

CAUSES OF ACCIDENTS AND CRITERIA OF CONTROL ON THE ROADS

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ABSTRACT

In the article, which has a nature of a review, the views of domestic and foreign researchers on the problems of road safety on roads, the causes of accidents and ways to prevent them are analyzed.

Keywords: road safety, passenger motor transport, accident rate, diagnostics, control criteria, prevention of violations, human factor.

Background. Many researchers deal with the problems of road safety. But quite often they are considered in the usual foreshortening, avoiding sharp turns and direct assessments. Often, adopting new regulations to ensure the safety of passenger traffic, it is not indicated which technology can provide comfortable, with minimal risk transportation of passengers. Primarily requirements are imposed on the driver and routes, while safety during transportation of the population is not limited to this. And in our review of publications, we just want to pay attention to this topic.

Objective. The objective of the authors is to causes of accidents and criteria of control on the roads, which are considered in a number of scientific publications.

Methods. The authors use general scientific methods, comparative analysis, evaluation approach.

Results. In the article «Methodology of formation of diagnostic criteria for evaluation of safety of motor transport public service» M. Z. Erknepeshyan, V. A. Zelikov, K. A. Yakovlev and V. A. Ivannikov [1] note that existing methods of information support of road safety are ineffective for prevention of accidents, primarily due to the lack of a system of true indicators of accident rate assessment on public passenger transport. The list of more «true» diagnostic indicators, according to these authors, is as follows:

- monitoring of technical condition of vehicles before starting work and on the line;
- professional selection of drivers;
- providing drivers with information regarding traffic conditions on the route;
- training of drivers on the routes (internship);
- annual advanced training of drivers for road safety;
- medical examination of the driver for obtaining a driving license;
- pre-trip and post-trip medical examination of drivers;
- control of drivers on the line.

But at the same time, the authors do not specify how the integral indicator obtained (the sum of the estimates for the 5-point system) corresponds to the readiness of the subjects of road transport activities to prevent accidents on the roads. The application of this technique is possible only to compare the performance of one trucking enterprise with another. And it is not entirely correct to reduce all the indicators to an integral estimate. It is better to separately identify the characteristics that clearly affect the safety of traffic. In addition, in our opinion, it is also not very correct to use the parameters specified in the article. Almost all of them are fixed at the legislative level and are obligatory for execution.

According to G. Boyko, S. Tuirina and V. Fedotov [2], the main cause of the traffic safety violation

Attempts are made to trace the main trends of scientific research in this field, including those that concern diagnostic criteria and indicators for assessing safety of passenger vehicles, as well as the human factor in all its contemporary manifestations.

involving passenger transport is massive attraction of unskilled drivers for work in small capacity buses. They do not understand enough about the specifics of their technical operation, try to allow as many passengers as possible in the passenger compartment, not taking into account that this creates a danger not only for people in the car, but also for the traffic situation as a whole. Low qualification of drivers of minibuses, as well as their low level of legal awareness and lack of understanding of the essence of road accidents (crashes) clearly contribute to the occurrence of accidents [2, p. 28].

It is difficult not to agree with such a view. These buses are very popular among the population, when compared with more spacious buses, many positive aspects can be revealed in them – they are more mobile and faster, the difference in payment for travel is minimal. And for carriers on routes where during the day there are mainly small passenger traffic, it makes it possible to completely fill the cabin and reduce the cost of driving. But the quality and safety of transport by minibuses really leave much to be desired. Drivers of low-capacity buses often violate the traffic rules: they arrange races with drivers of other passenger cars, jump at the intersections to a yellow traffic light signal, often wrongly change the lane, creating dangerous traffic situations.

According to G. I. Klinkovshstein, safety in the sphere of passenger motor transport of general use is influenced by external and internal problems [3]. External are characterized by a large increase in urban transport traffic, an increasing level of motorization and a significant lag in the last years of the pace of development of road networks. As a consequence, the accident rate itself and the risk of road accidents are high.

Internal problems of traffic safety, the same researcher believes, are associated with the insufficient development of the transport infrastructure: low level of development of the street-road network (SRN), inefficiency of the existing urban route networks, lack of decent organizational, technological and technical solutions to protect pedestrians on the streets and users of passenger motor transport. But internal problems are not limited to this. They are also manifested in the low technical characteristics of buses in terms of active, passive and post-accident safety, inadequate driver training, and shortcomings in the organization of the transportation process.

This is influenced, first of all, by the ill-conceived policy both in the sphere of motor transport and in the field of small business support. With all the initially positive aspects of the simplified tax and tax policy proposed by the state, which led to the fragmentation of most of the country's motor transport enterprises, it does not take into account the significant losses of



the state from reducing the sustainability of public road transport and reducing the effectiveness of measures to prevent accidents from small business entities. Small enterprises do not have their own production and technical base, are limited in the ability to replace a worn-out bus fleet and conduct professional selection and advanced training of drivers.

