UDC 338.47

Ning Yulin, L.V. Grintsevich
Belarusian National Technical University
Minsk, Belarus

DEVELOPMENT OF TRANSPORT INFRASTRUCTURE AS A FACTOR IN INCREASING THE STABILITY OF THE LOGICAL ROUTE

Abstract. *Development of transport infrastructure plays a key role in increasing the sustainability of logistics routes, ensuring more efficient and safe movement of goods. In the context of globalization and the growth of the digital economy, improved infrastructure helps reduce costs and risks, and increases the flexibility and speed of delivery. The study aims to identify the relationship between the level of infrastructure development and the sustainability of logistics chains.*

Нин Юйлинь, Л.В. Гринцевич
Белорусский национальный технический университет
Минск, Беларусь

РАЗВИТИЕ ТРАНСПОРТНОЙ ИНФРАСТРУКТУРЫ КАК ФАКТОР ПОВЫШЕНИЯ УСТОЙЧИВОСТИ ЛОГИСТИЧЕСКОГО МАРШРУТА

Аннотация. *Развитие транспортной инфраструктуры играет ключевую роль в повышении устойчивости логистических маршрутов, обеспечивая более эффективное и безопасное перемещение грузов. В условиях глобализации и роста цифровой экономики улучшение инфраструктуры способствует снижению издержек и рисков, а также повышает гибкость и скорость доставки. Исследование направлено на выявление взаимосвязей между уровнем инфраструктурного развития и устойчивостью логистических цепочек.*

In the context of growing population mobility, rapid shifts, and modernization in production processes, the significance of transport infrastructure—as a core element in regional economic development and a key factor in its resilience—is on the rise.

Transport infrastructure, essential for enhancing a region's operational efficiency and structuring its economy, supports the connectivity of territories with transport networks and the optimized distribution and delivery of goods. As a multifaceted component within the global economic framework, transport infrastructure reflects the development level of any region, influencing competitive strengths and the evolution of production networks.

The establishment of high-quality transport infrastructure is increasingly recognized as essential for fostering economic growth and enhancing the population's quality of life. Transport infrastructure represents a sophisticated network linking cities and facilitating human activity, intertwining social, economic, and ecological systems as urbanization and population growth accelerate. Additionally, this network plays a critical role in promoting socio-economic development and improving life quality through the creation of intra-city connections. Infrastructure between cities fosters integration and resident mobility, which, in turn, substantially drives regional and national economic growth. However, ineffective transport planning can lead to negative outcomes, including environmental degradation, increased road accidents, climate change impacts, higher carbon emissions, and reduced transport efficiency [1]. Thus, a pressing need arises to assess the wide-ranging impacts of transport infrastructure through existing studies.

The transport system plays a pivotal role in ensuring sustainable development. It serves not only as a crucial tool for addressing social, economic, and technological issues but also presents environmental risks, contributes to road accidents, and poses health hazards [2]. Annually, the cumulative damage from these adverse effects reaches approximately 7-10% of the gross domestic product [3].

Transport infrastructure plays a key role in ensuring the efficient functioning of logistics systems. The development of transport infrastructure not only improves the availability and reliability of logistics routes, but also helps to increase their sustainability. The sustainability of a logistics route is determined by the system's ability to adapt to changes, minimizing risks and ensuring the continuity of transport processes. This article examines the main aspects linking the development of transport infrastructure and increasing the sustainability of logistics routes.

Transport infrastructure includes roads, railways, ports, airports and other facilities that ensure the movement of goods and passengers. The development of this infrastructure is a prerequisite for the efficient functioning of logistics systems. Modern transport networks can reduce the time and financial costs of delivering goods, which, in turn, increases the competitiveness of enterprises. [4]

The sustainability of logistics routes depends on many factors, including the reliability of vehicles, the state of the infrastructure, the organization of cargo transportation and the readiness to respond to unexpected circumstances. The main aspects of sustainability are:

Flexibility: the ability to quickly change routes and delivery methods in response to changes in demand or transportation conditions.

Reliability: the ability of the system to maintain service levels while minimizing delays and losses.

Adaptability: the ability of the system to respond to external changes such as weather conditions, economic fluctuations, and technical failures.

