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EXPERIENCE OF FOREIGN COUNTRIES IN THE FIELD OF IMPLEMENTATION INTELLECTUAL TRANSPORT SYSTEMS

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ABSTRACT--*The article considers the intelligent transport systems as an intensive way to resolve traffic problems in the leading countries of the world. The paper deals with international experience of Japan, China, the European Union and the United States in the implementation of intelligent transport systems, and the ability to apply this experience in the Uzbekistan, made for institutional change in the implementation of intelligent transport systems.*

Keywords-- *intelligent transportation system, traffic accidents, ITS Japan, ITS Europe, the emergency call, traffic jams, bandwidth, traffic flow.*

I. INTRODUCTION

The long-term concept of transport, of course, must be innovative and based on the advanced achievements of science. When developing a long-term concept for the development of transport, it is necessary to take into account the real possibilities of the Republic of Uzbekistan. The development of innovative concepts should be based on a systematic approach to the development of science and technology. Innovative development involves leadership. Intelligent transport systems as a possible main idea of a long-term concept of innovative development of transport. The impetus for the emergence of ITS was the growing transport problems in cities. Even with state-of-the-art technology, with which there is an abundance of modern vehicles, driving is still a dangerous and potentially fatal activity. The likelihood of emergency situations is especially high in large cities, where due to the overlap of the highways, a system is so complex that it can fail at any time and something goes wrong. Such a system depends on a large number of elements and if nothing is changed, then sad events cannot be avoided. Nevertheless, there is always room for positive changes that will avoid risk situations and minimize the negative effect. The traditional solution to such transport problems is the expansion of roads. However, this is only a short-term, quantitative solution to the problem, which does not allow to get rid of it, because the number of cars on the roads will also continue to grow. In this regard, the national program in the field of ITS will be an attempt to solve these problems in a qualitative manner, using the achievements of science and technology(Toshtemirovich, Adkhamovich, Abdiev, & Yunusov, 2019; Tursunbaevich, 2019; Yarkulova & Nasriddin, 2019).

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ITS achieves this effect by combining the equipment, software, and networks needed to collect, process, and transmit information to all road users.

Intelligent Transport Systems (ITS) is a complex engineering design that can reduce accident rate and road hazard by implementing integrated information systems that provide traffic management and allow you to quickly contact emergency medical care (SMP) in the event of a traffic accident. In addition, ITS play a critical role in terms of national security. It is no accident that this transport management technology was widely used 20-30 years ago in the United States of America, Japan, Germany, France, and China. At the dawn of the development of ITS, the above countries are just like today, Uzbekistan faced with the ability to use the means available to control traffic on roads(BOBUR et al., 2015; Kuralbayev, Sevim, & Abishev, 2017; Piven, Society, & 2006, n.d.).

To solve the above problems, several experts proposed several ways:

- A) extensive (still widely used in Tashkent), associated with the construction of road infrastructure. The totality of these tactics is also necessary, however, does not solve the underlying problems associated with the formation of congestion;

- B) intense. It offers, as a solution to transport problems, optimization and management of traffic flows through the introduction of modern science and technology, in other words, we are talking about ITS.

Based on a thorough analysis by the governments of foreign countries, an intensive way to solve transport problems was chosen, because ITS is the next level in the development of the throughput capacity of motorway traffic flows, which is efficient and safe. The government of the United States of America supports and actively develops ITS as the most useful way to solve traffic problems, different from the standard way to build new roads.

II. RESULTS

The common goal for all organizations involved in the promotion of ITS is to increase road safety and increase the efficiency of travel on city highways.

These are the key issues that affect urban residents on a daily basis. For example, in the event of a traffic accident, the response time and arrival of medical services is critical. Seconds in this situation are the line between life and death, so the ambulance must arrive at the scene in a matter of seconds or minutes. If the emergency call system is integrated into the ITS, then medical services receive information and coordinates from the scene of an accident within a few seconds, which allows you to save hundreds and even thousands of lives every day(Ibragimovna, 2019; Khodzhaevich, Khamidovich, Kalandarovna, Ugli, & Kalandarovna, 2019; Toshtemirovna & Ergashovich, 2019).

The next step in improving road safety is to reduce the risks that can cause accidents. This involves reducing congestion, the rapid evacuation of vehicles from the scene of the accident, as well as regular monitoring of transport channels for dangerous zones and obstacles. The problem is that the implementation of such a program requires a large number of labor, especially when it comes to such a large city as Los Angeles.

