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THE ROLE OF THE ACADEMIC COMMUNITY IN ROAD SAFETY

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Abstract: Road safety is a complex, multidisciplinary systemic problem whose lasting and measurable improvement cannot be achieved without a science-based approach. This paper systematizes and analyzes the roles that the academic community plays within the road safety system, starting from the premise that no other societal actor – neither the state, nor industry, nor the civil sector – is able, on its own, to ensure continuous monitoring of international knowledge, the creation of new knowledge, the education of professional personnel, and independent, evidence-based evaluation of road safety measures. Drawing on the multi-decade experience of the Faculty of Transport and Traffic Engineering, University of Belgrade, the paper identifies and elaborates eight interrelated roles of the academic community: knowledge transfer, research and projects, creation of new knowledge, application of new knowledge in practice, student education, training and continuous professional development, cooperation and support to other road safety stakeholders, and dissemination of knowledge. Particular attention is given to the significance of these roles for local self-government units, which frequently lack the capacity to independently conduct analyses, prepare strategic documents, or perform expert evaluation of measures, and therefore depend substantially on cooperation with the academic community. The paper concludes that investment in road safety science is a highly cost-effective investment, and that without it, improvements in road safety will remain slow, incidental, or absent altogether.

Keywords: road safety, academic community, road safety science, education, knowledge dissemination, local community

1. INTRODUCTION

Today, in line with the modern international framework known as the "Safe System Approach," road safety is considered a responsibility of society as a whole, rather than solely that of road users (PIARC, 2026; EC, 2023). According to the latest World Health Organization report on the global status of road safety, approximately 1.19 million people lose their lives on the world's roads annually – more than 3,200 per day – and road traffic crashes remain the leading cause of death for children and young people aged 5–29 (WHO, 2023). Despite some reduction in fatalities compared to 2010, the pace of decline has been deemed "far too slow" relative to the global targets set for the Second Decade of Action for Road Safety (WHO, 2023). This situation clearly demonstrates that intuitive, experience-based, or purely administrative approaches to

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road safety are insufficient; a systemic, evidence- and data-driven approach is essential, and this is precisely where the academic community plays an indispensable role.



Figure 1. Safe System Approach

The role of the academic community in road safety is rarely addressed systematically and comprehensively as a distinct topic in the region's professional and scientific literature; instead, it is largely implied through individual research findings, projects, or educational activities. This paper aims to explicitly systematize and analyze this role, illustrating it with concrete examples – drawing on the decades of experience of the Faculty of Transport and Traffic Engineering at the University of Belgrade (specifically its Department of Road Safety) and the University of Criminalistic Investigation and Police Studies – and to highlight the practical significance of this role.

The paper is structured as follows: the second chapter explains the importance of science and data as the foundation of the modern approach to road safety; the third chapter provides a detailed analysis of eight interconnected roles of the academic community; the fourth chapter illustrates these roles using the specific examples of the Faculty of Transport and Traffic Engineering and the University of Criminalistic Investigation and Police Studies; the fifth chapter discusses the significance of these roles for the local community; and the sixth chapter presents concluding remarks.

2. SCIENCE AND DATA AS THE FOUNDATION OF A MODERN APPROACH TO TRAFFIC SAFETY

The modern approach to road safety is based on the systematic monitoring of international documents, best practices, and scientific findings, as well as their active integration into national and regional contexts. This entails the continuous monitoring of key international strategic documents (e.g., those from the United Nations, the World Health Organization, and the European Union), alongside leading scientific journals, monographs, and studies in the field of road safety.