The development of transport infrastructure helps to increase the sustainability of logistics routes in the following ways:

Improving the quality of infrastructure: modern roads, bridges, and other facilities reduce the likelihood of accidents and delays. This, in turn, increases the reliability and predictability of logistics processes.

Integration of different modes of transport: the creation of multimodal transport hubs allows for the optimization of transportation and increases the flexibility of logistics solutions. For example, the presence of ports connected to railways and road transport facilitates the transportation of goods and minimizes delivery times.

Implementation of innovative technologies: the use of modern technologies such as automation, real-time monitoring, and transport management systems allows for more efficient management of transportation processes and response to changing conditions.

As an example, we can consider the development of transport infrastructure in Europe and Asia. In the countries of the European Union, projects are actively being implemented to improve rail and road communications, which helps reduce the carbon footprint and increase the sustainability of logistics chains. In Asia, especially in China, high-speed train networks and modern ports are actively developing, which allows for a significant reduction in transportation time.

- The impact of transport infrastructure covers many aspects, including human, economic and environmental. These links are supported by a number of economic mechanisms activated through the improvement of transport infrastructure, among which are:
- Good infrastructure is the basis for the provision of efficient transport services for both freight and passenger transport. This, in turn, facilitates key economic activities and overcomes geographical barriers.
- Efficient logistics systems facilitate trade by reducing the costs of access to international markets and increasing the competitiveness of local companies and their products.
- Passenger transport systems increase the productive capacity of the economy, expand labour markets and, through the growth of agglomerations, promote industrial specialization and ensure interaction between enterprises and skilled workers in high-value-added sectors.

In modern studies by economists, special attention is paid to the impact of transport infrastructure on the economic development of regions

and industry markets. An increase in the volume of transportation contributes to the accumulation of capital in the infrastructure and the efficient use of labor resources, which, in turn, helps reduce the cost of production. In addition, the growth in the number of jobs has a positive effect on the level of per capita income. Opening access to new markets helps increase labor productivity, which leads to an increase in real GDP per capita.

From the point of view of ensuring the economic security of regions, experts note the importance of geographical accessibility and development of transport networks for the integration of the regional market. This emphasizes the importance of transport infrastructure in the formation of a single regional transport space. [5]

The role of transport infrastructure in regional development is one of the fundamental principles in the theory of regional economics. This principle states that regions with better access to resources and markets due to developed transport links, all other things being equal, will be more productive, competitive and, as a result, successful compared to isolated regions. The development of transport infrastructure implies, first of all, the optimization of the share of various types of transport in the transport services market, which contributes to the increase in the efficiency of the economy in the regions. An important indicator of the level of development of the national economy is GDP, and for individual regions - the gross regional product (GRP). The volume of GRP depends on many socio-economic factors, including the level of development of the territorial transport system.

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УДК 004.912:613.2:796.015

О.В. Новик, А.О. Борисевич, В.О. Войтехович
Национальный детский технопарк
Минск, Беларусь

PROПИТАШКА: РАЗРАБОТКА ТЕЛЕГРАМ-БОТА ДЛЯ СОЗДАНИЯ ПЕРСОНАЛЬНОГО ПЛАНА ПИТАНИЯ И ТРЕНИРОВОК

Аннотация. *Современные технологии активно интегрируются в области здравоохранения и фитнеса, предоставляя пользователям доступ к персонализированным инструментам для поддержания здорового образа жизни. Данный проект представляет Telegram-бот под названием PROпиташка, который предоставляет пользователям простое и удобное средство для создания и поддержки персонального плана питания и тренировок.*

O.V. Novik, A.O. Borisevich, V.O. Voitekhovich
National Children's Technopark
Minsk, Belarus

PROPITASHKA: DEVELOPMENT OF A TELEGRAM BOT FOR CREATING A PERSONAL NUTRITION AND TRAINING PLAN

Abstract. *Modern technologies are actively integrating into the fields of health and fitness, providing users with access to personalized tools for maintaining a healthy lifestyle. This project presents a Telegram bot called PROpitashka, which provides users with a simple and convenient tool for creating and maintaining a personalized nutrition and training plan.*

Целью данной статьи является описание процесса проектирования и разработки Telegram-бота, поддерживающего