

need to improve transportation safety and study the factors affecting it arose with the development of market-based methods of transport management, changes in the structure and management system of the transport industry of Ukraine. Such qualitative changes have led to the development in this field of new models, methods, methodologies of transportation safety management capable of comprehensively solving the problems of transportation organization, their legal, financial, and information support.

In order to identify methods of improving road safety in the region, an in-depth analysis of the state of accidents in the territory of the General Directorate of the National Police in Cherkasy Region was conducted by types, causes, days of the week, time of traffic accidents, number of victims, number of dead, etc. Dangerous sections of highways were identified and an experimental study was conducted to identify the causes of traffic accidents. In the course of the experimental study, measurements were made that allow to calculate the speed of vehicles that, violating traffic rules, were overtaking on sections of highways with blind turns. From the obtained results, it can be concluded that the main causes of traffic accidents are the violation of traffic rules, which is caused by the difference in traffic speeds in the flow and the unconscious attitude of drivers to the corresponding traffic situation.

As a result of the conducted research, recommendations were provided for optimizing the organization of traffic on dangerous sections of highways. Namely, it is proposed to use the methodology of experimental research on other dangerous sections of the country's highways and to install dynamic traffic signs that will allow regulating the maximum permissible speed depending on the selected factors on the relevant sections, thereby reducing the speed difference in the flow of traffic and punishing violators for exceeding the speed limit. In addition, a very important element of improving safety on the country's highways is the dissemination of information programs on compliance with traffic rules among the country's youth. The proposed method is recommended to be used to reduce the number of road accidents, and accordingly, to reduce the number of victims of road accidents in the territory of Ukraine.

quality, quality indicators, transport services, transport network

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Digitalization of truck companies: current challenges and development prospects

Innovations in the logistics support of enterprises have always played an important role in business. They are aimed at improving service delivery and information dissemination. Therefore, individual clients see the traditional "value" for logistics: short service time, availability and timely delivery. This article examines the supply chain, the goal of which is to deliver a quality product in the shortest possible time, with the lowest costs and in the best possible condition. It is possible to fulfill these requirements only on the basis of small business access to innovative technologies. To implement these technologies, it is advisable for road transport enterprises to use existing management practices, namely: construction of modern infrastructure; provision of preferential leasing conditions to car carriers; solving the issue of obtaining permits, crossing the border, downtime; creation of high-quality digital platforms for information exchange and interaction between transportation market participants.

innovations, information and communication technologies, logistics, logistics services, logistics design, demand, transport unit, transportation route

Introduction. There is a fierce competition between states for dominance in the world market for the provision of transport services, where competitive advantages are given by speed, safety and efficiency, which directly depend on the wide use of innovations and high technologies. The level of innovative transport technologies reflects and increases the level of the country's competitiveness.

Innovations, information and communication technologies (ICT) are currently the main tools which conduct modernization in the transport sector. Modern information systems determine the formation of a single information space for all participants of the interaction. Noting the vastness of Ukrainian territory and the transport services coverage of the most remote regions and points of the country, transport itself is the most territorially distributed industry. Therefore, the main feature of transport infrastructure is its high technological dependence. The constant exchange of information between very distant consumers from other points is needed in the transport industry. This determines the necessity of the usage of new equipment and data transmission technology.

Analysis of recent researches and publications. Domestic and foreign scientists are investigating the issue of digitization of road transport enterprises. D.O. Vlasenko studied the theoretical foundations of the strategic planning process of transport enterprises, noting the specifics of the transport industry [1-2]. In scientific works [3-7] it was established that interest in digitization is predetermined by competitive advantages, due to the provision of additional value of the product through high-quality service, high level of communication, improving the company's image, reduction of the price using the automation and digitization of business processes, transparency of the company's internal and external processes, increasing customer loyalty to the company. Scientific works [8, 9] reveal development prospects and the level of digitalization of industrial enterprises.

The aim of the article. The aim of the article is to analyze the implementation of innovative, information and communication technologies in transport companies. Therefore, to reveal this dependence to provide the functioning of agglomerations through logistic supply chains and assessment of the prospects for their development.

