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THE IMPACT OF TRAFFIC CONGESTION ON HUMAN PSYCHOLOGY

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Abstract: This article provides a scientific analysis of the impact of traffic congestion in urban areas on human psychological well-being and daily functioning. The study investigates key psychological factors that emerge during congestion—such as stress, irritability, fatigue, and reduced attention span—and evaluates their long-term implications for human health. Furthermore, the article examines how traffic congestion affects work productivity, emotional stability, and social interactions. Recommendations are proposed regarding psychological coping strategies aimed at mitigating the negative effects of congestion, as well as the role and significance of modern transport management systems in reducing traffic-related stress. The research findings offer valuable practical insights for enhancing urban transport system development and improving the overall psychological well-being of the population.

Keywords: Traffic congestion, transportation, automobile, pedestrians, oad traffic, modern transport, driver.

The lower layers of the atmosphere are polluted with dust particles consisting of micro-particles of asphalt concrete, used rubber, abrasive materials, lead, and other substances. Some of these components possess carcinogenic and mutagenic effects. Such pollution negatively affects another category of road users – pedestrians. The highest concentration of harmful substances accumulates in the layer of air located 1 meter above the ground surface.

The negative consequences affect not only humans but also animals. Noise generated from highway roads is considered an adverse factor that leads to the deterioration of environmental indicators in cities. On highways where more than two thousand vehicles can travel per hour, the noise level exceeds 80 dB. To reduce this indicator, noise-barrier structures are installed and green plants are cultivated along the road [1]..

According to information presented in the Psychological Science journal, traffic congestion on roads negatively affects a person's psychological state. Such conditions have a serious impact on human health and, over time, may lead to the development of severe illnesses. This conclusion is based on research conducted by scientists from the University of California.

In the 1990s, scientists conducted surveys involving 800 participants aged between 25 and 74. All respondents answered questions related to their health conditions — such as anxiety, restlessness, lack of strength and energy, and how frequently these conditions occurred. In the 2000s, scientists conducted another similar survey.

According to the research results, human health is affected not so much by major stress events, but rather by minor negative influences (such as a minor traffic accident or traffic congestion). Scientists have proven that a person’s negative reactions to events happening around them gradually accumulate and may eventually lead to serious psychological disorders.

It is known that traffic congestion in large cities tends to last long and cover long distances; therefore, drivers in Russia often display aggressive behavior toward one another [4]. Researchers emphasize that frequently being in traffic congestion can seriously harm human health. Studies conducted by Australian scientists show that after spending approximately one hour in traffic, a person’s risk of experiencing a heart attack (myocardial infarction) increases. The main reasons for this are identified as a sharp rise in heart attack cases caused by exhaust gases, noise, and stress factors.

Remaining in traffic congestion for a long time causes excessive muscle strain in the driver, which negatively affects their physiological condition and overall work performance. As a result of such strain, the level of fatigue increases, and the driver’s attention and reaction speed decrease. In addition, a driver’s poor health condition or technical malfunction of the vehicle poses a direct threat to road traffic safety and may also negatively affect the movement of other road users.

Therefore, it is important to regularly monitor the vehicle’s technical condition, ensure the full functioning of all its systems and components, and maintain the driver’s psychophysiological state in a stable condition.

Such preventive measures not only reduce stress but also contribute to improving overall road traffic safety [2].

According to E.M. Lobanov [3], the influence of human psychophysiological qualities on road traffic safety has been systematically summarized. Research results show that the psychophysiological characteristics of a driver's body change under the influence of external factors, particularly the complexity of road and transport conditions, the level of congestion, noise, lighting, temperature, and traffic intensity. These changes directly affect the driver's attention level, reaction speed, decision-making quality, and resistance to stress.

Taking into account the role and significance of the human factor in road traffic safety, Lobanov emphasizes the necessity of shaping traffic conditions in accordance with the psychophysiological capabilities of humans. This approach is essential for ensuring the stability of the transport process, reducing errors in driver activity, and preventing road traffic accidents.

Thus, psychophysiological characteristics are regarded as important indicators for assessing traffic conditions and determining the causes of road traffic accidents. Ignoring these factors leads to a decrease in traffic safety levels, an increase in operational errors, and, ultimately, the emergence of traffic congestion.

A person's psychological reactions and decision-making in evaluating a situation are not always accurate or objective. This process is directly influenced by an individual's physiological condition, age, driving experience, ability to concentrate, and resistance to stress. Human visual and auditory organs respond differently to external environmental influences, meaning that the same road-and-transport situation may be interpreted differently by different drivers. According to G. Knoflacher [3], a person is unable to fully and correctly perceive the real characteristics of a traffic flow—namely its intensity, safety level, and dynamics [49]. This leads to incorrect actions, delayed reactions, and the occurrence of dangerous situations.

In modern transport systems, traffic congestion is one of the most significant factors negatively affecting human mental and physical health. Prolonged congestion results in fatigue, irritability, decreased attention, increased heart rate, and elevated blood pressure. Additionally,

excessive delays on the road negatively influence a person's work performance, educational process, or social relationships [5,6].

Even when a vehicle is stationary in traffic congestion, fuel consumption increases because the engine continues to run, exhaust gases are released into the atmosphere, and the vehicle's components wear out more quickly. This process also harms ecological balance and leads to a deterioration in air quality. As a result, stress, fatigue, and nervous tension among drivers and other road users intensify.

Thus, traffic congestion not only reduces the efficiency of traffic flow but also negatively affects a person's psychophysiological condition, health, work productivity, and ecological stability. Therefore, in managing road traffic, it is of significant scientific and practical importance to thoroughly study the psychophysiological aspects of the human factor, as well as to improve organizational and planning measures aimed at reducing congestion.

Traffic congestion is recognized in modern urban transport systems not only as a factor that decreases traffic efficiency but also as an important factor directly affecting drivers' psychological state. Research shows that prolonged periods spent in congestion lead to emotional instability, impatience, aggressive behavior, and increased stress in drivers. This is primarily due to the duration of the congestion, the lack of clear information about its causes, and the inability to fully perceive the overall traffic situation.

This psychological pressure reduces the driver's attention, slows down decision-making, and decreases reaction accuracy. As a result, these conditions increase the risk of road traffic accidents and negatively affect overall traffic safety. Therefore, in managing road traffic, it is of significant scientific and practical importance to implement comprehensive measures aimed at stabilizing the driver's psychophysiological state, in particular by improving systems that provide drivers with accurate and timely information about traffic conditions.

In modern conditions, people's psychological stability and stress tolerance have significantly decreased. Alongside social, economic, and ecological factors, the complexities of the transport system place additional pressure on human mental health. Therefore, the emotional

state of a driver is critically important from the perspective of road traffic safety.

A highly nervous or stressed driver loses the ability to make adequate decisions, and their level of attention and concentration decreases, which increases the risk of road traffic accidents. Consequently, a driver's negative emotional state should not affect their driving style or overall traffic behavior.

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