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**PROBLEMS OF THE EFFICIENCY OF THE FUNCTIONING
OF THE MARKET OF PASSENGER TRANSPORTATION SERVICES
IN THE CONDITIONS OF THE STATE OF WAR: IDENTIFICATION
AND WAYS OF OVERCOMING**

The article analyzes the challenges facing public transportation in the capital during the war and outlines potential development paths for the post-war period. It's crucial to note that assessing the performance of municipal transport enterprises is complex due to the threat of enemy shelling and their pre-war financial struggles. The development of an efficient urban public transportation system is a complex economic challenge that demands a rational selection of a transport market organization model. The chosen model will shape the level of competition, the attractiveness of the sector for investments, and ultimately, the quality and accessibility of transportation services, which are essential for the well-being of city dwellers. The article examines factors affecting service quality and the financial health of both municipal and private carriers, as well as approaches to interpreting economic efficiency and the passenger transportation market. It also investigates the decline in passenger traffic at Kyiv's public utilities, its underlying causes, and the war's impact on the transportation system. The "Recovery Plan of Ukraine," approved in 2022, specifically addresses the prospects for urban transport development. The text highlights that urban transportation was in a poor state even before the Russian invasion and that territorial communities now face the challenge of renewal, modernization, and overall reform. It emphasizes the need for legislative and regulatory changes at the local level to attract funding for post-war reconstruction. A multi-faceted evaluation of transportation enterprises' economic efficiency necessitates considering various financial, socio-economic, and operational factors, as well as the external factor of regional security. The analysis concludes that the unsatisfactory economic condition of municipal enterprises stems not only from wartime challenges

but also from mismanagement in the pre-war period. The primary priorities for restoring the urban transportation system should be comprehensive, consider socio-economic development factors, and align with the country's overall reconstruction plan.

Keywords: communal transport, reforms, electric transport, modernization, financing of post-war reconstruction, economic efficiency.

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ПРОБЛЕМИ ЕФЕКТИВНОСТІ ФУНКЦІОНУВАННЯ РИНКУ ПОСЛУГ ПЕРЕВЕЗЕННЯ ПАСАЖИРІВ В УМОВАХ ВОЄННОГО СТАНУ: ІДЕНТИФІКАЦІЯ ТА ШЛЯХИ ПОДОЛАННЯ

У статті аналізуються проблеми громадського транспорту столиці під час війни та окреслюються потенційні шляхи розвитку на післявоєнний період. Важливо зазначити, що оцінка діяльності муніципальних транспортних підприємств є складною через загрозу ворожого обстрілу та їхні довоєнні фінансові труднощі. Розбудова ефективної системи міського громадського транспорту є складним економічним завданням, яке вимагає раціонального вибору моделі організації транспортного ринку. Від обраної моделі залежатиме рівень конкуренції, інвестиційна привабливість галузі, зрештою, якість та доступність транспортних послуг, необхідних для добробуту мешканців міста.

У статті досліджено фактори, що впливають на якість послуг та фінансовий стан як муніципальних, так і приватних перевізників, а також підходи до трактування економічної ефективності та ринку пасажирських перевезень. Також досліджується падіння пасажиропотоку на комунальних підприємствах Києва, його основні причини та вплив війни на транспортну систему. «План відновлення України», ухвалений у 2022 році, зокрема стосується перспектив розвитку міського транспорту. У тексті наголошується, що міський транспорт був у незадовільному стані ще до російського вторгнення і що територіальні громади зараз стикаються з проблемою оновлення, модернізації та загальної реформи. Наголошується на необхідності законодавчих та нормативних змін на місцевому рівні для залучення коштів на післявоєнну відбудову.

Багатоаспектна оцінка економічної ефективності транспортних підприємств зумовлює врахування різноманітних фінансових, соціально-

економічних та операційних факторів, а також зовнішнього чинника регіональної безпеки. У результаті аналізу зроблено висновок, що незадовільний економічний стан комунальних підприємств зумовлений не лише воєнним часом, а й через безгосподарність у довоєнний період.

Першочергові пріоритети відновлення міського транспорту мають бути комплексними, враховувати фактори соціально-економічного розвитку та узгоджуватися із загальним планом реконструкції країни.

Ключові слова: комунальний транспорт, реформи, електротранспорт, модернізація, фінансування повоєнного відновлення, економічна ефективність.

Problem Statement. The role and importance of passenger transportation services in any city cannot be overstated. It is an integral part of the city's infrastructure strategy. Before the war, the urban transport of almost any Ukrainian city had an unsatisfactory financial and technical condition. This was caused by systemic underfunding of this sector, as well as the transition to a practice of servicing routes by private carriers. At the same time, the municipal transport sector plays not only an infrastructural role but also a social one, as it is used by a large number of people in privileged categories.