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Speaking about the US experience, here, as well as in Japan, the institutional form of organization provides for the active role of the Department of Transportation. At the federal level, the state program was adopted by Congress in 1991, and the development of programs and standards continued for another 5 years. It is noteworthy that in the legal aspect of the implementation of ITS, the integrity property is observed, that is, the system has the characteristic of reproduction, updating of legislation(News & 2017, n.d.; Ostonakulov, 2019).

Another center for the development of ITS is Asia, where Japan has been dealing with the issue of smart transport systems for over 40 years. The first attempts are dated 1973. The next step was the creation in 1996 of the ITS-Japan national transport development program.

For the development of ITS in Uzbekistan, by Decrees of the President of the Republic of Uzbekistan No. PP-2158 dated April 03, 2014 and No. PP-2569 dated August 01, 2016 “On measures for the further implementation of information and communication technologies in the real sector of the economy”. The development and implementation of SMPO-UZGPS is carried out in accordance with the desirability of introducing UzGPS mobile objects(Umedilloevna, 2019).

Starting in 2014, the Center, with the support of Uzbektelecom, has been working on the development, development and implementation of a satellite monitoring system for UzGPS mobile objects in the activities of various government bodies and departments.

UZGPS is a 100% local development taking into account modern technologies in the field of satellite monitoring of vehicles and has the ability to flexibly configure, modify and make the necessary changes depending on the tasks that arise.

To implement this work, the state unitary enterprise Toshkent Transport will be created in the structure of the khokimiyat of Tashkent. The first center for traffic management appeared in Uzbekistan in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan.

On measures for the further development of road transport infrastructure in the city of Tashkent. In the Decree of the President of the Republic of Uzbekistan “On a legal experiment on the introduction of a special management order in the city of Tashkent” No. UP-5515 of 08/17/2018, in order to further improve the city’s road transport infrastructure Tashkent with the implementation of universally recognized international standards and best practices in the road sector, in close coordination with modern requirements for ensuring road safety.

The first new enterprise will be introducing in 2019-2021 a unified concept of public transport stops, providing the necessary conditions for people with disabilities, the availability of Wi-Fi and an electronic display that shows the rest of the time until the arrival of the next public vehicle.

2-Among other tasks of the new structure - the introduction of a system of automated accounting and payment acceptance at car parks, the organization of the Unified Center for Management of Parking Space in Tashkent. The company will also organize the "Evacuation Service of the Tashkent City Administration" to evacuate cars in violation of traffic rules, non-payment of parking services, traffic accidents and other cases.

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3-Another interesting area of work is the planning, design, implementation of safe and effective programs and schemes for organizing traffic, including traffic control systems, modern intelligent information and communication systems, operating modes of traffic lights to prevent traffic jams, ensuring the efficient use of roads and road objects. It is planned to create a single center for managing all traffic lights objects online.

4-The enterprise will be required to expand the automated system of photo and video recording violations of traffic rules. Among previously unannounced projects is the launch of a system for checking vehicle insurance and vehicle inspection online.

The company will monitor and coordinate the movement of passenger vehicles, all utilities and emergency services (regardless of their legal form and departmental subordination), create conditions for the unimpeded movement of ambulances and fire services using GPS equipment installed on them.

5- the structure will create a single call center to receive and process citizens' appeals regarding transport and the city’s road transport infrastructure.

The introduction of UZGPS in the activities of industry services and subordinate organizations, with the total number of vehicles in the subordinate organizations of the Ministry, is about 2500 units, will give significant savings in money, as well as provide control over transport, including timely enforcement.

The experience of Japan is remarkablenot only for the institutional organization of the ITS implementation process, which was implemented on the basis of the national strategy for the development of ITS, but also because Japan proclaimed itself the country of “zero” goals on the roads at the beginning of the 21st century: 1 - zero loss on the roads; 2 - zero delays on the roads; 3 - zero inconvenience.

Another “native” from the Asian continent is our strategic economic and political partner, China. Since 1997, the Ministry of Communications has been involved in the development of ITS. The pilot project passed the creation of the “National Center for Engineering and Technology of ITS”. In the 21st century, progressive development continued at the level of attracting science and technology, which created the prerequisite for creating a national concept for the development of ITS in China, which was adopted in 2007. A distinctive feature that must be used in Uzbekistan is the selected form of ITS implementation, which is under total state control. There are five-year plans integrated into the economic development system(Muhammad et al., 2012).