In addition to this, in our opinion, the weak responsibility of the regions and local self-government regarding the disproportion of mass motorization and development of the street-road network can be traced. In Russia, more than 57 million vehicles have been registered. That makes about 390 cars/1000 inhabitants, while the share of SRN is 10 % of the territory of cities. For comparison, in Europe, this figure can reach 25 %, and in North America – 35 %. It is necessary to bring this figure to at least 20 % to ensure, if not comfortable, then safe conditions for traffic.

Italian scientists S. Cafiso, A. Graziano and G. Pappalardo [4] from the University of Catania believe that the safety of passenger transport on the roads is given insufficient attention due to the low percentage of accidents involving buses and the assumption that public transport increases road safety for account for reducing car traffic. University specialists believe this is incorrect. They cite statistics that all accidents account for 10 % of buses. But at the same time they note that public transport has an important social significance, so the accident should not only be reduced to a minimum, but also to exclude the very possibility of their occurrence.

In their research, Cafiso and his colleagues found that the professional skills of the driver have the greatest impact on the safety of passenger traffic (the greatest danger occurs during braking and automatic opening of doors), materials and the internal architecture of buses. The most frequent causes of road accidents are inattention and fatigue of drivers. One way to strengthen these positions is the widespread introduction in the future of intelligent transportation systems in passenger transportation, which will increase the likelihood of overcoming many of the listed problems.

J. Zaranka, R. Peselijnas and D. Matyozus from the Vilnius Gediminas Technical University in the article «Analysis of the influence of fatigue on passenger transport drivers' performance capacity» confirm that driver fatigue remains a rather frequent cause of crashes and accidents. Up to 75 % of accidents occur due to his fault. And the reliability of the driver can

worsen due to the predisposition to risk, emotional instability, aggressiveness, wrong perception of the scale of values [5].

Based on the results of their research, the authors suggest a technique for professional selection of drivers. They note that their important professional traits should include emotional stability, resistance to obstacles and monotony of the road, the ability to predict possible emergencies, mindfulness and good memory. They should be paid attention to after a long break in the driver's work, when the professional skills lose their automatism. It is recommended that drivers be tested on a regular basis with the help of special exercises simulating various emergency situations.

Such a methodology is necessary, but at the same time in the proposed version of Vilnius colleagues there are no exact criteria and their quantitative measurement. One can only talk about whether the potential driver is coping with tasks and at what speed he is performing them, i.e. we are talking about comparative indicators.

When considering the opinions of various scientists about the psychological causes of accidents, it should be noted that most of them emphasize certain unsuitable individual traits of people involved in accidents and in general a significant influence of the human factor on road safety. As a rule, researchers come to a unanimous conclusion: professional selection, based on the results of testing, should be comprehensive and qualitative. The methodology of this choice must take into account a detailed analysis of the characteristics of the activity and social significance of the profession of drivers.

Lingling Yang, Kuanghin Soong, Shaokuan Shen and Yu Huang [6] from the Beijing Transport University in the article «Safety Analysis of Taxi Lane Changing Behavior» consider such an urgent problem for China as the safety of passenger transportation when using a taxi. This issue is no less relevant for Russia, since we also have few regulatory and legal acts concerning this sphere. And those that are available do not sufficiently protect passengers and other road users.

According to the authors' estimates, a low level of wages can «encourage» taxi drivers to sacrifice safety, as they try to maximize revenues by accelerating traffic (revenue source turnover) or risky behavior. Including often do not keep lanes, change lanes, which creates emergency situations on the road.

The same situation, we note, is observed in our country. No one is responsible for quality and safety





of passengers in a taxi. The passenger uses this type of transportation at his own risk.

The team of Romanian researchers in the article «The need to improve transport conditions in the big cities of Romania» [7] believes that the increase in the number of cars contributed to increased traffic, particularly in the morning and evening peak hours. In addition, most cars are second-hand, which also adversely affected the road situation and the environmental situation in the cities. The problem can be solved by public transport, but today the population uses a personal car even for trips on short distances. According to the authors, the quality of service and the speed of passenger transport leave much to be desired, so most residents prefer their own cars. In contrast, there is a search for alternatives – one of the projects provides for passenger transportation using rail buses in Bucharest and other major cities of the country.

This type of transport has many advantages compared to conventional buses: speed, safety, convenience, environmental friendliness. For many cities in Russia, this type of passenger traffic could also be a good alternative to the already familiar for us buses, trolleybuses and the metro.

In Russia, by the way, there are already positive examples of the use of rail buses. And here it would be expedient to bring passengers as close to large passenger-forming enterprises as possible (markets, theaters, supermarkets, etc.). Now the rail version is mainly in demand on suburban routes, but in the city, such a transport would be popular. Using existing railroad access roads and building new ones, it is possible to reduce the burden on public passenger transport and the road.

Conclusions.

From all the above, we can draw the following conclusions:

1. It is necessary to update the regulatory framework in the field of road safety due to the fact that existing laws and regulations have significant gaps

requiring an obligatory reaction of society and the state.

2. An initial set of measures to improve traffic management should be identified to reduce the number of vehicles on city streets and increase the capacity of the road network.

3. It is proposed to expand the possibilities for the use of alternative types of public transport with the purpose of unloading and improving traffic safety in the areas of operation of traditional modes of moving passengers in the city.

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