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REVIEW SCIENTIFIC PAPER

Training of professional drivers under current regulatory conditions

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Abstract: The aim of this paper is a comparative analysis of the impact of contemporary regulatory changes in the European Union and the Republic of Serbia on the training system for professional drivers of commercial vehicles, with an emphasis on their role in improving road traffic safety. Particular attention is given to the evolution of the regulatory framework in the period 2003–2022, from Directive 2003/59/EC to Directive 2022/2561/EC, which advances the system through the digitalization of teaching, the promotion of environmentally responsible and safety-oriented driving, and the application of more flexible learning methods. The research is set within the context of the global initiative Second Decade of Action for Road Safety 2021–2030, whose goal is to reduce the number of road traffic fatalities by at least 50% (United Nations, 2021). The starting hypothesis of the paper is that the alignment of the national training system with European standards significantly contributes to the improvement of road transport safety and efficiency. The research is based on descriptive, analytical, comparative, and synthetic methods, supplemented with statistical indicators and case study analysis. Special emphasis is placed on the challenges of harmonizing the national training system with European standards—institutional, technological, and pedagogical–andragogical. Based on the analysis, recommendations have been formulated aimed at strengthening intersectoral cooperation, modernizing training programs, and supporting the continuous professional development of drivers, thereby contributing to the creation of safer and more competent road users.

Key words: road safety, driver competencies**,** driver training, professional drivers, regulatory framework.

INTRODUCTION

Professional drivers of commercial vehicles represent one of the key categories of participants in the road traffic, as their competencies directly influence the safety, efficiency, and sustainability of the transport system (Road Traffic Safety Agency [RTSA], 2022). In the context of dynamic changes in the transport policies of the European Union (EU) and the Republic of Serbia, the quality of initial and periodic driver training gains strategic importance.

Modern regulatory frameworks, such as Directive 2003/59/EC, guide the training of professional drivers through standardized programs and a minimum number of training hours, with the aim of improving road traffic safety (European Commission, 2003).

By adopting Directive 2003/59/EC, the European Union established uniform standards for the initial and periodic training of professional drivers, emphasizing professional competence as a prerequisite for safe and efficient driving (European Commission, 2003). Directive 2022/2561/EC further strengthens this framework by introducing digitalized training processes, promoting environmentally responsible and safety oriented driving, and enabling more flexible learning methods tailored to adult learners (European Commission, 2022). These changes carry significant institutional, pedagogical, and andragogical implications.

At the global level, these reforms align with the United Nations initiative "Second Decade of Action for

Road Safety 2021–2030," which aims to reduce the number of road traffic fatalities by at least 50% (United Nations, 2021). The initiative emphasizes a systemic and intersectoral approach to road traffic safety, within which professional drivers play a key role.

In the Republic of Serbia, the process of harmonizing national regulations with European standards is accompanied by a number of challenges, particularly concerning institutional capacity for implementing modern instructional models, the technological infrastructure required for digitalization, and methodological adjustments specific to adult education (European Commission, 2025; Zdravković, 2025). Although there is awareness of the importance of modernizing the system, practice shows a continued need for additional investments in training programs, personnel, and methods of continuous professional development for drivers (Zdravković, 2025).

Based on the above, the aim of this paper is to analyze the impact of contemporary regulatory changes on the professional driver training system, with emphasis on the institutional, technological, and pedagogical-andragogical aspects of their implementation in Serbia. The scientific contribution lies in the comparative analysis of European and national training models, the identification of implementation challenges, and the formulation of recommendations for improving instructional practice and road traffic safety policies (European Commission, 2022; United Nations, 2021)

MATERIALS AND METHODS

The research is based on a systematic analysis of domestic and international literature, with emphasis on online sources and relevant professional publications (Elvik & Vaa, 2021; European Commission, 2003; ABS, 2022). Special attention was given to legal regulations from both national and international legislation, focusing on the (EU27) countries and the analysis of directives governing the training of professional drivers (European Commission, 2022). Additional data were drawn from reports issued by national and international institutions on road traffic accidents, as well as from quality and safety management standards, primarily ISO 9001 and ISO 39001 (Johansson, 2012).

The following methods were applied in the research:

- **Descriptive method** – used to describe phenomena and processes within professional driver training models in EU27 member states and in the Republic of Serbia, as well as to outline guidelines for their improvement.
- **Analytical method** – used to analyze existing models and the state of road traffic safety in the observed countries.
- **Comparative method** – used to compare training models and statistical indicators of road traffic safety.
- **Synthetic method** – used to integrate results and connect training models with safety indicators for commercial vehicle drivers.
- **Statistical method** – used to analyze quantitative data on traffic accidents, driver performance, and the effectiveness of instructional models.

In addition, the results of initial and periodic training were analyzed, including examination outcomes, candidate evaluations on standardized tests, as well as the results of seminars and other continuous professional development programs (Zdravković, 2025; European Commission, 2025). This approach provided a comprehensive overview of the impact of regulatory changes on the training system and the competencies of professional drivers, with particular emphasis on driving safety and quality. A limitation of the study is the insufficient number of empirical studies on the effects of the new directives in Serbia, which necessitates reliance on comparative and indirect indicators.

