor warnings that are appropriate for the conditions, is the antithesis of what the Safe System principles are all about, i.e. humans make errors so the system must be designed to compensate for those errors. Obviously, the speed is much too high, particularly when considering perception reaction times of a driver travelling at 100 km/h. Vehicles waiting at the stem of the T-intersection will have difficulty in perceiving vehicles approaching that are travelling at 100 km/h. Moreover, because of inadequate speed enforcement, vehicles were often observed to be travelling at 110 to 120 km/h. This would further exacerbate such a human inability to perceive a vehicle approaching at a high speed and being able to judge if it is possible to pull out in time with sufficient lead-time to accelerate to a safe speed and not be struck either in the side or rear.

Stating that a pedestrian crossed illegally or that a vehicle did not give way at this site, i.e. blaming the victims is unrealistic, if not negligent in such high-speed conditions where there are a lot of pedestrians in the area. It is also symptomatic of the possible inaccurate assessments of the causal factors that have been coded into the crash database. The Traffic Police should consider all contributory factors when a fatality happens, and if needed, reach out to the road authority, which should ultimately be held responsible for allowing this unacceptable situation to continue, i.e. where

human factor demands for both the vehicle driver and the victims are well beyond their human capabilities resulting in death and serious injury.

A second example demonstrating the excessive speed limit set by local authorities in a major downtown shopping area where the high-risk pedestrians are being exposed to, is shown in Figure 10. The speed limit is set at 60 km/h. However, again because of inadequate speed enforcement and lack of political interest to curb speeding drivers, vehicles were regularly observed to be travelling at 70 to 75 km/h during their green phasing at the intersection. Hussain et al (2019) showed that the risk of a fatality reaches 5% at

an estimated impact speed of 30 km/h, 10% at 37 km/h, 50% at 59 km/h, 75% at 69 km/h and 90% at 80 km/h.

Recent Progress

Romanian authorities CNAIR, ARR and Traffic Police have made considerable efforts to adopt key recommendations from the WB Road Safety Management Capacity Review report (GRSF, 2017), and to implement the policies outlined in the National Road Safety Strategy 2016-2020. The modification of Law 265/2008 in 2016 represented the basis for the activities presented below, despite a set back from the Romanian Parliament, who amended Emergency Ordinance



Figure 11. Romanian National Road 2 (DN2) pilot road upgrade program launched in 2019



Figure 12. Romanian National Road 7 (DN7) roller barrier pilot launched in October 2019

no. 22 and removing county roads and urban roads from the list of mandatory roads to undergo RSAs and RSIs (Government of Romania, 2017).

Nonetheless, an important process that was proposed in the updated law and is currently in use is the Supplementary Road Safety Inspection (SRSI), which is performed by ARR certified road safety auditors, upon notification from Traffic Police or to verify whether RSA recommendations were put in place. Also, failure of the road administrator/investor to request ARR to perform an RSA or RSIA on a new transport project is subject to a fine of 50,000 lei to 100,000 lei (~US\$11,600 – 23,200).

Notable progress over the past few years also includes the establishment of a national 3-week Road Safety Auditor training course based on best practice road safety knowledge, led by ARR in partnership with Technical University of Civil Engineering Bucharest (TUCEB). The first course started in November 2016, and it was under a train-the-trainer format with international experts from Germany and Serbia working together with experts from TUCEB to both prepare materials and also undertake RSAs and RSIs. Traffic Police, CNAIR, experts from other universities and from the private sector were invited to attend the course and to be involved in future training. 156 Road Safety Auditors have been accredited nation-wide so far since 2016. This has included four training courses delivered, as well three refresher courses for currently certified auditors. Feedback received from participants, most of whom are seasoned transport engineers, was that they perceive the road now differently, i.e. with a ‘road safety’ context, post course.

