# ROAD SAFETY MANAGEMENT IN LOCAL COMMUNITIES

Milenko Čabarkapa

Faculty of Transport, Communications and Logistics, Budva, Montenegro e-mail: milenko.cabarkapa@fskl.me, +382 67 240-609

# Zoran Ž. Avramović

Paneuropean University Apeiron, Banja Luka, Republika Srpska, BiH e-mail: zoran.z.avramovic@apeiron-uni.edu.eu, +387 65 224-604

DOI: 10.7251/JIT16027C

Case study UDC: 656.08:352.07

**Abstract:** The research of coordination of activities and responsibility-sharing at the appropriate level of road safety management, conducted by analyzing responses from the prepared Questionnaire, in the period before and after the adoption of the Global Plan for the Decade of action for road safety 2011-2020, showed that the improvement or deterioration of the state of road safety at all levels of management, particularly at the local level within Montenegro, can be directly associated with the achievement of coordination of activities and responsibility sharing for the state of road safety. The aim of the paper is to encourage the development of the road safety system in local communities, basing on a vertical coordination in national and local activities and horizontal coordination in activities at the local level, with the establishment of a responsibility sharing system for the state of road safety in local communities.

Keywords: activity, coordination, responsibility, road safety, level of territorial organisation, local community.

# INTRODUCTION

After recognising in 2004 that road safety is a global problem [24] the World Health Organisation declared in 2009 that it is time for activities for road safety [25]. In 2010 United Nations declared a Decade of action for road safety 2011-2020 [20]. The goal of the Decade is to stabilize and then reduce the forecast level of road traffic fatalities and thus save 5 million lives in the world by 2020. For the international coordination of national activities to achieve the goals of the Decade, a Global plan for the Decade of action for road safety is adopted [26]. By the Global Plan for the Decade of action for road safety 2011-2020, an overall framework is formed, in which are the five pillars for activities at national level: road safety management, safer roads and mobility, safer vehicles, safer road users and post-crash response [26].

Encourage the creation of multi-sectorial partnerships and designation of lead agencies with the capacity to develop and lead the delivery of national road safety strategies, plans and targets, underpinned by the data collection and evidential research to assess countermeasure design and monitor implementation and effectiveness, is the first pillar of national activities recommended by the Global plan for the Decade of action for road safety 2011-2020 [26], based on the recommendations of the World report on road traffic injury prevention, proposed by the Global Road Safety Commission (2009).

This can be achieved through:

- encouraging the establishment of coordination groups,
- building partnership coalitions, by involving different sectors (traffic, health, police, judi-

ciary, urban planning, etc.),

- creating partnerships with development banks, national governments, civil society, educators and private sector,
- promoting responsibility for road safety, by shifting a major share of the responsibility from the individual road users to those who design the road transport system: road authorities, architects, urban planners, the automotive industry, police, government and legislative bodies, health services, the judicial system, schools, and nongovernmental organizations,
- establishing the legal responsibility of authorities responsible for designing the road system and individual road users for non-compliance with laws and regulations.

In this paper, the road transport safety is analyzed as a product of management system based on coordination of activities and responsibility sharing. This paper analyzes the changes in the state of road safety in the period before (2007 and 2010) and the period after (2013 and 2014) the adoption of the Global Plan for the Decade of action for road safety [26], at global level within the world, regional level within WHO regions, national level within Montenegro, and local level within local communities of Montenegro. The improvement or deterioration of the state of road safety at all these levels can be directly associated with the achievement of coordination of activities and sharing of responsibilities for the state of road safety, as the Global Plan for the Decade of action for road safety [26] is adopted for the international coordination of national activities and promoting accountability for the achievement of the objectives of a Decade of action for road safety 2011-2020 [26], to stabilize and then reduce the forecast level of road traffic fatalities.