RESULTS

The research showed that the evolution of the EU regulatory framework, through Directive 2003/59/EC and its amendment 2022/2561/EC, has a significant impact on the quality of professional driver training and road-traffic safety. Although the directives establish standards for qualification and periodic training, a unified system for evaluating learning outcomes is still lacking, as is precise regulation regarding instructional personnel and teaching methodologies. This highlights the need for improved harmonization of training systems, the application of digital and flexible learning methods, and continuous evaluation processes to monitor the level of competencies achieved (European Commission, 2003; European Commission, 2022).

Evolution of the EU Regulatory Framework

The historical development of regulations governing the training of professional drivers in the European Union began with the adoption of Directive 76/914/EEC (Council of the European Communities, 1976), which initiated the process of standardizing qualifications. Although training initially had a recommended (non-mandatory) character in most countries, states such as France and the Netherlands introduced compulsory programs, reflecting their early recognition of the importance of systematically developing professional competencies. Due to global socio-economic changes during the 1980s, an increased demand for transport services emerged, along with a simultaneous shortage of qualified drivers, which negatively affected road traffic safety and efficiency.

The publication of the White Paper on Transport (European Commission, 1992) marked the beginning of transport market liberalization within the EU and highlighted the importance of professional driver competencies for traffic safety. Standardization of training continued with Directive 2003/59/EC, which introduced mandatory initial and periodic training (CPC), focusing on safe driving and harmonized criteria across the EU (European Commission, 2003). Directive 2022/2561/EC further expanded the framework by incorporating digital technologies, flexible learning methods, and the promotion of environmentally responsible driving tailored to adult learners (European Commission, 2022).

Besides regulatory measures, the ISO 39001 standard also makes a significant contribution to road traffic safety by improving systemic road traffic safety management. A study conducted in 141 companies in Sweden showed that 40% of organizations achieved financial benefits, while 72% assessed the implementation of the standard as highly effective (Johansson, 2012), which supports the long term vision of the European Commission for "zero fatalities by 2050" (European Commission, 2011).

Although the regulatory framework contributes to improving safety, its effectiveness is limited due to insufficiently precise definitions of learning outcomes and weak integration of digital tools and driver-assistance systems (Sullman, Dorn & Niemi, 2021; Samuel & Rowe, 2023; Silla & Laitinen, 2023). Simulation-based and situational training show potential for the development of cognitive and psychomotor skills, but convincing evidence on their long-term impact on reducing accident risk is still lacking.

One of the key challenges in the professional driver training system is the absence of systematic evaluation of training outcomes and their impact on driver behavior under real-world traffic conditions (Elvik & Vaa, 2021). Research indicates that the application of driving simulators remains limited and insufficiently integrated into risk-management strategies (Murray & Watson, 2023), while the lack of continuous instructor development leads to a predominant focus on exam preparation rather than on cultivating a safety culture and defensive driving styles (Watson-Brown, Scott-Parker, Simons-Morton & Senserrick, 2020).

Despite these limitations, European directives and standards have significantly contributed to improving professional training and enhancing road traffic safety, providing a foundation for adaptation and advancement of training within national contexts, such as Serbia (European Commission, 2003, 2022). Continuous evaluation and monitoring of acquired competencies remain essential for further development of the system.

Analysis of the Regulatory Framework in Serbia

The national framework for the training of professional drivers in the Republic of Serbia has been developing gradually, with increasing alignment to the regulations and standards of the European Union. Based on its own road safety priorities and EU recommendations, Serbia adopted a new Road Traffic Safety Act in 2009 (Road Traffic Safety Act, 2009, Article 203), establishing the foundation for structuring a professional driver training system.

Key developments followed in 2018 with the adoption of two by-laws:

- Rulebook on the Conditions and Method for Obtaining a Certificate of Professional Competence and the Driver Qualification Card (Official Gazette of the Republic of Serbia, No. 102/2018), and
- Rulebook on the Requirements for Legal Entities Providing Professional Driver Training (Official Gazette of the Republic of Serbia, No. 102/2018, 29/2025).

These regulations represent the core legislative instruments that define the standards, organizational requirements, and certification procedures for the professional training of commercial drivers in Serbia.

These by-laws introduced mandatory training and examination for acquiring professional competence. Drivers who had obtained licenses for categories C1, C1E, C, CE, D1, D1E, D, and DE by 30 December 2019 were granted recognition of their existing rights, in accordance with Directive 2003/59/EC (Directive 2003/59/EC, 2003, Article 4).

The training model in the Republic of Serbia is largely aligned with Directive 2003/59/EC. It prescribes mandatory training of a specified number of hours and examinations, with exceptions for drivers holding recognized rights. The system includes standard and accelerated programs, as well as additional training for qualification upgrades, similarly to Article 5(5) of Directive 2003/59/EC.

