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Analysis of Road Accidents in the Prevention of Road Safety

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Abstract: As in all sectors of the economy of Uzbekistan, major changes are being implemented in the road transport sector. Along with the increase in real incomes of the population, major projects have been implemented in the automotive industry. The production of various types of cars has been expanded, and new improved models have been launched. The architecture of cities has developed, and highways and city streets have been renovated. Such changes have also had a positive impact on ensuring traffic safety. Despite this, ensuring traffic safety on highways and city streets and effective management of this area still remains one of the pressing problems. Problems in the field of ensuring traffic safety have been raised to the state level in our country. On February 11, 2022, a videoconference meeting was held under the chairmanship of the President, at which problems in ensuring traffic safety and their solutions were considered.

Key words: road, infrastructure, traffic, safety, car, pedestrian, person, motor vehicle.

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INTRODUCTION

Road safety has become an increasingly urgent issue worldwide, particularly in developing countries like Uzbekistan, where significant advancements in transportation infrastructure are being made. As the country's road network improves and the number of vehicles on the roads continues to rise, road traffic accidents and their consequences have also become a growing concern. In recent years, despite the expansion and modernization of the road system, ensuring road safety has remained a critical issue, prompting governmental efforts to address it. On February 11, 2022, a videoconference chaired by the President of Uzbekistan focused on the challenges of ensuring traffic safety and explored potential solutions. This paper aims to provide a comprehensive analysis of road traffic accidents and to propose effective measures for enhancing road safety in Uzbekistan.

The analysis of road accidents is essential for identifying the causes and developing strategies to mitigate the risks associated with road transport. Road traffic accidents occur due to multiple factors, including human error, infrastructure deficiencies, and vehicle-related issues. Previous studies have highlighted several recurring causes of accidents, such as speeding, driving under the

influence of alcohol, distracted driving, and poor weather conditions. However, there is still a lack of in-depth research that explores the interaction between these factors and their specific impact on the road safety situation in Uzbekistan. This study seeks to bridge this knowledge gap by focusing on the unique factors that contribute to road accidents in the region and offering tailored solutions to improve traffic safety.

The major concepts central to this study include road traffic accidents, traffic safety, and risk management. These concepts are analyzed in light of existing theories related to human behavior, road infrastructure, and vehicle safety. Several key theories inform the study, including the Human Factors Theory, which suggests that human error is a significant cause of traffic accidents, and the Systems Theory, which emphasizes the interconnectedness of road infrastructure, vehicle safety, and driver behavior. Understanding these theoretical frameworks provides insight into the complex nature of traffic accidents and informs the development of more effective prevention strategies.

To analyze the problem, this study employs both qualitative and quantitative research methods. Accident data will be examined to identify accident-prone areas, recurrent accident types, and the correlation between specific factors, such as weather conditions and driver behavior. A comprehensive program to improve road safety will be developed based on the findings. This program will address not only driver training and law enforcement but also the improvement of road infrastructure and the promotion of safer vehicle designs. The study aims to provide actionable recommendations for government authorities, transportation companies, and road users to work collaboratively toward reducing traffic-related fatalities and injuries.

Methodology; The methodology of this study focuses on a comprehensive approach to analyzing road traffic accidents and developing effective strategies for improving road safety in Uzbekistan. The research is driven by both qualitative and quantitative methods. First, accident data will be systematically collected from various sources, including police reports, traffic databases, and public records, to identify patterns in road accidents. The study will examine key variables such as accident frequency, accident types, weather conditions, and driver behavior. Statistical tools will be used to analyze these variables, allowing for the identification of high-risk areas and recurring factors contributing to accidents. Additionally, the research will focus on human behavior factors, such as speeding, driving under the influence, driver fatigue, and distractions, which are significant contributors to accidents in Uzbekistan.

To further understand these factors, the study will incorporate a review of existing traffic safety regulations and enforcement practices in Uzbekistan. It will assess the effectiveness of current road safety measures, including law enforcement, traffic signal systems, and road design, in preventing accidents. Interviews and surveys with road users, including drivers, pedestrians, and local authorities, will provide insights into public awareness of traffic rules and safety practices. Moreover, the research will explore the impact of road infrastructure on accident rates, considering the condition of roads, signage, and safety features. Finally, the methodology will include the development of a comprehensive road safety improvement program based on the data analysis, which will focus on education, infrastructure enhancement, and law enforcement to reduce road accidents and fatalities. This program will be evaluated based on its feasibility and potential to create a safer road environment for all users.