# **ROAD SAFETY MANAGEMENT**

The accepted approach is that road safety is produced [15, 10, 18, 13, 6]. To achieve this goal, a management system is required, in which the management function promotes interventions, which in turn produce results [1]. It is a management system based on the standards of road safety [8], with a focus on results, which product will be the continuous improvement of road safety. Institutional management function includes: coordination, regulations, financing and allocating resources, promotion, monitoring and evaluation, research, development and knowledge transfer [2].

Coordination refers to the orchestration and coordination of interventions and other related institutional management functions to achieve the desired focus on results.

In general, coordination of institutional management function of road safety is reflected in: [2]

- horizontal coordination,
- vertical coordination,
- partnership, and
- parliamentary relationship.

A characteristic of the road safety management is that it allows a universal use at all levels and in all countries, regardless of their size or developmental performances of road safety [19, 2].

To achieve an efficiency and effectiveness of road safety management, the coordination of activities must allow responsible decision making at higher institutional levels and responsibility for the improvement of road transport system at lower institutional levels, especially in the area of roads, vehicles, behaviour and health care [22, 7, 16, 5, 9, 17, 14, 23, 30].

# **R**ESEARCH METHOD

Changes in the state of road safety are analyzed in the period before and the period after the adoption of the Global Plan for the Decade of action for road safety [26], adopted for the international coordination of national activities and promoting accountability for the achievement of the objectives of a Decade of action for road safety 2011-2020.

Basic indicators of road safety, which were used in the analysis, are the number of fatalities and the public risk (deaths per 100,000 population).

Space research includes: at global level - the world, at regional level - WHO regions, at national level – Montenegro, and at local level – local communitiesmunicipalities in Montenegro. The research covered the period from 2007 to 2010, for the period prior to adoption, and from 2013 to 2014, for the period after the adoption of the Global Plan for the Decade of action for road safety.

The study is based on data published in the Global status report on road safety [25] and the data published by Monstat for Montenegro [11].

The research of coordination of activities at the appropriate level of road safety management is conducted by analysing responses from the Questionnaire (Table 1). on the world's roads is reduced from 1.3 million in 2007 to 1.25 million in 2013, while in 2010 it amounted to 1.24 million, which means that it has remained fairly constant from 2007 to 2013, despite an increase in global motorization and population. At the same time, the public risk is reduced from 18.8 to 17.5 died per 100,000 population (Figure 1). This indicates that interventions to improve global road safety prevented an increase in the overall death occurring, which would certainly occurred without the interventions. The goal of the Decade to, first, stabilize the number of road traffic fatalities in the world, is achieved in the first two years of implementation.

Table 1. Questionnaire. Research of coordination of activities at the appropriate level of road safety management

Questions	Yes	Partial	No
Are interventions being coordinated horizontally across competent bodies to achieve the desired focus on results?			
Are interventions being coordinated vertically between competent bodies to achieve the desired focus on results?			
Has coalition partnership been builtbetween competent bodies to achieve the desired focus on results?			
Have Parliamentary committees and procedures supporting the coordination process been established to achieve			
the desired focus on results?			
Has responsible decision making at higher institutional levels been established, and has legal responsibility of			
competent bodies to design road transport systems at lower institutional levels been established to achieve the			
desired focus on results?			

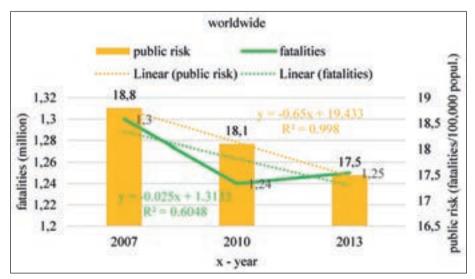


Figure 1. Changes in the number of fatalities and the public risk at the global level

# STATE OF ROAD SAFETY

# Global level - world

According to the Global status reports on road safety for 2007, 2010 and [25], the number of deaths

The research of coordination of activities at the global level of road safety management, conducted by analyzing responses from the Questionnaire (Table 2) shows that further improvements in road safety are possible and that they will be generated by 
 Table 2. Questionnaire. Research of coordination of activities at the global level of road safety management