The types of mandatory training include:

- **Initial training –** at least 280 teaching hours,
- **Accelerated initial training –** at least 140 teaching hours,
- **Additional training –** at least 70 teaching hours,
- **Additional training** (shortened) – at least 35 teaching hours.

The main difference between the Serbian and European training models lies in the criterion used to select the program. While the EU links the type of training to the driver's age, Serbia applies an educational-level criterion: drivers with at least three years of secondary education attend accelerated training, whereas others complete the full 280-hour program. Specifically, drivers who have completed at least three years of secondary education undergo the 140-hour accelerated initial training, while those without this educational level must complete the full 280-hour program (Table 1).

Table 1. Driver Training Model in the Republic of Serbia

License Category	Driving Category	Age for Qualification Access		Education/Number of Training Hours		Additional Training	
Freight Transport	C1, C1E, C and CE	C1, C1E	C and CE	Initial – Category II Vehicle	280	70	Passenger Transport
		18	18	Category III and above	140	35	
		/	**18***	Recognized Rights / Driver with Level III Vocational Education*		35	
Passenger Transport	D1, D1E, D and DE	D1, D1E	D and DE	Initial – Category II Vehicle	280	70	Freight Transport
		18	21	Category III and above	140	35	
		/	/	Recognized Rights		35**	

* A driving license for categories C and CE may be obtained by a secondary school student who has completed a diploma program in the Motor Vehicle Driver profile; the initial qualification for freight transport is recognized for such individuals.

** A driver who has exchanged a driving license from another country for a Republic of Serbia driving license, and who had completed category D before 30 December 2019, is granted recognition of acquired rights for passenger transport, while category C was obtained after 30 December 2019.

Note: Data sourced from Zdravković, Gladović, & Zdravković (2022).

Periodic training, in accordance with Article 7 of the Directive, comprises 35 hours of instruction within a five-year cycle (Directive 2003/59/EC, 2003, Article 7). This form of training is also mandatory for drivers with recognized acquired rights.The requirements for instructional staff in Serbia are relatively strict: lecturers were required, at the time of certification, to have at least a Level VII vocational qualification and one year of work experience, while instructors had to possess at least three years of work experience or five years of international experience as drivers holding a Driver Qualification Card. Compared to the Directive, which allows greater flexibility for Member States, the Serbian model is more restrictive (Directive 2003/59/EC, 2003).Amendments to the Law in 2025 introduced significant changes: training is no longer mandatory for all participants, except for young drivers obtaining licenses before the age of 21.

Additionally, the validity of the Driver Qualification Card was extended to seven years for licenses issued until 31 December 2020, removing the obligation to attend five interim seminars (Law on Amendments and Supplements to the Road Traffic Safety Act, 2025).

Although these measures reduce costs and administrative burdens, they raise concerns regarding the continuity of professional education and the control of driver competencies. The closure of training centers and the reduction of training programs may have a negative impact on road-traffic safety.

In contrast, Directive 2022/2561/EC emphasizes the importance of standardized programs, digitalization of instruction, support for teaching staff, and environmentally responsible driving (European Commission, 2022), providing guidance for the further development of the system in Serbia.

Statistical Trends

Alignment of the training system with European standards demonstrates a significant impact on reducing the number of road-traffic accidents. While EU countries report a stable decline in accident numbers, Serbia shows

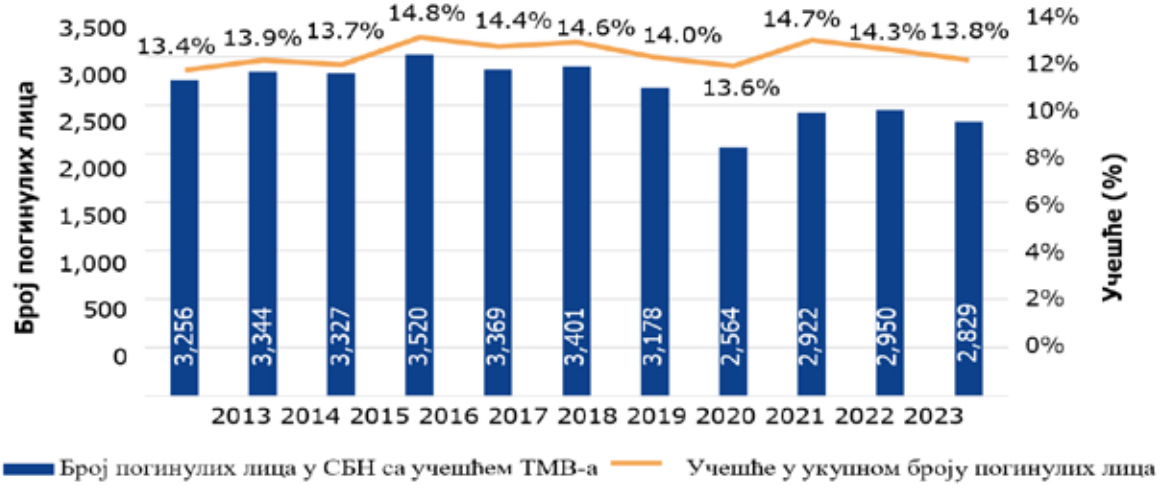

Figure 1. Annual Number of Fatalities in Accidents Involving HGVs and Their Share of Total Fatalities in the EU27 (2013–2023).

