

## AN ISSUE OF INTELLIGENT ROAD TRANSPORT IN KAZAKHSTAN

KAIRATOLLA K. ABISHEV\*, RUSLAN B. MUKANOV, ASYLBEK ZH. KASENOV,  
ALMAGUL N. BALTABEKOVA

*S.Toraighyrov Pavlodar State University, Pavlodar city, Republic of Kazakhstan*

\* corresponding author: [kairatolla76@gmail.com](mailto:kairatolla76@gmail.com)

**ABSTRACT.** The article reviewed the road transport sector of the Republic of Kazakhstan and found a significant role in ensuring road transport of freight and passengers. Shown needs to improve the work of transport-communication complex of the Republic of Kazakhstan on the basis of using the latest information and communication technologies.

Described advantages of realization of several intellectual transport technologies. Presented modern level of using satellite navigational systems on the automobiles, in addition written some automation and informational aspects of controlling transport processes.

Also presented measures to solve technological rearmament problem of the Republic of Kazakhstan.

**KEYWORDS:** The Republic of Kazakhstan, automobile transport, Intelligent transport systems, dispatching system.

### 1. INTRODUCTION

The Republic of Kazakhstan is entering a new phase in the reform of its economy, defining the purpose a significant increase in the efficiency of the national development system. Message from the President of the Republic of Kazakhstan N.A. Nazarbayev to the people has become a new strategic project on the path of accelerated development of the national economy, in close collaboration with the world of the global economy.

Presenting in his Letter deeply thoughtful and detail-calculated economic and social strategy for the further successful movement of the people of Kazakhstan to the prosperity, peace and the achievement of higher goals, the President gave her the name of "Nurly Zhol – Path to the Future". This program is intended to be the growth engine of the national economy in the upcoming years to improve the welfare and quality of life of every citizen in Kazakhstan.

According to the president, the most important area for the development of Kazakhstan's is the transport and logistics infrastructure. Improving the transport sector is more than urgent for Kazakhstan in conditions when there is a problem of intensification of trade and economic cooperation with Europe and East Asia. The introduction of intelligent transport systems will facilitate the organization of international transport, cargo tracking, and reduce the time of delivery, provide high performance and security of transport and logistics processes.

### 2. MAIN PART

Transport plays the most important role in the Republic of Kazakhstan life. On one hand, it is a very big territory (2725 thousand. km<sup>2</sup>), low density of

its population (an average of about 6 people / km<sup>2</sup>), very big distances between sources of raw materials and production resources. In this situation, transport and communication complex provide not only the economic but also the political integrity of the country.

On the other hand, the geographical location in the heart of the Eurasian continent, far from the main labor and capital markets result in the inevitable growth of the transport component in the export-import operations. It consequently leads to a weak integration into the global economic system. The geopolitical location of Kazakhstan between the capacious and dynamically developing markets of Europe, East and South-East Asia provides a chance to compensate this, by bringing transcontinental transit on the territory of the country[1].

#### 2.1. THE ROAD TRANSPORT ROLE IN THE COMMON TRANSPORT COMPLEX OF THE REPUBLIC OF KAZAKHSTAN

As we can see the world and now the domestic experience, road transport is maximally adapted to function in today's world.

Automobile transport is an inseparable and a very important component of transport significant role in transport and communication complex of the Republic of Kazakhstan. Among its most important, the following characteristics can be outlined:

- A. Popularity and wide availability,
- B. High maneuverability and speed of passenger transportation and goods delivery,
- C. Possibility of door-to-door delivery without the necessity of any additional interim operations with goods,

- D. Providing of near to zero-option short-distance service (delivery within the city and to the suburbs, and also those in rural areas),
- E. High degree of adaptation to different technological processes – both in industry and service sector,
- F. Relatively low capital capacity.

Given the conditions mentioned above, the automobile transport is considered an inseparable component of all modern transport technologies including the integrated and multimodal transportation.

The goods transportation activity in the Republic of Kazakhstan follow increasing trends in terms of capacity of delivered goods. According to RoK statistics Agency [2], 3 627,9 million tons of goods have been shipped via transport networks of the Republic of Kazakhstan from January to December in 2014, which is 3.7% more than within the same period in 2013. The cargo turnover for the given period was evaluated as equal to 487.4 billion t/km, 21293,00 billion pf passengers have been transported (which is 6.5% more than during January-December 2013), passenger turnover was 249,6 billion t/km (increase per 6.8% compared to 2013).