Results. Innovations, information and communication technologies (ICT) further the expansion of the information space, creating new innovative products, and reducing information costs. It accelerates and simplifies the search and exchange of information, promotes the strengthening of cooperation between companies, which affects the methods of operational activity of business entities, people's search for favorable conditions for life, moreover the quality of interaction between the country's population and its government. Changes in economic processes, the reorientation of production from the creation of material goods to the provision of services, the globalization of the economy are noted by scientists as the most fundamental signs of the development of a new type of society in the era of the formation of informatization and digitalization processes [3-8].

In the conditions of the globalization of the world economy, the transformation of the economic situation, the growth of the needs of the population and business entities in transport services, the search for a solution to the problem of improving transport technologies of Ukrainian enterprises in the context of the development of the application of logistics and logistic approaches in management is becoming increasingly relevant.

Through logistics, the organization can function effectively, implementing activities punctually, quickly and in accordance with the requests. The main factor shaping all logistics activities is to satisfy the needs (requests) of consumers. In terms of technological progress, trucking technology is developing. Therefore, it will be relevant to study not only different methods of transportation, but also special rules for transportation of various types of cargo.

Optimization of the loading of transport units and transport routes, shipment of goods online and expansion of the entire path are tasks which require fast processing, high accuracy and consistency in logistics purposes. Modern innovative ICT allows to implement tasks of this level. These days, there are many point solutions that allow to reduce the time of delivery of goods and costs related to transportation, to plan and manage the movement of goods. These solutions exist for all types of transport, this area has become widely developed in motor vehicles with the beginning of the usage of GPS navigation, which allows tracking the location of each transport unit in real time.

Transport logistics cannot exist without special Internet services that allow to plan product delivery channels and logistics chains, without prototypes of virtual forwarding services, without transportation route planners that allow you to create routes interactively. Internet video screens allow the dispatcher of transport companies to see the situation in restricted areas, in places of transshipment of goods, to control transportation on request. The logistics and telematics program TEDIM is widely used in international practice.

Modern specialists in the field of logistics note the new stage in the development of logistics, which is characterized not only by the widespread usage of Internet technologies in practice, but also by the intensification of activities in the field of logistics design (Logistics Project, Logistics Engineering), renovation (Logistics Renovations, Logistics Reengineering) and interactive supplying of logistics chains (Logistics Environment, Acquisition Logistics Engineering) [8-10].

The macro-temporal concept of the life cycle of the logistics chain is one of the most successful generalizations of new directions in logistics, along with traditional ones. This concept is based on the CALS (Continuous Acquisitions and Life cycle Support) methodology, that is the implementation of a system approach in logistics.

The work [11] defines the main problems of transport logistics the explanation of which allowed the authors to offer ways to solve them (Figure 1).