Source: European Commission, 2025

positive, but slower trends (European Commission, 2025; Schindler, Smith & Müller, 2022). According to data from the European Commission (2025), heavy goods vehicles (HGVs) are involved in approximately 4–5% of accidents in EU countries, but are responsible for roughly 14% of fatalities (see Figure 1).

Similar issues are observed in the field of passenger transport, where buses are involved in 2% of all fatal road-traffic accidents, with victims frequently being pedestrians (25%) (European Commission, 2025; see Figure 2). These data highlight the need for more intensive and higher-quality training, with a particular focus on the protection of vulnerable road users.

Directive 2022/2561/EC establishes the minimum requirements for obtaining professional driving licenses for categories "C" (18 years) and "D" (21 years) following completion of the prescribed training, thereby directly linking the acquisition of professional driving categories to vocational qualifications. At the same time, EU strategic documents emphasize the importance of digitalization of driving licenses, harmonization of training standards, assessment of psychophysical abilities, and continuous improvement of training to enhance safety and driving quality across all Member States (European Commission, 2018, 2020, 2022, 2023).

The objective is to ensure a unified and transparent system of training and certification that strengthens the safety culture, standards of instructional staff, and driver competencies across the European Union, in line with the "Vision Zero" concept and the medium-term targets for reducing fatalities and serious injuries by 2030 (European Commission, 2019; European Commission, 2022).

According to available data from the Road Traffic Safety Agency of the Republic of Serbia, between 2017 and 2021 there were 640 fatal accidents (FA) involving commercial vehicles (freight vehicles and buses) and 13,238 accidents involving commercial vehicles with injured persons (IA). Accidents involving commercial vehicles with fatalities account for **26% of all fatal road-traffic accidents**. In these accidents, 734 people were killed and 21,015 were injured, **representing approximately 27% of all fatalities** (FA) and 21% of **all injured persons** (IA) in road-traffic accidents (Road Traffic Safety Agency [ABS], 2022).

Of the total number of fatalities in accidents involving commercial vehicles, 623 people (85%) were killed in accidents involving at least one freight vehicle, 128 people (17%) in accidents involving at least one bus, and 17 people (2%) in accidents involving both a truck and a bus ([ABS], 2022).

These data confirm that professional drivers and commercial vehicles have a significant impact on road safety. While the EU records a decline in accidents due to standardized training, Serbia shows a slower but positive trend. Despite the lower involvement of commercial vehicles in the total number of accidents, these vehicles cause a disproportionately high number of fatalities, particularly among vulnerable road users. This indicates the need for Serbia to improve its training system in line with European standards, using digital tools and flexible educational approaches. Alignment with Directive 2022/2561/EC is crucial for reducing the most severe accidents and enhancing road safety.

Research Results on the effectiveness of periodic training for professional drivers in Serbia

The study encompassed 4,193 professional drivers who possessed an initial qualification obtained either through basic training or through recognition of acquired rights. The effectiveness of periodic training was assessed through a comparative analysis of pre- and post-test results during a single cycle of five thematic seminars, with each test containing 20 questions with four possible answers.

The analysis demonstrated a statistically significant improvement in knowledge across all examined

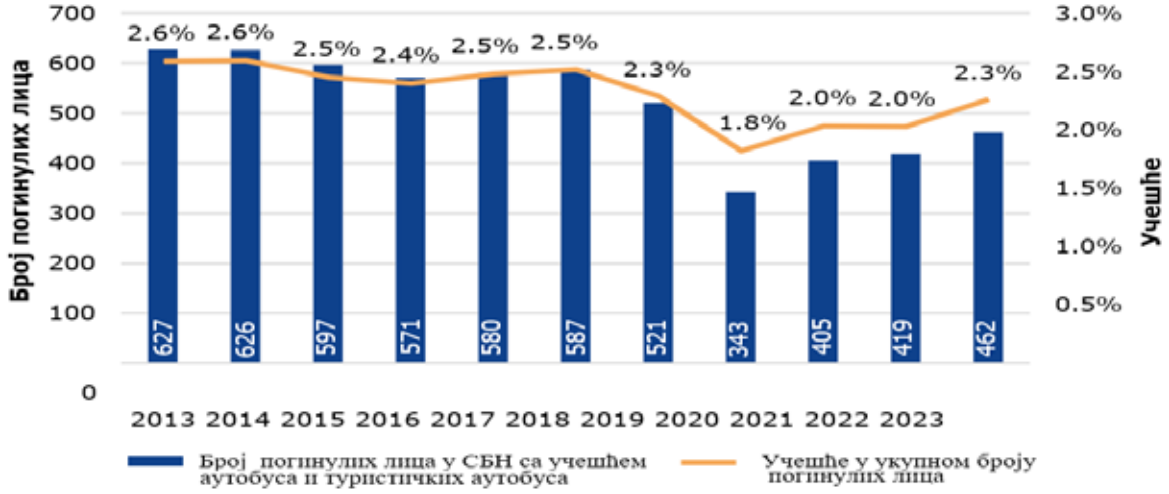

Figure 2. Annual Number of Fatalities in Accidents Involving Buses and Tourist Buses and Their Share of Total Fatalities in the EU27 (2013–2023).