Analysis and Results; Road traffic accident analysis is important for effectively solving these problems and increasing safety. The purpose of the accident analysis is to focus on the following main areas:

Identifying the causes of accidents and developing measures to eliminate them: One of the important aspects of analyzing accidents is identifying their root causes. For example, it is

necessary to identify factors such as speeding, failure to comply with traffic rules, or defective vehicles, and develop specific measures to eliminate them.

Identifying accident-prone areas: Road accidents can occur in many areas. It is necessary to identify areas with a high probability of accident occurrence and develop special measures to increase safety in these areas. Based on this information, road infrastructure can be improved, speed reductions in designated areas, and other safety measures can be taken.

Identifying the causes of multiple road traffic accidents: In some cases, the same type of accidents occur frequently. Analyzing such cases and identifying the causes of similar accidents is important for their elimination. For example, frequent collisions may occur on the same section of road, which indicates the presence of a specific problem.

Develop a comprehensive program to improve road safety: It is necessary to develop a comprehensive program to improve road safety through a systematic analysis of road accidents. This program includes driver training, improving road infrastructure, making vehicles safer, and a number of other measures. It is necessary to strengthen cooperation between companies and government agencies and apply a systematic approach to improving safety.

By conducting a systematic approach to accident analysis, identifying its main factors and developing effective countermeasures, economic losses can be reduced. This systematic analysis also leads to the development of specific measures aimed at improving safety.

The data obtained as a result of the analyses are used for the following purposes:

1. Predicting the state of the crash.
2. Determine the distribution of accidents that occurred by their types, severity, and other indicators.
3. To determine the relationship between indicators characterizing road conditions and the occurrence of road accidents.
4. To determine the impact of road conditions on accidents involving vehicles of various designs.
5. To determine the relationship between social factors (age, qualifications, work experience, etc.) and the number of drivers in the period.
6. Determine which articles of the traffic rules and other regulatory documents developed for traffic safety are causing the accident.
7. Development, scientific substantiation and evaluation of measures aimed at eliminating traffic accidents and increasing traffic safety.

Such measures include:
daily, monthly, quarterly, annual and multi-year plans aimed at eliminating traffic accidents, amendments to regulatory documents governing the design and use of vehicles, improvement of road requirements and driver training programs, etc.

If the issue of traffic safety and its problems and the formation of a culture of road users are not resolved, the number of road accidents and fatalities of various degrees may increase. Due to the insufficient establishment of effective control aimed at ensuring the safety of passengers on the roads, more than 16 million traffic violations were recorded in 2023. Of these figures, 13 million were gross violations, about 42 thousand vehicles were driven while intoxicated, and more than 300 thousand pedestrian violations occurred. As a result, 9839 road accidents were committed, of which 9209 injured citizens, and 2282 died. In 2023, 1,794 road traffic accidents involving children were recorded, of which 1,568 were injured and 263 were killed.

Conclusions and suggestions; Ensuring road safety is an activity aimed at preventing the causes of road accidents and reducing their consequences. It is of great importance in the process of regulating traffic and organizing traffic. Regulation is carried out mainly through traffic lights, traffic signals, road signs and road marking lines. These tools create the opportunity for road users to move safely and orderly. Traffic lights and their signals ensure that drivers and pedestrians follow traffic rules, while road signs provide directions, speed limits and other important information.

Road users are drivers, pedestrians and passengers. The main document for them is the traffic rules, the requirements of which must be strictly observed by all road users. A pedestrian is a person who is on the road outside the vehicle and does not work on it. Pedestrians are also people moving in wheelchairs, driving a bicycle without a motor (moped, motorcycle), carrying a sled (sled, stroller).

A driver is a person who drives a vehicle.

The main mistakes made by drivers that lead to car accidents are:

1.Driving a vehicle while intoxicated.

In the first place, the most obvious cause of all traffic accidents is driving under the influence of drugs or alcohol. This is why most fatal accidents occur. All drivers know that alcohol impairs concentration and in this case it is better not to drive at all, but some continue to categorically ignore this rule. As a result, people with disabilities.