Questions	Yes	Partial	No
Are interventions being coordinated horizontally across competent bodies to achieve the desired focus on results?	United Nations World Health Organisation World Bank Global Road Safety Partnership		
Are interventions being coordinated vertically between competent bodies to achieve the desired focus on results?	Second UN Global Road Safety Week, 6-13 May 2013 Third UN Global Road Safety Week, 4-10 May 2015 2nd Global High-Level Conference on Road Safety results in "Brasilia Declaration", 18-19 November 2015		
Has coalition partnership been built between competent bodies to achieve the desired focus on results?	UN Road Safety Collaboration Global Road Safety Partnership		
Have Parliamentary committees and procedures supporting the coordination process been established to achieve the desired focus on results?	On 10 April 2014 the UN General Assembly adopted a resolution on "Improving global road safety".		
Has responsible decision making at the global institutional levels been established to achieve the desired focus on results?	United Nations World Health Organisation World Bank Ministers and heads of delegations gathered at the Conference in Brasilia		

the road safety management, based on coordination of activities and responsibility sharing.

the level of road safety management system, based on coordination of activities and responsibility sharing.

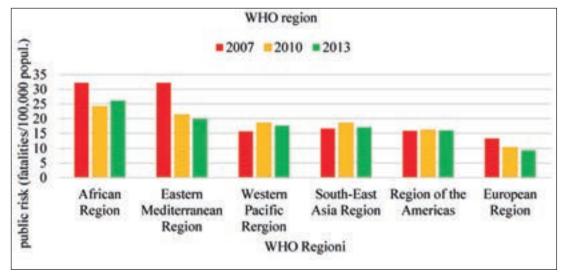
#### **Regional level - WHO regions**

The public risk in road transport varies considerably across WHO regions, with no change in the order, in the period before (2007, 2010) and the period after (2013) the adoption of the Global Plan.

However, in the African region, there has been a deterioration of road safety by increasing the rate of public risk from 24.1 in 2010 to 26.1 in 2013, while in all other regions, in this period, there was a decreasing of public risk (Figure 2), which is linked to

#### National level - Montenegro

According to the Status reports on road safety in Montenegro for 2007, 2010 and 2013 [15], the number of traffic fatalities on the roads of Montenegro declined from 122 in 2007, to 95 in 2010, to 74 in 2013, according to the linear legality. At the same time, the public risk is reduced from 19.8 in 2007, to 15.3 in 2010, to 11.9 in 2013, according to the linear legality (Figure 3). This indicates that interventions to improve national road safety achieved the goal to reduce the number of road traffic fatalities in Montenegro.





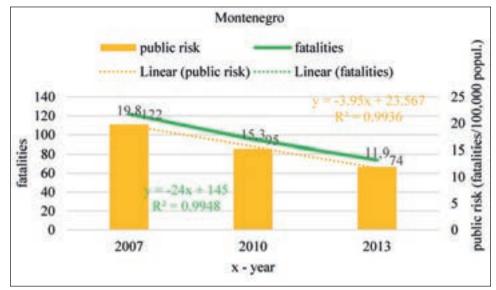


Figure 3. Changes in the number of fatalities and the public risk in Montenegro

The research of coordination of activities at the national level of road safety management in Montenegro, conducted by analyzing responses from the Questionnaire (Table 3), shows that further improvements in road safety are possible and that they will be generated by focusing on the road safety management system, based on coordination of activities and responsibility sharing.