Source: European Commission, 2025

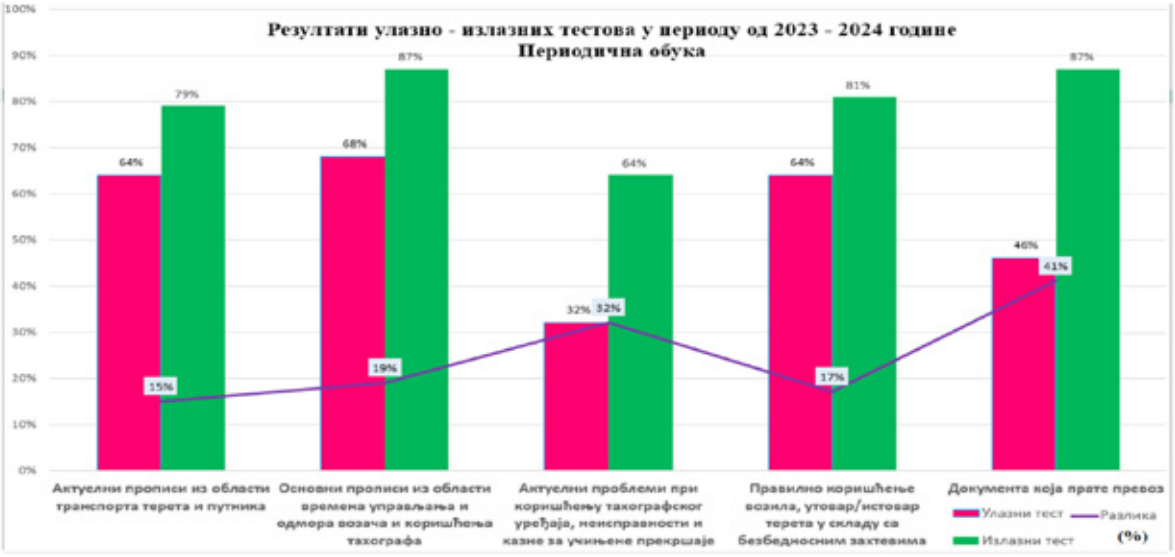

Figure 3. Results of Pre- and Post-Tests (I–V) for the Period 2023–2024.

Source: Zdravković, K. (2025)

areas (see Figure 3), based on data from the co-author's research (Zdravković, 2025). The greatest progress was observed among drivers with higher levels of education and longer work experience, particularly in the field of international transport. A difference was also noted in favor of those who completed basic training compared to drivers with recognized rights, indicating a greater effect of formalized education.

The testing covered the following areas:

I. Current regulations in the field of freight and passenger transport – **636 drivers tested**
II. Basic regulations on drivers' hours of service, rest periods, and use of tachographs – **580 drivers tested**
III. Current issues in using tachograph devices, malfunctions, and penalties for violations – **1,163 drivers tested**
IV. Proper vehicle operation, loading/unloading of cargo in accordance with safety requirements – **1,015 drivers tested**
V. Transport-related documentation – **799 drivers tested**

The best results were achieved in the areas of driving hours and tachograph usage (68%), as well as in regulations related to transport and loading/unloading procedures (64%). The weakest results (32%) were observed in the practical application of tachographs and error identification, indicating the need to improve the

