



# THE ROLE OF INNOVATIVE TECHNOLOGIES IN IMPROVING THE QUALITY OF TRANSPORT SERVICES

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## I. INTRODUCTION

The study of the quality of road transport services is possible using various approaches, for example, both from the standpoint of the process of providing road transport services, and from the standpoint of the sphere of consumption of road transport services. Indeed, if motor transport services are provided by qualified enterprises in conditions that meet all the requirements of scientific and technological progress, then, other things being equal, the result will be the best, and, therefore, the quality level will be the highest.

This view takes into account three components of the quality of road transport services:

- the quality of the structure (organizational and technical quality of resources: material and technical base, staffing, etc.);
- the quality of the process (timeliness of delivery of goods and passengers, the choice of an adequate strategy for the technology of providing services, compliance with norms and standards, etc.);
- the quality of the result (the socio-economic effect in the region from the measures taken).

## II. LITERATURE REVIEW

Almost all developments in the field of assessing and ensuring the quality of road transport services, in one way or another, are associated with the use of approaches such as structural, process and effective.

It is also important to note that the categories "price" and "quality" are closely related, however, quality is one of the determining factors in the competition between road transport enterprises for the consumer of services. Evaluation is the final part of quality management, which involves an analysis of the economic and social efficiency of the provided road transport services. Social effectiveness has a broader

meaning. The criteria of social efficiency are the indicators of the development of the region and the satisfaction of the population from the received motor transport services.

## III. ANALYSIS

Economic efficiency is determined by the ratio of the effect (result) and costs. Cost-effectiveness analysis is necessary to improve the quality of services, when the most important problem is to achieve maximum results with limited costs. However, as the analysis of the current mechanism for managing the quality of the provision of road transport services shows, quantitative and qualitative indicators create at the same time contradictory situations. This is due to the fact that road transport companies strive, first of all, to increase the volume of services, and quality issues fade into the background.

Moreover, there may be cases of insufficient quality services, i.e. not meeting the established standards and regulations. All this indicates that the economic goals of road transport enterprises and their consumers do not coincide, which leads to a decrease in the efficiency of the functioning of the production processes of road transport services.

In this regard, there is a need to develop innovative technologies to improve the quality of the provision of road transport services in the region, which will ensure the maximum coordination of interests between the enterprise and the consumer of services in terms of quality and increase the competitiveness and efficiency of the operation of the road transport enterprise. That is why any trucking company must develop and improve the technologies of the work performed and the variety of services provided through the implementation of promising innovative developments.



Only in this case it will have an effective competitive advantage in the road transport services market. Such innovations should apply to new services, methods of their production, as well as innovations in the organizational and financial spheres that bring positive results. Innovation in the field of road transport services should be understood as the use of scientific advances in the form of new technologies, types of products and services, organizational, technical and socio-economic solutions of a production, financial, commercial, administrative or other nature in order to obtain an economic, social or environmental effect.

At the same time, the innovative activity of a motor transport organization is primarily aimed at increasing the competitiveness of products (services). The most important areas of innovation in road transport are primarily associated with the use of modern technologies for organizing the transportation of goods and passengers, automation and informatization of all links of the transport chain (primarily customer service processes).

The primary criteria for assessing the effectiveness of the use of innovations in the field of road transport services are: dynamics of the use of energy-saving technologies; the degree of automation of control systems; saving time and minimizing the cost of delivering goods and passengers with high reliability of their transportation, etc. The transition of the motor transport complex to an innovative way of development required a large-scale introduction of new technologies.

Currently, in the field of road transport services, such innovative technologies are already used as monitoring the location of road transport, electronic fare payment, operational fuel accounting, mobile video registration, etc. Accordingly, we will consider the most common of them. Currently, the tasks of determining the location of vehicles, valuable cargo, etc. are extremely relevant both for state law enforcement agencies and for private structures.

As a rule, such tasks are solved in the process of monitoring the movement of moving objects, ensuring the safety of vehicles and their search in the event of theft, as well as in the process of escorting vehicles and valuable cargo, etc. vehicles as part of systems for integrated quality assurance of services. The consumers of such systems are very often legal entities and individuals.

Among the legal entities, the following should be highlighted: passenger and cargo carriers (first of all, carriers of especially valuable and dangerous goods); car rental organizations; taxi companies; bus

fleets, etc.; collectors; road transport for handling oversized cargo; ore-dressing and metallurgical plants and other companies in which obtaining prompt and reliable information about the location and condition of vehicles and transported goods, the possibility of operational management of these objects are of great importance.

#### **IV. DISCUSSION**

The second category includes private car owners and individual vehicle users. Among other areas of application of systems for determining the location of vehicles, one can single out the emergency response services of the Ministry of Emergency Situations, the police, an ambulance, etc. It is important here to improve the safety of transportation and the safety of cargo, and to optimize transport routes. Consequently, this leads to a reduction in costs and an improvement in the quality of the provision of road transport services.

At the same time, in addition to the main task of such mobile navigation systems - control over the location and condition of mobile objects, they allow solving a number of specific tasks that improve the quality of services:

- obtaining operational information about the location and condition of vehicles and displaying their movement on electronic maps real time;
- automation of control over the movement of road transport and the actions of the driver;
- ensuring the safety of transportation and the driver;
- optimization of transport routes;
- counteraction to theft of vehicles, etc.

The following can be distinguished as available means of monitoring vehicles.

1. GPS (Global Positioning System). This satellite navigation system makes it possible to determine the location and speed of objects in any place on the Earth (excluding the circumpolar regions), in almost any weather, as well as in outer space near the planet. The users of this system are offered various devices and software products that allow:

- to see their location on an electronic map;
- lay routes taking into account existing road signs;

provide a search on the map for specific houses, streets and other infrastructure facilities. At the same time, satellite monitoring of road transport using GPS is carried out for the location, speed of cars, which allows you to control their movement.