The standardization and harmonization of road accident data play a pivotal role in this process. The CADaS (Common Accident Data Set) protocol, developed at the European Union level, provides a shared dataset for road accidents that enables data comparability across member states and associated countries (EC, 2026). Similarly, methodologies for monitoring and reporting on road safety performance indicators (SPIs) allow for the tracking of antecedent "process" indicators regarding the state of road safety – in addition to final outcomes (fatalities and injuries) – thereby enabling earlier and more precise interventions. Research projects such as ESRA (European Survey of Road Users' Safety Attitudes) provide internationally comparable data on the attitudes and behavior of road users – collected via surveys across dozens of countries [ESRA, 2026] – while similar national studies (e.g., SARTRE) enable the monitoring of the domestic situation and comparison with regional and European averages. Benchmarking methodologies, based on the comparative analysis of road safety indicators across countries, regions, or local communities, serve as an additional analytical tool for identifying best practices and priority areas for action.

Finally, integrated databases on traffic accidents and road safety characteristics form the infrastructural foundation for evidence-based road safety management. Serbia's participation in the European CARE database (Community database on Accidents on the Roads in Europe) enables the comparability of domestic data with that of other European countries and represents a tangible result of the long-standing efforts by the academic community and competent institutions to harmonize and improve the quality of accident data.

All the elements mentioned – monitoring international documents, data harmonization, performance indicators, surveys, and integrated databases – constitute what this paper refers to as "science" in the strict sense: a systematic, methodologically grounded foundation without which road safety management becomes arbitrary and ineffective. This function represents the first and, in a sense, the most fundamental role of the academic community, a topic elaborated upon in greater detail in the following chapter.

3. ROLES OF THE ACADEMIC COMMUNITY IN THE TRAFFIC SAFETY SYSTEM

Drawing on university experience, it is possible to identify eight interconnected yet conceptually distinct roles that the academic community plays within the road safety system. These roles are not isolated; they form a closed cycle in which each role feeds into the next: science and data (Chapter 2) enable knowledge transfer; knowledge transfer guides research and projects; research generates new knowledge; new knowledge is applied in practice and disseminated through education and training; and collaboration and dissemination ensure the cycle remains open and connected to society.

3.1. Knowledge transfer

Transfer of knowledge - systematic monitoring and introduction of international documents, standards, methodologies and best practices in the domestic and regional context - represents the main, fundamental role of the academic community. As a rule, no other institution of the traffic safety system (police, road managers, local self-government, prosecutor's office) has either the mandate or the capacity to continuously monitor the world's scientific and professional production in this area and to critically evaluate, adapt and make it applicable in its own context. The academic community fulfills this role through teaching, professional literature, participation in the drafting of regulations and strategic documents, consulting work and direct communication with decision makers.

3.2. Research and Projects

Participation in research projects – including European initiatives (such as EU-funded projects like ESRA), projects led by international organizations (e.g., the United Nations, the World Health Organization), and other international and national projects (such as the development of national road safety strategies) – represents another key channel through which the academic community fulfills its role. A particularly significant category comprises road infrastructure safety projects (including road safety audits, road safety inspections, management of accident concentration sites – or "black spots" – independent road safety assessments, and risk mapping), as well as projects directly serving local communities, such as the development of strategic road safety documents and action plans and the resolution of specific, locally relevant road safety issues.

3.3. Creating new knowledge

Scientific research generates new knowledge, scientific achievements, and methodologies, which are systematized and incorporated into curricula and professional literature. This process unfolds at multiple levels: through hundreds of student seminar papers, bachelor's thesis, and master's theses; through dozens of doctoral dissertations in the field of traffic safety; and through hundreds of scientific and professional papers and studies published in relevant journals and presented at conferences – such as the one where this paper is being presented. It is precisely this continuous influx of new, empirically and methodologically grounded knowledge that distinguishes the academic approach to traffic safety from a purely administrative or experience-based approach.

3.4. Application of new knowledge in practice

The work of the academic community does not end in the lecture hall or the laboratory. New knowledge and methodologies are continuously applied directly to traffic safety practice: in the development of new research methods, traffic accident investigations, road safety indicator studies, safety-oriented road design, the formulation of traffic safety strategies and action plans, the design and evaluation of traffic safety campaigns, and tasks related to road infrastructure safety in the strict sense. This role serves as a crucial link between "pure" science and the operational, day-to-day improvement of traffic safety in the field.