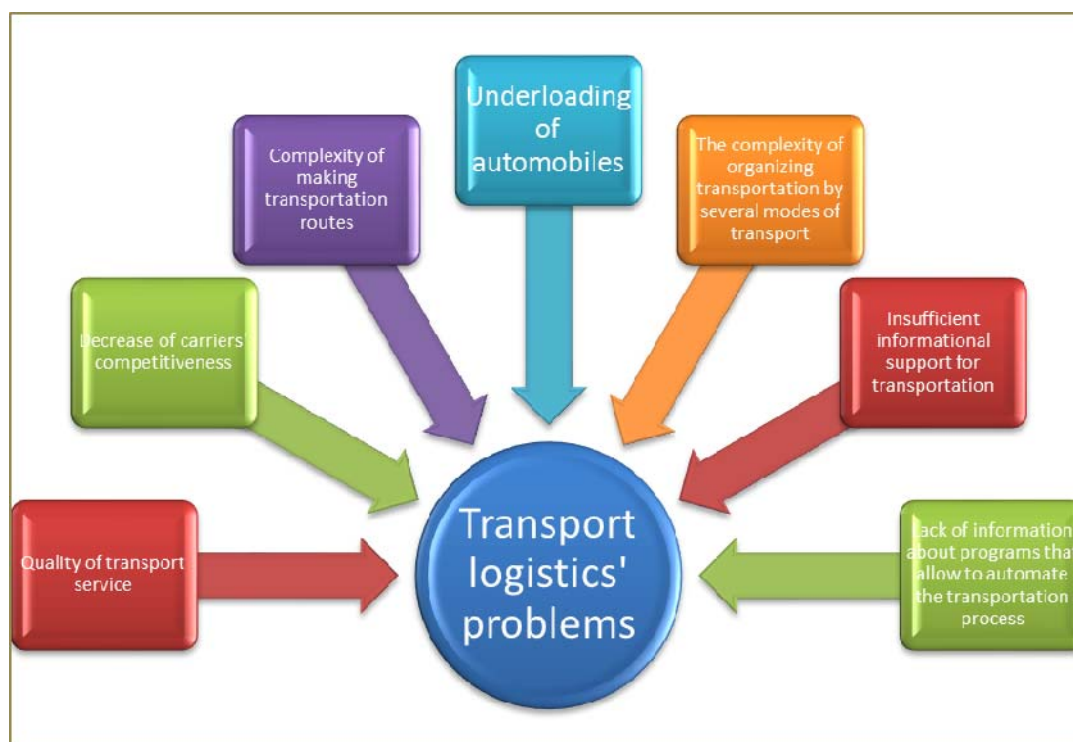


Figure 1 – Current problems of transport logistics

Source: [11]

These problems are relevant for wholesale trade with substantial trade flows and trucking.

Therefore, modern manufacturers are suggested to create an association of manufacturers in the form of a union, transferring individual functions to them in order to obtain the effect of scale in the model of the region and central sections (agglomeration).

The issue of spatial agglomeration is considered using the example of unions, associations of producers' enterprises (agglomerations) operating in the economic space L.

Modeling the benefits of agglomeration as a function of production is defined in its simplest form as follows:

$$X = g(N)f(l, k) \quad \text{при } g'(N) > 0, \quad (1)$$

where X is the volume of production, f is the production function used for the established company, l - labor, k - capital; $g(N)$ is a function of the size of the union (association) N , the arguments of which are external to the production enterprise and expresses the benefits of agglomeration.

The advantages of agglomeration are considered as a prerequisite for the creation of an association of producers and as a sufficient condition if they exceed the costs of transportation [11-13].

If geographical space will be homogeneous in all respects (resources and people) [14], it can be supposed that activity X implements economies of scale and it exceeds transport costs generated by geographic concentration [15]. The impact of a change in the consumption of product i ($i = 1, \dots, n$) will be examined basing on the function of maximized utility for the consumer with a budget for purchase, where s is the distance between the producer and the consumer, p_i - price CAF; p_i' - price FOB, x_i - consumed amount, t_i - transportation price, u - utility function, $u_i = \partial u / \partial x_i$, $u_{ij} = \partial u_i / \partial x_j$, Y - consumer's budget; λ - Lagrange multiplier. Maximization of the utility function $u = u(x_1, \dots, x_n)$ provides the following equilibrium conditions: $Y - \sum_i p_i x_i = 0$, $u_i = \lambda p_i$ ($i = 1, \dots, n$).

The impact of space on demand is determined by differentiating both conditions with respect to distance s and price p_i , which are complex functions:

$$\partial Y / \partial x = \sum_i (p_i \partial x_i / \partial s + x_i \partial p_i / \partial s), \quad (2)$$

$$\partial u_i / \partial s = \sum_j u_{ij} \partial x_j / \partial s = \lambda \partial p_i / \partial s + p_i \partial \lambda / \partial s \quad (i = 1, \dots, n). \quad (3)$$

Substituting $p_i = u_i / \lambda$ in (1) and (2), two conditions are obtained, which can be solved using Cramer's rule and allow to determine $\partial x_i / \partial s$ - change in product consumption depending on the distance to the producer:

$$\partial x_i / \partial s = \partial x_i / \partial Y \times \partial Y / \partial s - \partial x_i / \partial Y \times \sum_j x_j \frac{\partial p_j}{\partial s} + \lambda \sum_j \frac{\partial p_j}{\partial s} \cdot \frac{U_{ij}}{U} \quad (i = 1, \dots, n). \quad (4)$$