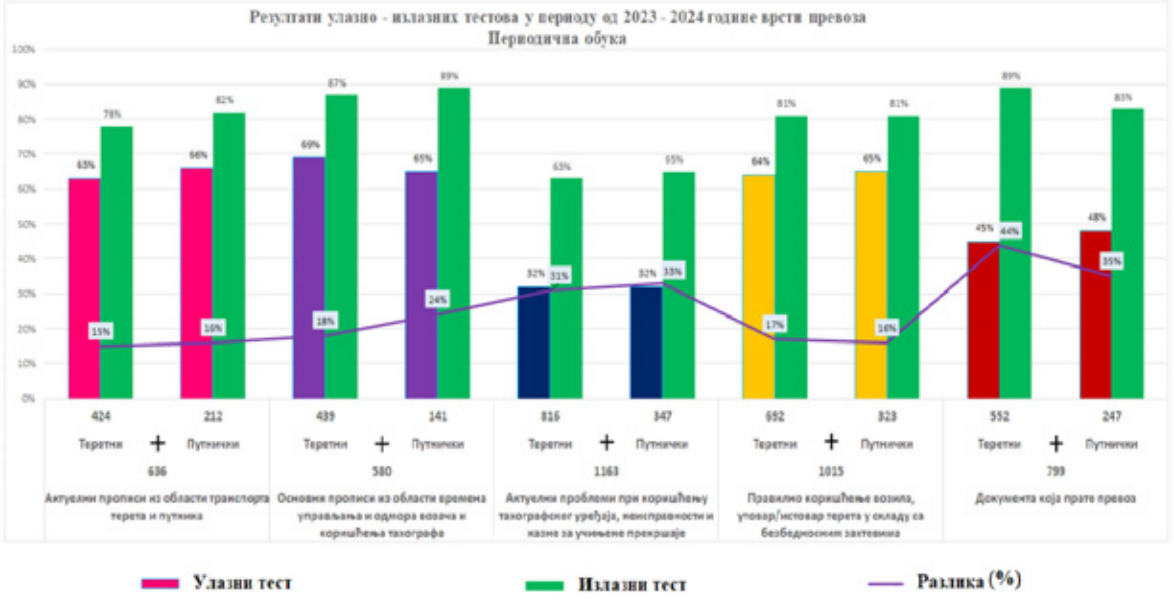

Figure 4. Results of Pre- and Post-Tests (I–V) for the Period 2023–2024, Showing Drivers Qualified for Freight and Passenger Transport.

Source: Zdravković, K. (2025)

content and methodology of training in this segment. Analysis of pre and post test results showed that the largest difference (41%) occurred in the area of transport-related documentation, highlighting the high effectiveness of the training process in this segment.

According to Figure 4, overall pre and post test results did not show statistically significant differences between freight and passenger transport drivers; however, specific differences were noted in thematic areas. The most pronounced difference was observed in the documentation segment, where passenger transport drivers had slightly better initial results (48%) compared to freight transport drivers (45%),which is associated with more frequendocumentation checks in public and international passenger transport.

However, freight transport drivers showed greater progress during the training, achieving a final score of 89% compared to 83% for passenger transport drivers. The difference between pre- and post-test results was 44% for freight transport and 35% for passenger transport, confirming the high effectiveness of the training for freight drivers, particularly in activating previously acquired practical knowledge (e.g., waybills, customs documentation).

In the area of regulations on driving hours and tachograph use, freight transport drivers had slightly better initial results (69% vs. 65%), which can be explained by stricter controls in international transport. However, passenger transport drivers demonstrated greater progress after training (24% vs. 18%), finishing with an average score of 89% compared to 87% for freight drivers.

These results indicate that the work environment significantly influences training outcomes, particularly in public passenger transport, where safety and compliance with regulations are directly linked to service quality.

Based on the analysis of pre- and post-test results and outcomes achieved during the seminars of periodic training for professional drivers, an evaluation of the quality of the training process and instructor performance was conducted. Instructor ratings, provided by participants at the end of the training (on a scale of 1 to 5, where "1" indicates complete dissatisfaction and "5" complete satisfaction), are presented in Figure 5.

The results show that instructors received exceptionally high average ratings, regardless of participants' initial knowledge level and achieved outcomes. For seminars with the lowest pre- and post-test results (Seminar III – Current Issues in Tachograph Usage), the average rating was 4.85, while for seminars with the highest progress (Seminar V – Transport-Related Documentation), the average rating was 4.95.

These findings indicate that participants' perception of the quality of the training process is not directly linked to objective test results; rather, participants generally rate instructors highly, even in cases where knowledge outcomes were relatively modest.

Analysis of evaluation data from Figures 6 and 7 shows a consistently high level of participant satisfaction across all parameters. The only notable difference was observed in the segment related to the novelty of training content: in response to the question, "The material we studied was new to me," Seminar III received an average rating of 4.58, while Seminar V received 4.73. This suggests that participants in Seminar III were somewhat more familiar with the training topics prior to attending, which may have influenced the slightly lower effectiveness in acquiring new knowledge.

Overall results indicate that the high level of instructor satisfaction (average above 4.8) reflects the good acceptance of the training process, regardless of the actual test results. This demonstrates the instructors' strong pedagogical skills and their ability to adapt the training to participants' needs.However, a mismatch was observed between subjective perception and objective results in seminars with lower test scores, where instructors still received very high ratings. This suggests that participant evaluations do not always provide a reliable indicator of the actual level of knowledge acquired.Therefore, it

Figure 5. Instructor Ratings at Periodic Training Seminars for the Period 2023–2024.

Source: Zdravković, K. (2025)

Figure 6. Evaluation of the Periodic Training Seminar on: Current Issues in Tachograph Usage, Malfunctions, and Penalties for Violations.

Source: Zdravković, K. (2025)

is recommended to use combined criteria, i.e., applying knowledge tests alongside participant evaluations, in order to obtain a more complete picture of the effectiveness of the training process.

It is particularly important to note the influence of prior knowledge on the evaluation of training, where ratings for **new material** were slightly lower (4.58) in Seminar III. This confirms that participants with greater prior knowledge tend to evaluate the training more critically and generally show smaller improvements in post-test results (31% for freight drivers and 33% for passenger drivers), compared to Seminar V, where the rating for **new material** was 4.73, and the difference in pre and post test scores was 44% for freight drivers and 33% for passenger drivers.