3.5. Student Education

Educating future professionals is one of the most recognizable, though not the only, role of the academic community. For instance, the Faculty of Transport and Traffic Engineering at the University of Belgrade offers undergraduate academic studies (four years), master's studies (two years), and doctoral studies (three years), organized into nine modules – including a specialized module dedicated exclusively to traffic safety. This multi-level, modular educational system enables the development of professionals with diverse profiles and levels of specialization, ranging from engineers who enter professional practice immediately after their undergraduate studies to researchers and university faculty who pursue further professional development through doctoral studies. Similarly, the University of Criminal Investigation and Police Studies – through its Department of Criminalistics – trains police officers and graduates (undergraduate academic studies of three and four years) who take Traffic Safety as a mandatory course; upon graduation, they are employed by the Ministry of the Interior equipped with at least a baseline level of knowledge regarding traffic safety.

3.6. Training and continuous professional development

In addition to formal degree-granting education, the academic community plays a significant role through continuous professional development programs aimed at practicing professionals and other target groups. Examples of such programs include: practical training for prosecutors and police officers on conducting independent road safety assessments; courses on road safety auditing and inspection lasting up to 40 days; training on road safety management at the local level; courses for driving instructors and lecturers; training for police and prosecutors on investigating traffic accidents; road safety education programs for preschool educators and primary school teachers; and professional training and development for forensic experts specializing in the technical analysis of traffic accidents. This diversity of target groups – ranging from the youngest participants in the educational system to police, prosecutors, and forensic experts – demonstrates that the academic community acts as a cross-cutting provider of professional development across the entire road safety system, rather than operating solely within its own educational programs.

3.7. Cooperation and support for other entities

The academic community fulfills its role through direct cooperation with and support for numerous other entities within the road safety system: participating in projects, training programs, and the drafting of strategic documents for other institutions; providing training and expert analysis related to traffic accidents; participating in working groups for drafting regulations, conducting surveys, and mapping risks; promoting key documents and projects; engaging in training, evaluation, and the preparation of professional literature and books; conducting surveys, studies, consultations, and expert assessments; and addressing practical road safety issues through direct expert input. This role positions the academic community as the connective tissue of the road safety system, as it links stakeholders who otherwise lack direct institutional connections – such as the police, the prosecution, road authorities, local government, the non-governmental sector, and the business community.

3.7. Dissemination (spreading) of knowledge

The final – though by no means least significant – role involves the active dissemination of knowledge to both the professional community and the general public through various channels: participating in and presenting at conferences (such as this one), conducting training sessions, making radio and television appearances, authoring professional and educational books, delivering lectures at gatherings, participating in bodies and commissions responsible for road safety and in working groups, contributing to podcasts and newspaper articles, and publishing papers in scientific journals. Knowledge dissemination ensures that the results of scientific research do not remain confined to the academic community but become accessible to decision-makers, professionals, and the public – thereby closing the cycle illustrated at the beginning of this chapter and returning knowledge to the society from which it originally emerged through data and experience.

4. EXAMPLES: FACULTY OF TRANSPORT AND TRAFFIC ENGINEERING, UNIVERSITY OF BELGRADE, AND ACADEMY OF CRIMINALISTIC AND POLICE STUDIES, BELGRADE

The aforementioned roles are not abstract categories; they can be concretely illustrated through the experiences of these two academic institutions.

The Faculty of Transport and Traffic Engineering at the University of Belgrade is an institution with a 75-year history (founded in 1950) that has educated over 10,000 traffic engineers, more than 300 holders of master's degrees in traffic engineering, and over 200 holders of doctorates in technical sciences. Within the Faculty, the Department of Traffic Safety operates; through a specialized educational module, numerous scientific research projects, consultancy work, and continuous professional development programs, it fulfills all the roles described in the previous chapter.