# Local level - local communities-municipalities in Montenegro

For the local communities-municipalities in

Table 3. Questionnaire. Research of coordination of activities at the national level of road safety management in Montenegro

Questions	Yes	Partial	No
Are interventions being coordinated horizontally across competent bodies to achieve the desired focus on results?	Coordination body for supervising the implementation of the Strategy for improving the safety in road transport Ministry of the Interior Ministry of Transport and Maritime Affairs Ministry of Education Ministry of Health		
Are interventions being coordinated vertically between competent bodies to achieve the desired focus on results?		Government-municipalities Ministry of the Interior- Security Centres	
Has coalition partnership been built between competent bodies to achieve the desired focus on results?	Coordination body for supervising the implementation of the Strategy for improving the safety in road transport Ministry of the Interior Ministry of Transport and Maritime Affairs Ministry of Education Ministry of Health	Development banks NGOs	
Have Parliamentary committees and procedures supporting the coordination process been established to achieve the desired focus on results?	Law on Road Traffic Safety (2012, 2014) Law on the Bar-Boljare highway (2014) Status report on road safety(2015)		
Has legal responsibility of competent bodies to design road transport systems at the national level (area of roads, vehicles, behaviour and health care) been established to achieve the desired focus on results?	Law on Road Traffic Safety (2012, 2014) Law on Roads (2004, 2009, 2011) General Law on Education (64/2002) Law on Health Care (39/2004)		

Montenegro it has been analyzed only the period after the adoption of the Global Plan (2013 and 2014) [11], because in the Status reports on road safety in Montenegro for 2007 and 2010 there is no data for local communities-municipalities.

The public risk in road transport varies dramatically by municipalities in Montenegro, reaching unbelievable rate of 262.5 in Kolasin municipality and 193.2 in the municipality of Savnik, in 2013 rates of 92.4 in the municipality of Pluzine, and 47.8 in Kolasin municipality in 2014 (Figure 4 and 5).The rate of public risk of 262.5 in Kolasin, in 2013, was realized due to the tragedy of Romanian bus in the canyon Platije, where in one accident 18 people died and because Kolasin has 8,380 inhabitants [11], and in the municipality of Savnik due to the tragedy in the tunnel Ivica, where in one accident all four people died and because Savnik has 2,070 inhabitants [11].

The research of coordination of activities at the local level of road safety management in Montenegro, conducted by analyzing responses from the Questionnaire (Table 4), shows the coordination of activities at the

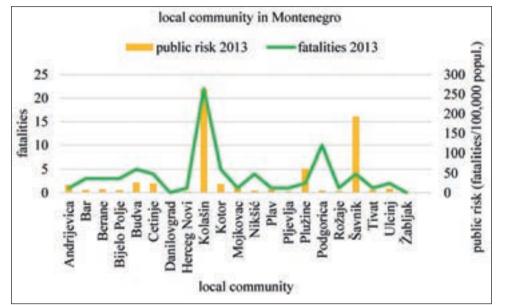


Figure 4. Changes in the number of fatalities and the public risk at local communities of Montenegro in 2013.

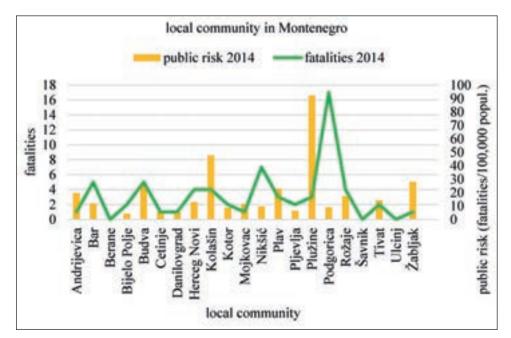


Figure 5. Changes in the number of fatalities and the public risk at local communities of Montenegro

Table 4. Questionnaire. Research of coordination of activities at the local level of road safety management in Montenegro