The practical implications of these findings indicate the need to introduce more diverse teaching methods and to adapt content to different groups of participants according to their level of prior knowledge. Such an approach can establish a better balance between subjective evaluations and objective results, while regular analysis of evaluation and testing data allows for continuous improvement of the training process and targeted focus on areas with the greatest gap between perception and actual knowledge gains.

Regarding the implementation of basic and additional training conducted by authorized training centers, followed by professional examinations and analysis of available data by the Traffic Safety Agency, indicators of achieved training quality were obtained. These indicators are based on projected quality requirements, specifically the criteria for passing the theoretical part of the professional examination (Table 2).

According to the applicable criteria, in order for a driver to successfully pass the professional exam, it is necessary to achieve at least 75% of the total number of points (that is, 75 out of 100 points).Within the scope of this seminar paper, the period from 15 June 2020, when

Figure 7. Evaluation of the Periodic Training Seminar on: Transport-Related Documentation.

Source: Zdravković, K. (2025)

Table 2. Number of Drivers in Basic and Additional Training and Examinations in the Republic of Serbia

Year	Number of Drivers who completed 140-hour training – Freight		Number of Drivers who completed 35-hour training–Passenger	
	Attended the Examination	Passed the Examination	Attended the Examination	Passed the Examination
Year 2020	88	81 (92%)	96	85 (88%)
Year 2021	264	206 (78%)	250	194 (78%)
Year 2022	321	279 (87%)	239	194 (81%)
Year 2023	514	452 (88%)	301	244 (81%)
Year 2024	1.093	914 (84%)	413	333 (81%)
Total	2.280	1.932 (85%)	1.299	1.050 (81%)

Source: Zdravković, K. (2025)

the Serbian Road Safety Agency began implementing the training and examination program, until 15 December 2024 was analyzed. This timeframe represents the period for which relevant ABS data on conducted training programs and examinations were available.The results achieved during the observed period confirmed the projected quality of the training system, given that the pass rate was defined in accordance with the requirements and structure of the professional exam. Specifically, a high percentage of successfully passed exams was recorded:

- for the **basic accelerated training program** of 140 instructional hours, a total of 2,280 drivers took the exam, of whom 1,932 passed successfully, resulting in **a pass rate of 85%.**
- For the **additional training program** of 35 instructional hours, 1,299 drivers took the exam, and 1,050 passed, which corresponds to a **pass rate of 81%.**

Following the amendments to the legal framework and the abolishment of mandatory training (March 2025), the Serbian Road Traffic Safety Agency continued to administer professional examinations for drivers who had completed the initial or periodic qualification training. In the period January–May 2025, the results were as follows:

- After completing the **140-hour training for the transport of goods**, 648 drivers took the exam, 503 of whom passed, resulting in a **78% pass rate**.
- After completing the **35-hour training for the transport of passengers**, 130 drivers took the exam, 106 of whom passed, which corresponds to **a pass rate of 81%.**

When compared to the results from the previous period (2020–2024), a **slight decrease in the pass rate** can be observed among drivers obtaining the qualification for goods transport (from 85% down to 78%), while the success rate among drivers qualifying for passenger transport remained stable at approximately 81% (Table 3).

Following the adoption of legislative amendments, according to which attending training was no longer mandatory for individuals over 21 years of age (for goods transport) and 24 years of age (for passenger transport), the Road Traffic Safety Agency organized exams for this category of drivers.

In the period from May to September 2025, the results showed a significant decline in the pass rate compared to previous periods in which the trainings were mandatory.

For the **initial qualification for freight transport**, 390 drivers took the exam, of whom 177 passed successfully, which represents only **45% pass rate**. This result indicates a drastic decline in success compared to previous periods, when the pass rate exceeded 75%.On the other hand, only one candidate took the exam for acquiring the **additional qualification for freight transport** during this period, and the candidate passed successfully. However, due to the extremely small sample size, this result is not statistically relevant and was not considered in further analysis (Table 4).

In addition to the freight transport exams, during the same period, exams were also conducted for obtaining initial and additional qualifications for passenger transport.

For the initial qualification in passenger transport, 139 drivers took the exam, of which 79 passed successfully, representing a pass rate of 57%.

Table 3. Number of Drivers in Basic and Additional Training and Examination Procedures in the Republic of Serbia

Year	Number of Drivers who completed 140-hour training – Freight		Number of Drivers who completed 35-hour training–Passenger	
	Attended the Examination	Passed the Examination	Attended the Examination	Passed the Examination
01.01-21.05.2025.	648	503 (78%)	130	106 (81%)
Total	648	503 (78%)	130	106 (81%)

Source: Zdravković, K. (2025)

Table 4. Number of drivers taking qualification exams for Freight Transport in the Republic of Serbia

Year	Number of drivers taking the exam for the initial qualification – freight transport		Number of drivers taking the exam for the additional qualification – freight transport	
	Attended the Examination	Passed the Examination	Attended the Examination	Passed the Examination
22.05-12.09.2025.	390	177 (45%)	1	1 (100%)
Total	390	177 (45%)	1	1 (100%)

Source: Zdravković, K. (2025)

Table 5. Number of drivers taking exams for obtaining passenger transport qualifications in the Republic of Serbia

Year	Number of drivers taking the initial qualification exam – passenger transport		Number of drivers taking the additional qualification exam – passenger transport	
	Attended the Examination	Passed the Examination	Attended the Examination	Passed the Examination
22.05-12.09.2025.	139	79 (57%)	54	33 (61%)
Total	139	79 (57%)	54	33 (61%)

Source: Zdravković, K. (2025)

For the additional qualification in passenger transport, 54 drivers took the exam, of which 33 passed successfully, representing a pass rate of 61% (Table 5).