Analysis of recent publications. Today, there is a considerable number of publications by domestic scientists dedicated to studying the economic problems of the functioning of transport enterprises. In particular, scientific research concerns pricing, competition, sustainable development, and methodological approaches to assessing the efficiency of transport enterprises. Dmytrieva O.I. indicates that to increase the efficiency of transport enterprises, it is necessary to use a balanced system of indicators [3]. In the article by Nykyforak I.I., a methodology for analyzing transport enterprises based on five-level factors was proposed, which comprehensively reflects the level of transport service [7]. Aulin V.V., Golub D.V., Bilychenko V.V., and Zamurenko A.S. note in their work [2] that each subsystem of a vehicle fleet has its own goals, the most important of which is to ensure its own stability of operation in a competitive environment, which leads to self-organization of the system and, as a result, to increasing its reliability and efficiency. Palant O.Yu. took a comprehensive approach to the research and recommendations for modernizing the electric transport system in cities [8], which is an extremely important aspect within the framework of the socio-economic development strategy.

Unfortunately, the effectiveness of municipal transport operations during wartime and the foundations of its development in the post-war period have been studied quite insufficiently. Existing publications also do not sufficiently highlight the impact of institutional changes on the functioning of municipal transport, caused by the emergence of some new legislative acts regulating this area in modern conditions.

Unresolved Parts of the Problem. War actions have significantly worsened the economic condition of municipal transport enterprises. In addition, the problems that accumulated in the pre-war period are now becoming even more urgent and require immediate resolution, as they affect the performance of transport enterprises. The main problem remains the search for effective tools to support the economic efficiency of municipal transport operations now and to attract funds for its reform after the victory.

Research Methodology. The study employed a variety of research methods, including analysis and synthesis of theoretical frameworks, collection of primary and secondary data, statistical analysis, comparative analysis, and systems analysis of urban public transportation issues in Ukraine during the war.

The aim of this article is to investigate the key problems of the functioning of the transport market, to search for alternative management decisions to increase the economic efficiency of municipal transport in current conditions and its post-war recovery.

Research results. Modern enterprises constantly strive to increase the efficiency of their operations while minimizing costs and resource consumption. The ability to respond promptly to unforeseen situations and disruptions is critical for ensuring business sustainability. One of the key directions for achieving these goals is increasing the overall productivity of the enterprise, which involves optimizing the use of both human and material resources.

In the scientific literature, there are various approaches to defining the term "economic efficiency", but in most cases, the definition of this concept is based on considering the ratio of resources expended and results/effects obtained (economic or social). The founders of any enterprise usually plan to obtain a profit as a result.

Assessing the economic efficiency of urban transport is a multifaceted task that requires the integration of various factors and indicators. The efficiency of urban transport should be considered from the perspective of several stakeholders: from the viewpoint of the transport enterprise, the municipal administration, and the passenger.

The perspective of a transport enterprise when assessing efficiency focuses on financial indicators such as profitability, the cost of transportation, and the efficiency of resource utilization. From the city's perspective, social and environmental aspects are important, including transport accessibility, the level of environmental pollution, and the impact on urban planning. Passengers evaluate transport based on criteria such as comfort, speed of transportation, and fare. In particular, Dmytrieva O.I. notes in her work that one of the modern approaches to assessing efficiency is the Balanced Scorecard, which is a system of strategic management of an organization based on the measurement and evaluation of its performance according to a list of indicators selected to take into account all significant aspects of the organization's activities [3].

Traditionally, key performance indicators of urban transport cover three groups:

- Financial indicators: profit, return on investment, cost per passenger-kilometer.
- Operational indicators: passenger flow, speed of movement, vehicle utilization rate, waiting time at a stop.
- Socio-economic indicators: impact on road congestion, emission levels, accessibility for different population groups.

Analysis of existing research [2,3] shows that the most common methods for assessing efficiency in this area are:

- Financial analysis: analysis of the enterprise's financial statements.
- Passenger surveys: collecting data on satisfaction with services.
- Observation: measuring speed of movement, headway, vehicle occupancy.
- Modeling: using mathematical models to forecast demand and evaluate the effectiveness of different scenarios.
- Comparative analysis: comparing indicators with other cities or transport systems.

The application of specific methods for assessing efficiency is closely correlated with the characteristics of the urban transport system, and the selection of particular indicators for its measurement is determined by the evaluation objectives. Among the factors that most significantly influence the efficiency of urban transport, the following should be highlighted:

1. **Type of transport:** buses, trams, metro.
2. **Route network:** route density, route length, number of transfers.
3. **Schedule:** headways, operating hours.
4. **Fares:** fare.

5. Infrastructure: condition of roads, stops, depots.
6. Technical condition of rolling stock: age, mileage.

The organization of urban passenger transportation is a complex task that requires a balanced approach to choosing a market model. The choice of a model directly affects the efficiency of the transport system, the accessibility of services for the population, and the overall standard of living in the city.