Where U is the determinant of the matrix u_{ij} ($i, j = 1, \dots, n$), U_{ij} - its minors. Note that the change in consumption consists of the sum of three components, each of which describes a different type of impact on the change of demand. The second and third expressions (3) contain $\frac{\partial p_j}{\partial s}$, it is the cost of transportation t_i . Therefore, the demand basing on location of the

consumer will vary according to t_i and it can be decomposed into two components. Since $p_i = p_i' + t_i s$ it can be written as follows:

$$\partial x_j / \partial t_j = s(-x_j \partial x_i / \partial Y + \lambda U_{ij} / U) \quad (i = 1, \dots, n). \quad (5)$$

This expression shows that the impact of a change in the price of transportation also depends on the distance s .

Moreover, adapting the interdependence between goods (through prices and substitution) has consequences that were formalized by Long and showed that the quantity of the purchased i good does not necessarily decrease with increasing of distance s ; because if CAF prices for goods produced in a central production center increase with distance from it, they consistently decrease as they approach other production centers. Therefore, substitution can have a positive effect on the volume of purchased goods, the price of which is constantly increasing.

Conclusions:

1. Leading market experts noted that pilot projects for the automation of the transportation process showed a good result - logistics costs are reduced. Therefore, the Ukrainian government needs to discuss the issue of smooth transition to the maximum coverage of all motor vehicle companies interested in digitalization.

2. The issue of a single digital space is relevant. The Ministry of Transport should offer to develop a platform to submit data. Based on them, travel documents will be created, cargo will be tracked and the transportation process will be managed. Smart roads, existing abroad, are good example.

3. There is a necessity and desire to manage the transportation process on highways to have direct effects on consignors, carriers, and modern unions (agglomerations). They will not actually drive up to the warehouse, port or entering the highway look at the traffic on the road, but first plan the route and regulate shipments.

4. It can be claimed that the modernized high-tech transport infrastructure, including the development of a network of innovative logistics systems for passenger service and cargo handling, the formation of intelligent transport systems, will ensure the maximum usage of Ukraine's transport potential.

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Сучасні тренди інноваційної політики автотранспортних компаній: виклики та перспективи розвитку

На сьогоднішній день між державами відбувається гостра конкуренція за домінування на світовому ринку надання транспортних послуг, де конкурентні переваги полягають у швидкості, безпеці та ефективності, які безпосередньо залежать від широкого використання інновацій та високих технологій. Рівень інноваційних транспортних технологій відображає та підвищує рівень конкурентоспроможності країни. Інновації в матеріально-технічному забезпеченні підприємств завжди відігравали важливу роль у бізнесі. Вони спрямовані на покращення надання послуг та поширення інформації. Тому індивідуальні клієнти бачать традиційну «цінність» для логістики: короткий термін обслуговування, наявність і своєчасну доставку. У цій статті розглядається ланцюг поставок, метою якого є поставка якісного продукту в найкоротші терміни, з найменшими витратами та в найкращому стані. Виконати ці вимоги можливо лише за умови доступу малого бізнесу до інноваційних технологій. Для реалізації цих технологій підприємствам автомобільного транспорту доцільно використовувати наявні управлінські практики а саме: побудова сучасної інфраструктури; надання автомобільним перевізникам пільгових умов лізингу; вирішення питання отримання дозволів, перетину кордону, простоїв; створення якісних цифрових майданчиків для обміну інформацією і взаємодії між учасниками ринку перевезень.

Актуальним є питання єдиного цифрового простору. Сьогодні Мінтранс має розробити платформу, куди можна буде передавати інформацію, на основі якої створюватимуться проїзні документи, відстежуватимуть вантаж і керуватимуть перевізним процесом. Можна стверджувати, що модернізована високотехнологічна транспортна інфраструктура, включаючи розвиток мережі інноваційних логістичних систем обслуговування пасажирів і вантажопереробки, формування інтелектуальних транспортних систем, забезпечить максимальне використання транспортного потенціалу України.

інновації, інформаційні та комунікаційні технології, логістика, логістичне обслуговування, логістичне проектування, попит, транспортна одиниця, маршрут транспортування

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