DISCUSSION

The research results, together with the analysis of the regulatory framework, statistical indicators, and the evaluation of professional driver training in the Republic of Serbia, highlight several important findings relevant to improving road traffic safety and the training system.

Impact of alignment with European Standards

The national system for training professional drivers in Serbia is largely aligned with Directive 2003/59/EC, which regulates initial, accelerated, and periodic training. This alignment has contributed to a gradual improvement in drivers' competencies and a reduction in traffic accidents. However, compared to EU countries, progress in Serbia remains slower. Although commercial vehicles account for about 26% of traffic accidents, they are responsible for a disproportionately higher share of fatal outcomes (27%), emphasizing the need for continuous education and the protection of vulnerable road users.

Effectiveness of the training process and the role of Instructors

Analysis of the entry–exit tests confirms that periodic training significantly increases drivers' knowledge, particularly in areas such as documentation and tachograph usage. Differences between freight and passenger transport drivers indicate that the work environment and prior knowledge significantly influence learning effectiveness. Instructor evaluations (average ratings above 4.8) confirm high pedagogical quality, yet a mismatch between subjective evaluation and actual test results was observed. This highlights the need for a combined assessment approach, integrating objective tests with participant evaluations to obtain a more complete picture of training effectiveness.

Consequences of removing mandatory training

Amendments in 2025, which removed mandatory training for drivers over 21 (freight) and 24 years (passenger), led to a sharp decline in exam pass rates: from 85% to 45% for freight drivers and from 81% to 61% for passenger drivers. These data clearly indicate that mandatory training is a key factor in maintaining professional competencies and road safety. Eliminating regular education reduces knowledge standardization, quality control, and increases accident risk.

European directives, particularly 2022/2561/EC, emphasize the importance of digitalization of training, flexible learning methods, assessment of psychophysical abilities, and continuous professional development of instructors. Based on the comparative analysis, the following recommendations are suggested:

1. Reinstatement of Mandatory Training for All Categories of Professional Drivers
2. Establishment of an Integrated Training Model that enables drivers of freight vehicles and buses to acquire the appropriate qualifications through a unified training process.
3. Introduction of a Risk Perception Test for all commercial vehicle drivers.
4. Stepwise Acquisition of Professional Driving Licenses under the supervision of experienced drivers.
5. Integration of Digital Teaching Tools and Simulators to enhance the practical effectiveness of training.
6. Continuous Monitoring and Analysis of Test Results in combination with subjective trainee evaluations.
7. Professional Development of Instructors through regular training and certification programs.

8. Application of EU Standards for Driver Assessment and Certification to reduce accident rates and improve road safety.
9. Strengthening the Capacity of State Institutions for more effective oversight of training centers.
10. Introduction of a Co-Financing Model for Initial Training involving candidates, employers, and local authorities.

Concluding remarks

Overall, these conclusions and recommendations indicate that improving the professional driver training system is a prerequisite for developing competent, responsible, and safe drivers. The integration of digital technologies, continuous monitoring of knowledge, and the professional development of instructors will enable long-term enhancement of traffic safety culture and a reduction in road accidents in Serbia, in line with European standards and the "Vision Zero" concept.

CONCLUSION

The research confirms that systematic and standardized training plays a decisive role in developing professional driver competencies and improving road traffic safety.

Based on the conducted study, the authors have identified several key findings that illustrate the main conclusions and recommendations regarding the topic:

1. Serbia has largely aligned its system with Directive 2003/59/EC, but further approximation to European practices is needed.
2. Periodic training significantly improves knowledge and operational skills, particularly in the areas of documentation and tachograph use.
3. The abolition of mandatory training in 2025 led to a decline in pass rates and a reduction in knowledge quality, confirming the necessity of compulsory training.
4. There is a need to introduce digital learning methods, driving simulators, and continuous professional development for instructors.
5. Continuous analysis of testing results and participant evaluations is essential for monitoring training quality and effectiveness.
6. An integrated system of training and examinations for obtaining professional driver licenses and initial qualifications should be established.
7. A subsidized financial model should be implemented to ensure the sustainability and accessibility of training for young drivers aiming to achieve professional status.

Overall, the development of an integrated and standardized training system, aligned with European directives, provides the foundation for building a safe, professional, and sustainable transport system in the Republic of Serbia, taking into account the best practices in neighboring countries and the EU2

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