On the European continent, the first attempts to create ITS were observed in 1991, when the non-profit organization ITS-Europe was created. In 2006, the European Union adopted the interstate concept of “Europe in motion. Sustainable mobility for our continent. ” In the future, it is planned that vehicles on road, rail and sea transport will have navigation systems and communications equipment similar to aviation, which creates the prerequisites for creating a continental transport management system. One of the main achievements of the ITS-Europe organization is the creation of an emergency call program, the essence of which is that when an accident occurs, the vehicle automatically sends coordinates to the nearest medical center, which reduces the reaction time to the accident and allows the ambulance to arrive as soon as possible.

- The use of such systems in practice allows you to:

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• reduce the company's operating costs for fuel and repairs by introducing strict accounting and reporting on the use of vehicles

- • automate many fleet management processes
- • improve the quality of service and passenger awareness
- • Benefits for passengers:
- • Timely receipt of information through the online scoreboard at bus stops;
- • Ability to schedule time;
- • Quality and safety of transport services;
- • Obtaining information about the movement of buses in real time, etc.
- • For transport companies:
- • Organization and automation of the dispatch service;
- • Accounting and control of the implementation of routes;
- • Automation of garage activity;
- • Accounting for vehicles;
- • Fuel consumption control;
- • For government bodies:
- • Monitoring compliance with the terms of the agreement for the provision of passenger transportation;
- • Ensuring the quality and safety of passenger traffic;
- • Unified system for monitoring vehicles of passenger carriers;
- • Accounting and control of routes (urban, suburban and intercity);
- • Analysis and statistics of car fleet activities in a single information space.

Assessment of the financial effectiveness of the project according to the recommendations, the potential for improving financial performance indicators take into account the financial consequences of its implementation for participants.

The following aspects of improving the financial efficiency of the project can be distinguished:

• increase in revenue through the provision of additional services based on the infrastructure of the Emergency Response System in road accidents

• reducing the cost of creating a system based on the results of technical design and commercial negotiations with equipment suppliers;

• reduction of the tax burden associated with the provision of communication services through the adoption of the necessary regulatory legal acts.

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Transport monitoring and control systems are used not only for tracking purposes, but also perform a number of other functions when installing additional navigation-related equipment. So, for example, it becomes possible to control fuel consumption. In addition, tracking systems allow you to plan your routes more efficiently and reduce unauthorized downtime.

The relevance of the problem lies in the fact that its solution is directly related to the effectiveness of the country's economy. Currently, projects are underway to implement ITS in the Uzbekneftegaz NHC (coverage of the Oil and Gas industry is 30%), the Ministry of Internal Affairs of the Republic of Uzbekistan (GUVD of Tashkent), the Republican Collection Service, Uzdonmakhsulot AK, Improvement Departments of Regional Khokimiyats, JSC Uzbekistan Temir Yullari ”and in other organizations.

A study of the government bodies and departments introduced into the abovementioned activities shows that the costs of introducing monitoring technologies in organizations pay off in a period of 1 to a year. This is due to many performance indicators that help maximize profits and minimize transportation costs.

Key performance indicators:

- Reduction of fuel costs from 15 to 30%;
-Growth of labor productivity by 30%;
- Reduction of expenses for vehicle repairs (maintenance) up to 10%, etc.

As the implementationpractice showed, the average daily mileage of automobiles of organizations decreased from 15 to 30%, due to the exclusion of “left” flights, which allowed us to show significant savings in fuel and consumables for servicing automobiles on a corporate scale. Due to this, the terms of continuous maintenance of vehicles were reduced.

III. CONCLUSION

Given that our country lags far behind in the field of intellectualization of the transport process, the development of ITS in Uzbekistan primarily involves an analysis of world experience. From the above experience of foreign countries, we can conclude that at present, the gap in the level of development of ITS between Uzbekistan and the advanced countries of the West can be described as civilizational, since the current state of development of ITS in our country corresponds to the level of development of "ITS-Japan" 1975-1980 However, we note that in all the considered examples, the implementation of ITS began with institutional reforms, giving ITS the status of a national project and developing an appropriate program, creating many years their plans for the development of science and technology in the country. This conclusion can form the basis of recommendations for the implementation of ITS in Uzbekistan.

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