According to the Agency data, the proportion of automobile transport in relation to both transportation volumes and goods turnover has been increasing each year. Currently, the automobile segment occupies 86,23% from total amount of delivered goods, 7,54% belong to railway transport and 6.09% – to pipelines, and 0.14% – to the other means of transport (air, internal water transport) – see Figure1.

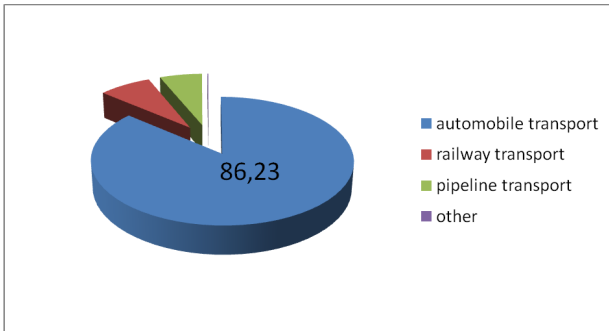


FIGURE 1. Distribution of total transportation volumes among the means of transportation.

As shown by international and domestic experience, automobile transport is ultimately adapted to be functioning in the conditions of market demand and supply. It can be proved by the fact that transport and communication complex was the primary choice for realization of privatization[3].

## 2.2. NECESSARY IMPROVEMENT FOR TRANSPORT AND COMMUNICATION COMPLEX OF THE REPUBLIC OF KAZAKHSTAN

At this level of social development, there is a need for technological improvement of the transport process

caused by a number of additional factors. First of all, the increased density of vehicular traffic as a result of development of economic and cultural ties and the accompanying increase in the process of trade flows and mobility.

In these conditions, for this time the intensification of all areas of human activity is becoming increasingly important factor of time and therefore introduces the task to improve traffic speed. Meanwhile, the transport infrastructure capabilities tend to lag behind the need to provide quality transportation in the face of increased intensity and speed. This often leads to the occurrence of accidents involving property damage, injuries and deaths.

The traffic growth creates many problems for instance, traffic control, associated with the need to make responsible decisions in conditions of high traffic density of vehicles that often becomes one of the causes of accidents caused by human error. From this perspective, the technological improvement of the transport process is essential and urgent in order to achieve goals for the society - improving the safety of vehicles[4]. Thus, the introduction of modern information and communication technologies in transport significantly reduces the influence of the human factor[5][6].

## 2.3. INTELLIGENT TRANSPORT SYSTEMS IN THE REPUBLIC OF KAZAKHSTAN

Intelligent transport systems – this is the system integration of modern information and communication technology and automation with transport infrastructure, vehicles and users, focused on safety improvement and efficiency of the transport process, comfort for operators, drivers and transport users.

The introduction of intelligent technologies in the transport sector of Kazakhstan made in the individual modes of transport and aimed at solving corporate problems.

Realization of certain intelligent transport technologies, and finally the formation of intelligent transport systems both have social and economic objectives, they are:

- A. Traffic safety improvement and, as a consequence, the reduction of social wastes in the transport sector
- B. Reduction in transport costs in the economy and other spheres of transport services,
- C. Improvement of the environment and saving human and material (f.e. energy) resources.

The strategic aim of the creation of intelligent system of road transport is the creation in the city: Republics of interconnected intelligent systems that control traffic of transport vehicles and special emergency services, housing management.

The strategic goal can also determine the formation of the republic competitive "road corridors", equipped with priority ITS technologies: movement controlling systems, traffic management systems that provide