A Manual for Road Safety Auditors in Romania was also released in June 2019, which sets out best practice road safety engineering and is used as the main course material for the RSA courses. The main goal of this manual was “to change mindsets and show Romanian road safety professionals that safer road environments are possible, sometimes even with very low costs” (Burlacu F.A. et al,

2019). In addition, CNAIR and TUCEB recently signed in June 2020 a collaborative agreement on various themes such as research and scholarships for students related to road infrastructure that includes road safety.

Post the start of the 2016 RSA courses, RSIs have been carried out on 2,000km of national roads to mid-2020 together with 460 SRSI of fatal crash locations and 350 RSAs of different roads types. The main upgrades that CNAIR have been requested to carry out to enhance safety on these audited roads in 2019 were (based on October 2019 data) related to: traffic signs (40%); road markings (17%); crash barrier (22%); visibility issues (7%); damaged shoulders (5%); potholes (3%). In addition, in 2019 based on SRSIs that were carried out following 420 fatalities on national roads, 94 SRSI reports were prepared with the result that CNAIR must urgently put into place 328 mandatory road safety measures with a further 229 road safety upgrade recommendations when practicable.

With steadily improving collaboration between CNAIR, ARR and Traffic Police, and after considering recommendations provided from RSIs/SRSIs reports and from the 2017 WB capacity review report (GRSF, 2017), CNAIR launched several road safety pilot infrastructure upgrade programs on high risk sectors of their national roads. One of these pilot upgrades is on National Road 2 (also called European road 85 – E85). This road is one of three highest fatality risk roads in the country, and the only link between two important regions of the country, Muntenia and Moldova. The road width is 12.00 meters: 3.50 meters lane width in each direction and 2.50 meters shoulders/emergency lane. A pilot section of the road was upgraded into 2+1 alternative lanes, as shown in Figure 11, following positive fatality reduction experience from other neighboring countries who implemented such upgrades.

Another innovative road safety pilot program recently initiated by CNAIR in October 2019 was the installation of roller barriers on sections of National Road 7 (DN7) based on previous crash history, as shown in Figure 12. These

barriers are considered a “softer” (more forgiving) type of barrier. These novel barriers have already been hit with no apparent major damage, suggesting that they have already saved lives.

Conclusions

Despite recent progress through legislative improvements, better knowledge sharing and innovative road infrastructure pilot programs, Romania has yet to achieve the high reductions in the number of people killed on roads to which it committed in the past years. The life-saving value of the improvements made will only be taking effect from late 2019 and so is not visible in annual data as yet. Wider application of these programs is warranted. The main factors causing Romania to remain the worst performing EU country are, most importantly: inadequate political leadership and lack of high-level commitment to reduce road fatalities; decentralised disjointed government road safety activities across a number of regulatory entities; speed limits set at levels that exceed internationally accepted survivability crash limits for a road infrastructure system that is unforgiving to human error; weak enforcement of traffic laws including a lack of speed enforcement cameras resulting in a failure of drivers to comply with speed limits; and a lack of structured programs to implement human error tolerant road infrastructure constructed according to Safe System principles.

CNAIR, ARR and the Traffic Police should continue to collaborate closely with each other and also work with the Inter-Ministerial Council for Road Safety (CISR) along with other road safety stakeholders.

Improved access provided to detailed forensic crash investigation data to the road authorities from ARR was noticed as a good progress, but this should be expanded further on to CNAIR, as well as to university and research centers where researchers who comply with ethics approval requirements can research the data in detail similar to what occurs in most road safety best practice countries.

It is obvious that Romanian authorities need to urgently increase speed enforcement, review all speed limits on the national and local road network, and pay particular attention to pedestrian safety especially over the evening period. Setting speed limits to survivable levels and increasing speed enforcement through an extensive safety camera program, where fines accumulated from the enforcement are hypothecated specifically to road safety improvements, is the most-effective means by which fatalities and serious injuries can be reduced significantly at a rapid rate. One hopes that this will happen sooner rather than later to avoid another decade where 20,000 road users might die as a result of inaction.

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Disclaimer

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