Questions	Yes	Partial	No
Are interventions being coordinated horizontally across competent bodies to achieve the desired focus on results?	Capital city	Larger municipalities	Smaller municipalities
Are interventions being coordinated vertically between competent bodies to achieve the desired focus on results?	Capital city	Larger municipalities Control of the traffic flow	Smaller municipalities
Has coalition partnership been built between competent bodies to achieve the desired focus on results?	Capital city	Larger municipalities Nongovernmental organizations	Smaller municipalities
Have Parliamentary committees and procedures supporting the coordination process been established to achieve the desired focus on results?		Decision on municipal and unclassified roads in the territory of the capital - Podgorica (2009)	Smaller municipalities
Has legal responsibility of competent bodies for roads at the local level been established to achieve the desired focus on results?		Decision on municipal and unclassified roads in the territory of the capital - Podgorica (2009)	Smaller municipalities

level of the capital city, a partial coordination in larger municipalities and a lack of coordination of activities in small municipalities. The establishment of the body for road safety at the community level, which would constantly upgrading the road safety on its territory, is not normatively regulated in Montenegro. However, road safety management at the local level can be set analogous to road safety management at the national level, so as to, for those purposes at the level of local communities, establish local institutions with the necessary resources, in the form from local agencies to advisers, depending on the size of the local community and the development of road traffic in it. By establishing of such a body, the local community would have an authority solely responsible for the area of road safety at the local community level, with a defined concrete tasks of continuous status monitoring, planning, organizing and coordinating activities, control of their implementation and effectiveness, to achieve the goal of improving road safety in the local community.

# CONCLUSION

The analysis of changes in the state of road transport safety in the period before (2007 and 2010) and the period after (2013 and 2014 years ago) the adoption of the Global Plan for the Decade of action for road safety 2011-2020, at global level within the world, regional level within WHO regions, national level within Montenegro, and local level within local communities of Montenegro, and the research of coordination of activities and responsibility-sharing at

these levels of road safety management, conducted by analyzing responses from the prepared Questionnaire, showed that the improvement or deterioration of the state of road safety at all these levels of management, particularly at the local level within the local communities of Montenegro, can be directly associated with the achievement of coordination of activities and sharing of responsibilities for the state of road safety.

By encouraging the development of the road safety system in local communities, and by establishing a local institution with the necessary resources, in the form from local agencies to advisers, depending on the size of the local community and the development of road traffic in it, the local community would have an authority solely responsible for the area of road safety at the local community level.

By developing a road safety system in local communities, basing on a vertical coordination in national and local activities and horizontal coordination in activities at the local level, with the establishment of a system of responsibility sharing for the state of road safety in local communities, a further reduction of mortality in road transport would be generated, because 2016 and coming years are the time to achieve results to improve road safety.

#### Bibliography

**Milenko Čabarkapa** was born on April 4, 1956 in Bijelo Polje (Montenegro). He finished Elementary School and High School in Bijelo Polje. He graduated from the Faculty of Transport and Traffic Engineering, Belgrade in 1981 at the Department for road and urban transport, Traffic regulation. His average grade at the Faculty was 8.10, while for the graduate thesis he received grade 10.

He completed post-graduate master studies at the Faculty of traffic, communication and logistics, Berane/Budva in 2013, with an average grade "A" (10.00) and defended his master thesis titled "State and trends in road safety in Montenegro", by which he gained the MA degree.

He passed the professional exam prescribed for the work in state administrative bodies.

In the professional and work engagement, he performed the following duties, among others:

- Since 1998, Founder and Director of the company for consulting, traffic and trade "Signal M", Ltd. Bijelo Polje.
- Since 2012, teaching assistant for the scientific area of safety in road traffic at the Faculty of traffic and communications management, Berane/Budva.
- Since 1982, permanent court expert. Since 2005, permanent court expert of Montenegro.
- Since 2002, member of the Chamber of Engineering of Montenegro.

He published and announced over 20 scientific and professional papers in country and abroad.

As a coordinator, he participated in drafting of: municipal spatial plans, general urban plan of municipality, detailed urban plan of city central zone, city traffic study and a number of urban plans and urban and traffic projects for the municipality territory.

As a court expert for the area of road safety, he drafted over 6,000 traffic accident expertises.

**Zoran Avramović** was born on September 10, 1953. He finished Elementary School and High School with honors. He finished the Faculty of Electrical Engineering, University of Belgrade with an average grade 9.71. He defended master thesis and PhD thesis at the same Faculty in 1988.