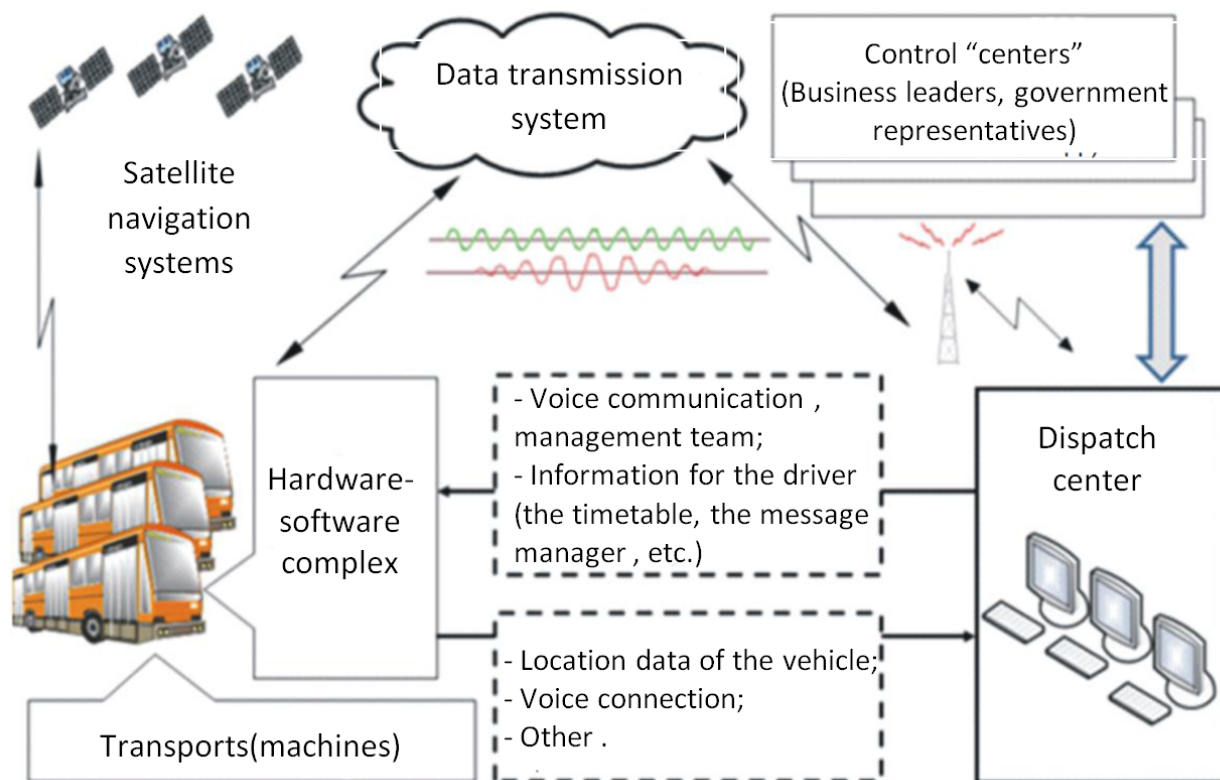


FIGURE 2. ANSDU work scheme, based on the satellite navigation.

driver information about road surface, traffic conditions, the recommended routes of driving in the real situations on the roads, the availability and location road service areas, roadside services and other[5].

One of the main directions of development of transport technologies in the passenger transport sector of the Republic of Kazakhstan is the introduction of computer-based navigation systems of dispatching management. These systems use the location of vehicles with the signals of global navigation systems GPS and GLONASS.

Dispatching system based on satellite navigation systems allow operational management of transportation, fixing transport work by the transmission and processing of information about the location of vehicles, access to that information for all interested participants of the transport process. Schematic diagram of the operation of the automated dispatch control navigation systems based on satellite navigation is shown in Figure2.

Installation of navigation systems on public passenger transport are focused not so much on the movement of the vehicle itself, but rather on comfort and safety of passengers[7].

### 3. CONCLUSION

The need of the introduction of modern innovative technologies in all parts of the economy is one of the circumstances to improve its efficiency in the Republic of Kazakhstan. It is fully recognized by the

government at the highest level and has repeatedly emphasized on public statements of the President of Republic of Kazakhstan.

As for technological modernization of the transport industry of the Republic of Kazakhstan, the following tasks should be solved:

- (1.) formation of a single information space,
- (2.) training of qualified personnel to work in the new technological environment,
- (3.) the formation of regulatory and legal framework, standardization and harmonization of requirements for technical solutions in the field of information support of transport activities.

Solving these problems is very important to improve the operation of transport.

### REFERENCES

- [1] M. Bekmagambetov, R. Zhumagulov. *The transport system of Kazakhstan in modern conditions*. Almaty, 2008.
- [2] <http://www.stat.gov.kz>, last accessed May 2016.
- [3] K. K. Abishev, R. B. Mukanov. *Improving Road Traffic Safety in the Republic of Kazakhstan (RoK)*. Driver-Car Interaction and Safety 2014, pg. 43-46.
- [4] M. Novák, Z. Votruba, M. Svítek, P. Bouchner. *Improvement of bus and truck driving safety*. (2007) Conference Proceedings – IEEE International Conference on Systems, Man and Cybernetics, 1, art. no. 4273847, pp. 310-315.

- [5] M. M. Bekmagambetov. *Intelligent Transport Systems in the Republic of Kazakhstan*. Almaty, 2013.
- [6] P. Bouchner, J. Faber, M. Novák, et al. *Human decision aspects in interactions with artificial systems*. (2009) Proceedings of the 2009 Euro American Conference on Telematics and Information Systems: New Opportunities to Increase Digital Citizenship, EATIS '09, art. no. 1551749.
- [7] V. M. Vlasov. *Transport telematics in the road sector*. Moscow-MADI, 2013.