The University of Criminal Investigation and Police Studies – as the legal successor to the College of Internal Affairs (founded in 1972) and the Police Academy (founded in 1993) – maintains an unbroken 54-year tradition of police officer training and education, during which all the roles described in the previous chapter have likewise been fulfilled.

These examples hold dual value for this paper. First, they confirm that the stated roles are not merely theoretical constructs but can be empirically documented through specific figures, programs, and activities of institutions that have been operating continuously for over five and seven decades, respectively. Secondly, it demonstrates that fulfilling the full spectrum of these roles requires institutional stability, a critical mass of expert personnel, and long-term commitment – conditions that are not easily secured outside the university framework and that substantiate the claim that the academic community plays an indispensable, rather than merely supplementary, role within the road safety system.

5. SIGNIFICANCE FOR THE LOCAL COMMUNITY

Local communities – particularly smaller ones – generally lack the internal capacity to independently conduct complex analyses of road safety conditions, draft strategic documents and action plans, carry out independent road safety assessments and audits, or provide expert evaluation of proposed measures. In this context, cooperation with the academic community is not a luxury for local self-government; rather, it offers a practical and cost-effective way to

access the necessary expertise without the need to maintain an in-house team of specialized staff, which would be expensive and difficult to sustain.

In practice, this cooperation encompasses: the development of local strategic documents and road safety action plans; training for local officials responsible for road safety management; conducting road safety audits and inspections on the local road network; identifying and addressing accident hotspots; surveying the attitudes and behaviours of road users at the local level; and benchmarking local road safety indicators against those of other comparable communities.

Experience in the region demonstrates the tangible results of this approach: in Republika Srpska, during the 2011–2023 period, the number of fatalities in traffic accidents has decreased by 33.1%, while the economic costs of traffic accidents remain at an estimated 3.7 billion convertible marks annually (CESIT, 2024) – a figure demonstrating both that significant results have been achieved and that there remains substantial economic scope for further, evidence-based investment in road safety. The preparation of the new Road Safety Strategy of Republika Srpska for the 2025–2034 period (CESIT, 2024) exemplifies the ongoing need of local and entity authorities for the kind of expert support that can be systematically provided only by the academic community.

6. CONCLUSION

The analysis conducted in this paper demonstrates that the academic community within the road safety system performs eight interconnected roles – knowledge transfer, research and projects, the creation of new knowledge, the practical application of new knowledge, student education, training and continuous professional development, cooperation with and support for other stakeholders, and knowledge dissemination – which together form a closed, self-renewing cycle. The ultimate outcome of this cycle is the improvement of road safety based on data and science, rather than on improvisation or mere administrative procedure.

Based on the foregoing, the following conclusions can be drawn:

1. Road safety risks cannot be effectively and permanently reduced without the science of road safety.
2. The academic community is essential for the successful and effective development and enhancement of road safety, as no other system stakeholder possesses a comparable mandate, capacity, and continuity to fulfill the described roles.
3. The science of road safety can make the greatest contribution to establishing a road safety system and developing all its elements, including the transition from a traditional approach to the "Safe System" approach.
4. The academic community is responsible for monitoring global scientific knowledge, introducing it to the country and region, developing new knowledge, and ensuring its application and dissemination.
5. The academic community can provide significant assistance to all road safety system stakeholders – including local self-government units – provided that high-quality, long-term cooperation is established and maintained.
6. Investment in road safety, and particularly in the science of road safety, represents a highly cost-effective investment.

7. Without systematic investment in science, improvements in road safety will be slow, sporadic, or entirely absent.

These conclusions have a direct practical implication for local communities and decision-makers at all levels: long-term, institutionalized cooperation with the academic community should become an integral – rather than occasional or exceptional – part of the road safety management system, including at the local government level.

7. ЛИТЕРАТУРА

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