He is academician of:

- Russian Transport Academy,
- Russian Academy of Natural Sciences,
- Engineering Academy of Serbia,
- Academy of Electrical Engineering Sciences of the Russian Federation.

He is a professor at the following universities:

• Faculty of Transport and Traffic Engineering, University of Belgrade,

- Faculty of Electrical Engineering, University of Belgrade,
- Pan-European University "Apeiron", Banjaluka and
- Faculty of traffic, communication and logistics, Berane/ Budva.

He is the Head of the "Joint Department for Railway Management" at the Faculty of Transport and Traffic Engineering, University of Belgrade and the Head of "Department for information and communication technologies" at the Faculty of traffic, communication and logistics, Berane/Budva.

He is a professor (by invitation) at the following universities:

- Technical Faculty "St. Clement of Ohrid" in Bitola,
- University "Vitez" in Vitez, Travnik,
- University of East Sarajevo, Faculty of Transport and Traffic Engineering in Doboj and
  - American University in Skopje.

Awards (some)

- International electrical engineering congress held in Moscow awarded him with a Gold Medal of the Academy of Electrical Engineering Sciences of the Russian Federation (ΑЭΗ ΡΦ) for merits in the field of electrical engineering.
- He was included in the edition "Who is who in Bosnia and Herzegovina", 2015.
- Pursuant to the decision of the Union of ICT Societies of Serbia and Montenegro (JISA), he was proclaimed as an ICT expert (information-communication technologies) of Serbia and Montenegro and he was included in the ICT experts internet database.
- On the basis of his patents, he was included and presented by biography in the "Monography of inventors", issued by the Yugoslav Association of inventors and innovators.
- He was awarded with the "Vuk Stefanović Karadžić diploma", High School in Loznica.
- In order to mark an anniversary of the Faculty of Transport and Traffic Engineering, he was awarded as a sign of "recognition for the contribution to the development of the Faculty of Transport and Traffic Engineering".
- He was awarded with a plaque of the Faculty of Transport and Traffic Engineering from Zagreb "as a sign of special recognition for the outstanding personal contribution to the development of scientific research in the field of transport and traffic".
- He was included in the 7<sup>th</sup> edition of the "International Directory of Distinguished Leadership", according to the choice of the American Biographical Institute, Inc. (Raleigh, North Carolina, USA).