2. The Global Navigation Satellite System (GLONASS) is a Russian satellite navigation system,



which is designed for operational navigation and time provision of an unlimited number of land, sea, air and space-based users. Moreover, access to civil GLONASS signals anywhere in the world on the basis of the Decree of the President of the Russian Federation is provided to Russian and foreign consumers free of charge and without restrictions.

Video surveillance systems. With the advent of such video surveillance devices on the market, it became possible to create complex video surveillance systems, combine them with computer technologies, which significantly expanded the capabilities of such complexes. The proposed modern monitoring systems generally satisfy the following capabilities:

- provision of two-way digital and voice communication between vehicles and a dispatch point;
- determination of the state of safety of the vehicle and cargo (safety of locks, temperature inside the refrigerator, etc.) and the current location;
- operational display on the monitor screen of the geographical map of the area with the situation and marks of the current location of the vehicle;
- notification of an "emergency" with a controlled vehicle by means of an emergency call button signal, triggering of various on-board sensors, etc. with an indication of its exact coordinates;
- control of various actuators on vehicles (door lock, engine, etc.) according to specific commands;
- ensuring control over the passage of the established route and adherence to the traffic schedule, indicating the time lag or lead;
- documenting, storing data from controlled vehicles for subsequent analysis;
- automated control of vehicles and cargo in specially equipped parking lots, etc.

The introduction of such systems makes it possible to improve the quality of services provided by ensuring the safety of cargo, optimizing the use of road transport, operational management of it, strengthening control over its operation and the discipline of service personnel, and reducing operating costs. Automated electronic fare collection allows for a fairly wide range of services (primarily for public transport passengers) and provides a completely transparent financial control. In this case, the collection of fares is carried out using paper tickets and contactless smart cards.

This fare collection system is directly linked to the information system in vehicles, fleets or dispatch centers. Moreover, passengers are informed about the timetable of vehicles, and remote monitoring of the transport situation in the region can be carried out from the control center. All existing equipment and

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Therefore, in recent years, systems for automatic metering of fuel consumption and operating modes of vehicles have become widespread. These systems are designed for continuous monitoring of fuel consumption (in real time) with storing data in the device memory, more accurate accounting of fuel consumption, analysis of the complex operation of a car at any time, and optimization of operating costs.

Expanding the capabilities of multimodal logistics services. This innovative direction creates the preconditions for the growth of regional production where the transport infrastructure, which will manage the supply chain, will be located.

The use of multimodal logistics services means planning and managing the activities of trucking companies associated with all types of logistics management activities, as well as coordinating and cooperating with partners (suppliers, intermediaries, service providers), as well as with customers. That is, this system integrates the supply and demand management process within the region on the road transport services market. Another innovation that improves the quality of road transport services can be a "virtual" terminal.

This system is aimed at increasing attractiveness, increasing the number of passengers, and increasing the availability of services. To this end, it is advisable to unite the fragmented transportation network and create a common network for the sale of tickets and informing passengers for a particular region. This will lead to the emergence of a "virtual" terminal based on the use of modern information technologies and common technical standards, thus forming a common information system for passengers and a base for a passenger logistics center.

Thus, innovative activity in the field of road transport services should be associated with a predictable result, which leads to changes both within the organization and in the external environment, since the expansion of needs for this type of service leads to transformations in the production process of



commodity producers and in the information systems of a particular region. At the same time, the development of the sphere of motor transport services creates a fundamentally new competitive environment, providing more qualitatively new needs for goods and services.

At the same time, it becomes necessary to coordinate and organize the integrated interaction of a variety of financial and management techniques and information systems implemented in the organization, as well as to create and maintain in the organization a card index or repository of optimal management decisions, various expert systems, tools and decision support systems in the field of quality assurance services provided. The fulfillment of these conditions should launch rather complex processes of self-organization and business adaptation in changing external and internal conditions, provide additional competitive advantages due to the manifestation of a synergistic effect and increase the level of manageability, competitiveness of the enterprise and the quality of services provided. This task implies the development of an algorithm for the implementation of innovations that improve the quality of road transport services in the region.

The proposed algorithm consists of the following stages.

1. Definition of the problem (formulation of the problem). At this stage, firstly, it is necessary to form a team to develop innovative reserves for improving the quality of services and, secondly, in the process of this team's work, to directly determine the problem itself (or the formulation of the problem). To clearly describe the problem, this team must find out what questions and tasks need to be solved, where these questions and tasks appear, and what factors play a significant role in this. For this purpose, it is necessary to use information from all possible sources (complaints and complaints from customers, research into requests and expectations of consumers, etc.).

2. The second stage (analysis of the causes and problems of deterioration in the quality of the provision of road transport services) is presented in the form of a process map (flow diagram), through which all stages from entry to exit are reflected. At this stage, the members of the team created to solve the problem consult with the workers directly involved in the process and clarify whether the measures taken lead to an improvement in quality. In addition, daily registration of inconsistencies, complaints and complaints from consumers of motor transport services is carried out. In this case, it is necessary to find out the details of the problem and translate.

## **V.CONCLUSION**

At the same time, a competent formulation of the problem outlines its properties and specificity, measurement, identifies the consequences and results, and not the reasons.

Innovation in the field of road transport services is an integral part of effective production and market activities, since it is it that ensures the strategic stability of companies in the rapidly developing services market. It is becoming more and more obvious that the sector of road transport services can provide a significant increase in employment both today and in the future, and become one of the "locomotives" of economic growth.

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