2. Driver fatigue.

A sleepy or tired driver has impaired concentration and increased reaction time. The behavior of such drivers is almost as unpredictable as driving drunk. Traffic accidents involving sleeping drivers are often flashed in traffic police reports.

3. Speeding up.

is occupied by those who like to drive fast. Speeding is the second most common cause of accidents. Numerous studies have confirmed that the likelihood of getting into an accident increases if a driver drives faster or slower than the average speed. It is noted that when driving fast, the driver gets used to the speed and cannot adequately assess the rapidly changing situation on the road, as a result of which the most terrible accidents occur, leading to the most tragic consequences.

4. The tendency of drivers to be distracted from the road.

In most countries of the world, talking on a cell phone while driving without special devices is prohibited, but some manage not only to talk, but also to write SMS messages. Even a few seconds to switch on the car radio can lead to tragic consequences.

5. Inability to adequately assess weather and road conditions.

Often, even a slight increase in speed or failure to maintain a safe distance on a wet road can lead to a skid and subsequent collision. Timely replacement of tires depending on the time of year saves drivers from many problems on the road.

6. Ignoring seat belts.

The effectiveness of seat belts has been proven over the years of their existence, but many drivers and passengers continue to neglect their use, thereby endangering their lives and health. According to statistics, the use of seat belts reduces the risk of death and serious injury in a frontal collision by 2-2.5 times, in a side collision - by 1.8 times, and in a rollover - by 5 times.

Every year, road accidents affect the lives of countless people, highlighting the need for comprehensive strategies to improve road safety. Whether you are an experienced driver or a pedestrian navigating busy streets, road accidents can happen to anyone. The statistics are staggering - many injuries, fatalities and deaths occur due to accidents that are often preventable. This pressing issue requires a collective effort to implement effective solutions that reduce risks and create a safer road environment for everyone.

From education and law enforcement to technological advancements and public engagement, each solution plays a critical role in addressing different aspects of accident prevention. These strategies are not just theoretical concepts; they have the potential to make a significant impact on the lives of countless road users.

Join us as we explore these solutions, which include a variety of approaches, from educating people about responsible driving to implementing advanced technologies that regulate traffic flow. By understanding and implementing these solutions, together we can reduce accidents and create a road culture that puts safety above all else.

The fundamentals of road safety include various measures aimed at ensuring road safety. According to the degree of impact on traffic safety and accident prevention, these measures are divided into active and passive.

Control and monitoring of events held within the framework of the "Road Safety Awareness Day", as well as coordination of the activities of authorized bodies and institutions, is carried out by the Republican Interdepartmental Commission for the Prevention of Offenses and Combating Crime.

In accordance with the resolution, the program for holding the "Road Safety Awareness Day" was approved.

When walking on the sidewalk: Walk to the right, children should be on the side of the road. If there is a sidewalk close to the road, it is important for parents to hold the child's hand.

Teach sidewalk safety: Teach children to watch carefully for cars leaving the yard, and to only move strollers and sleds along the sidewalk.

When preparing to cross the road: Check the road and only cross where it is safe. Develop your child's observation of the road, keep their eyes focused, and emphasize your actions.

Teaching distance vision: Teach your child to distinguish between oncoming vehicles. Teach them to distinguish between cars that are near and far.

Observing Turns: Look carefully at the vehicles' turn signals and explain them to the child.

Crossing the road: Only cross the road at a crosswalk or intersection. Stop talking when crossing the road, don't run, and don't rush.

Crossing the street with caution: Teach children not to cross the road without checking the road first, because of vehicles or bushes. Explain how to improve road visibility.

Crossing an unregulated intersection: Teach your child to watch carefully for the start of traffic. Explain to your child to cross carefully even when there is no traffic.

Getting in and out of transport: Get out first, in front of the child. Open the door after the car stops. Teach them to be aware of the danger of slamming the transport doors when approaching.

Recommendations for developing street behavior skills:

Crossing Skills: When approaching a road, stop and check the road in both directions.

Calm and confident behavior skills: Try not to be late before leaving the house so that you have time and can carry out your actions calmly.

Self-regulation: Shape your daily behavior under the supervision of your parents.

Ability to anticipate danger: A child should be able to sense danger behind objects that are playing or moving in the street.

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