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# THE ROLE OF INFORMATION AND INTELLIGENT TECHNOLOGIES IN ENSURING ROAD SAFETY

***Ikrom Ovlakulov***

*student of the Department of Road Safety and Engineering,*

*Namangan engineering-construction institute.*
***Murotbek Boydadaev***

*associate professor of the Department of Road Safety and Engineering,*

*Namangan engineering-construction institute.*
*murotboy@mail.ru*

**Annotation:**The article examines the role of intelligent transport technologies (ITT) in improving road safety. It describes methods for collecting and analyzing data, predicting risks, and using video analysis systems and mobile applications. Particular attention is paid to cybersecurity in the transport sector and the prospects for the development of ITT. Examples of successful application of ITT in different countries are considered and ways to further improve these technologies are proposed, including an analysis of the situation on the roads of Uzbekistan and measures to implement ITT.

**Keywords:**Intelligent transport technologies, road safety, data analysis, video analysis, accident prediction, cybersecurity, mobile applications, digital infrastructure, smart roads, Uzbekistan.

## 1. Introduction

Road safety is one of the key tasks in the transport policy of most countries. In Uzbekistan, as in other developing countries, the problem of road accidents remains relevant. In 2023, more than 10,000 road accidents (RTA) were registered in the country, resulting in 2,500 deaths. The main causes of accidents include:

- Speeding.
- Insufficient road lighting.
- Poor road surface condition.
- Violation of traffic rules (TR).

The introduction of intelligent transport technologies (ITT) allows for better control over the situation on the roads, a reduction in the number of accidents and an increase in road safety.

## 2. Research methods

The following methods were used to analyze the role of ITT in improving road safety:

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- **Statistical analysis** of road accident data in Uzbekistan over the past four years.
- **Comparative analysis** of the experience of ITT implementation in different countries.
- **Modeling of traffic flows** using intelligent systems.
- **Analysis of ITT efficiency** based on implemented technologies in Tashkent and other cities.

## 3. Results

### 3.1. Statistics of road accidents in Uzbekistan (2020-2023)

| Year | Number of road accidents | Number of deaths | Number of victims |
|---|---|---|---|
| 2020 | 9,500 | 2 300 | 8,000 |
| 2021 | 10 200 | 2,400 | 8 500 |
| 2022 | 10 800 | 2 450 | 9,000 |
| 2023 | 10 500 | 2,500 | 8 900 |

**Graph 1:**

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**Dynamics of road accidents in Uzbekistan (2020-2023)**

**.2. Main causes of road accidents in Uzbekistan (2023)**

| Cause | Percentage of total number of accidents |
|---|---|
| Speeding | 35% |
| Violation of traffic rules | 25% |
| Poor road conditions | 20% |
| Insufficient lighting | 10% |
| Other factors | 10% |

**Graph 2: Main causes of road accidents in Uzbekistan (2023)**

4. Discussion

**4.1. Implementing ITT to Improve Security**

In recent years, measures have been implemented in Uzbekistan to introduce ITT, including:

- **Video recording cameras** : More than 1,000 cameras have been installed in Tashkent, which has reduced the number of violations by 15%.
- **Adaptive traffic lights** : Optimize traffic lights, reducing traffic jams by 20%.
- **Mobile applications** : Drivers receive information about traffic jams, accidents and changes in traffic regulations.
- **Operations Control Centers** : Analyze data from cameras and sensors to quickly respond to accidents.

**4.2. Comparative analysis with foreign experience**

In other countries, the implementation of ITT has yielded significant results:

- **Germany** : Use of smart traffic lights reduces traffic jams by 30%.
- **Singapore** : Intelligent traffic management has reduced accidents by 25%.
- **USA** : Video surveillance on roads has reduced the number of speeding violations by 18%.

**4.3. Prospects for the development of ITT in Uzbekistan**

To further improve road safety it is necessary:

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- Expanding the network of smart cameras.
- Implementation of accident prediction systems based on artificial intelligence.
- Development of smart roads with adaptive lighting and dynamic markings.

## 5. Conclusion

ITT plays a key role in ensuring road safety. Analysis of road accidents in Uzbekistan shows the need to introduce new technologies to reduce accidents. The experience of developed countries confirms the effectiveness of ITT in managing traffic flows and reducing the number of road accidents. For the successful implementation of ITT in Uzbekistan, it is necessary to develop digital infrastructure, attract investment and improve the legislative framework.

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