### REFERENCES

- [1] Bliss T. and Breen J. 2009. Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Global Road Safety Facility, World Bank, Washington. http://siteresources.worldbank.org/EXTTOPGLORO-ASAF/Resources/traffic\_injury\_prevention
- [2] Bliss T. and Breen J. 2013. Road Safety Management Capacity Reviews and Safe System Projects Guidelines, updated edition. web.worldbank.org > ... > Global Road Safety F
- [3] Commission for Global road safety 2009. Make Roads Safe A Decade of action for road safety. http://www.fiafoundation.org/our-work/make-roads-safe
- [4] DaCoTA 2012. Road Safety Management, Deliverable 4.8p of the EC FP7 project DaCoTA. London.http://safetyk-nowsys.swov.nl/Safety\_issues/pdf/Road%20Safety%20Management.pdf.
- [5] Dupont E. et al. 2012. Needs for Evidence-Based Road Safety Decision Making in Europe. https://www.research-gate.net
- [6] Elvik R. 2012. Does the use of formal tools for road safety management improve safety performance? In the Proceedings of the 2012 TRB. Annual Meeting. Transportation Research Board. Washington DC. https://www.toi.no/ staff/elvik-rune-article17618-27.html
- [7] ETSC 2001. Sharing responsibilities for road safety.http://archive.etsc.eu/documents/bri\_road4.pdf
- [8] ISO 2012. RTS-Road Traffic Safety: ISO 3901:2012. http://www.iso.org/iso/catalogue\_detail.htm?csnumber=44958
- [9] Jahi H. et al. 2012. Investigating road safety management processes in Europe. https://www.researchgate. net/2015.09.15
- [10] Koornstra M. et al. 2002. SUNflower: a comparative study of the development of road safety in Sweden, the United Kingdom, and the Netherlands. SWOV, Dutch Institute for Road Safety Research. Leidschendam. ec.europa.eu/ transport/roadsafety\_library/.../sunflower\_report.pdf.
- [11] MONSTAT 2015. Montenegro Statistics. www.monstat.org. Montenegro Gazzete 2015. Law on Road Traffic Safety, No. 33/12, 58/14; Law on the Bar-Boljare highway, No. 52/14; Law on Roads, No. 42/04, 40/10, 36/11; General Law on Education, No. 64/02; Law on Health Care, No. 39/04; Decision on municipal and unclassified roads in the territory of the capital – Podgorica, No. 11/09
- [12] Muhlrad N., Gitelman V.and Buttler I. 2011. (Ed). Road safety management investigation model and questionnaire. Deliverable 1.2 of the EC FP7 project DaCoTA. www.dacota-project.eu/.../DaCoTA.
- [13] Muhlrad N. et al. 2014. Analysis of road safety management systems in Europe. http://tra2014.traconference.eu/ papers/pdfs/TRA2014\_Fpaper\_18440.pdf
- [14] New Zealand. National Road Safety Committee. Land Transport Safety Authority. 2000. Road Safety Strategy 2010: A Consultation Document.
- [15] www.imvia.co.nz/.../mot\_safer\_journeys\_discussion (5th may 2016)
- [16] OECD/ITF 2012. Sharing Road Safety Developing an International Framework for Crash Modification Functions. http://www.oecd-ilibrary.org/transport/sharing-road-safety\_9789282103760-en
- [17] Papadimitriou E. et al. 2012. Analysis Of road safety management in the European countries. D 1.5 DaCoTA.http://www.dacota-project.eu/Deliverables/Dacota\_Deliverable1.5\_Vol.2\_final.pdf
- [18] SafetyNet 2009. Road Safety Management. http://ec.europa.eu/transport/road\_safety/specialist/erso/pdf/safety\_issues/policy\_issues/07-road\_safety\_management\_en.pdf
- [19] The World Bank 2013. Global Road Safety Facility, Strategic Plan 2013-2020. web.worldbank.org > ... > Global Road Safety F
- [20] UN GS 2010. Improving global road safety. A/RES/64/255. http://www.who.int/violence\_injury\_prevention/publications/road\_traffic/UN\_GA\_res
- [21] UN GS 2014. Improving global road safety. A/RES/68/269. http://www.who.int/violence\_injury\_prevention/publications/road\_traffic/UN\_GA\_res
- [22] Wegman F. 2001. Sharing responsibility central and local government partnership. https://www.researchgate.net
- [23] Wegman F. et al. 2015. Evidence based and data driven road safety management. https://www.researchgate.net
- [24] WHO 2004. World report on road traffic injury prevention. Geneva. http://whqlibdoc.who.int/publications/2004/9241562609.pdf
- [25] WHO 2009, 2013a, 2015a. Global status report on road safety. http://www.un.org/ar/roadsafety/pdf/roadsafetyreport.pdf
- [26] WHO 2011. Global Plan for the Decade of Action for Road Safety 2011-2020. http://www.un.org/en/roadsafety
- [27] WHO 2013b. Second UN Global Road Safety Week. http://www.who.int/violence\_injury\_prevention/road\_traffic/ en/

[28] WHO 2015b.Third UN Global Road Safety Week. http://www.who.int/violence\_injury\_prevention/road\_traffic/en

- [29] WHO 2015c. 2nd Global High-Level Conference on Road Safety. http://www.who.int/violence\_injury\_prevention/ en
- [30] Yannis G., Laiou A. and Piccoli G. 2015. Road Safety in South-East European Regions.https://www.researchgate.net

Submitted: June 1, 2016. Accepted: June 7, 2016.