There are several main models of urban passenger transportation organization, each of which has its own characteristics, advantages and disadvantages:

- Fully State-Controlled Model. Characterized by centralized management of all aspects of the transport system. Advantages of this model include the ability to ensure social justice and accessibility of transport for all segments of the population. However, it is often accompanied by low efficiency, bureaucratic barriers, and a lack of incentives to improve services.
- Free Market Model. Based on the principles of competition, where carriers independently determine routes, fares, and service quality. This model stimulates innovation and adaptation to changing demand but can lead to an uneven distribution of transport services, ignoring social aspects and market monopolization.
- Public-Private Partnership Model. Involves cooperation between government agencies and private companies. The state sets general rules and monitors the fulfillment of contracts, while private companies carry out direct transportation. This model combines the advantages of state regulation and market competition but requires complex coordination and control mechanisms.
- Regulated Market Model. Combines elements of state regulation and market competition. The state sets certain standards and norms, while carriers have some freedom in determining their strategies. This model allows for a balance between economic efficiency and social needs.

A study of the structure of the passenger transport market in Kyiv shows that, in terms of ownership, it is divided into the following segments: municipal, state, and private. Municipal and state transport is most in demand due to its low prices and accessibility. The advantages of private transport for passengers include comfort, frequency of service, and speed.

A common drawback of both the municipal and state segments of the passenger transport market is the high degree of wear and tear of fixed assets, which is complemented by a decrease in demand for public transport.

The armed aggression of the Russian Federation has fundamentally changed the principles of operation of municipal transport enterprises. Under constant shelling, carriers have faced not only a decrease in passenger traffic but also the destruction of vehicles, production and administrative premises, and other problems.

Therefore, a priority task now is to facilitate the normalization of municipal enterprises and develop effective models for their post-war recovery, attracting additional funding, preserving jobs, etc. The issue of the country's European integration, creating appropriate conditions, and reforming legislation should be considered separately. In the context of these tasks, it is appropriate to mention that the "Recovery Plan for Ukraine" was approved in 2022. Given the current state of passenger transportation in Ukrainian settlements and their suburbs, the destruction of infrastructure, and the destruction or damage of buses, trolleybuses, trams, metro cars, etc., as well as the blocking of the operation of urban electric transport as a result of the Russian Federation's armed aggression, the issue of the need for a comprehensive solution to the problems of the stable functioning of the network of urban and suburban routes has become acute [8].

Overall, until the beginning of the military aggression, passenger transportation could be considered profitable. According to statistics, enterprises in this field were mostly profitable (72-74% of enterprises during 2018-2021) [4].

However, today, considering the specific number of passengers transported by municipal transport in the capital, we see a sharp decrease (Fig. 2), caused by a number of factors.

In Ukraine in the pre-war period, it was precisely automobile transport that was key in passenger transportation. In 2021, its share in the provision of services, compared to trolleybuses and trams, was the highest (Figure 1.1).

Based on the data presented in Figure 2, we observe a sharp decline in the number of passengers in 2020 and 2022. The main reasons for the decrease in passenger traffic during this period were the following:

1. Restrictive measures caused by the spread of infectious diseases;
2. A decrease in the population due to hostilities;
3. A reduction in the number of vehicles on routes;
4. A decline in the quality of transportation services.

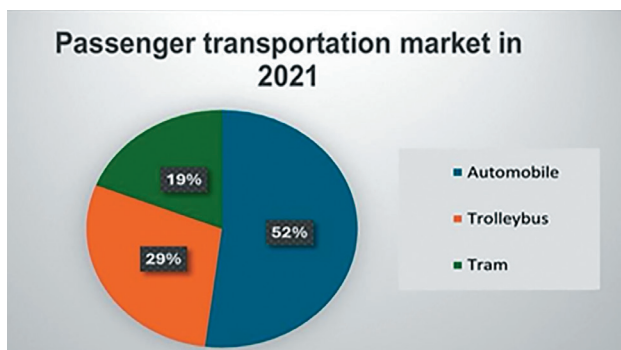


Figure 1. Distribution of the number of passengers transported in 2021 by mode of transport [4]

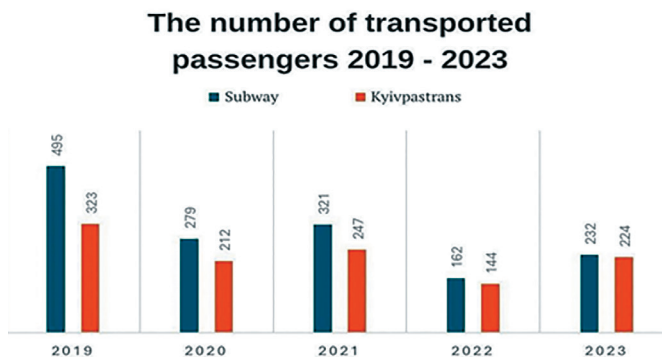


Figure 2. Number of passengers transported by Kyiv's public transport (in millions)

In 2021, 19 private carriers operated 147 routes in Kyiv, and the number of vehicles was 1,424. Unfortunately, detailed statistics on the number of passengers carried by private carriers are not available, but it can be assumed that it also decreased in 2022 due to the start of the full-scale invasion.

During the war, the city transport suffered massive losses. In 2022 alone, about 25 transport infrastructure facilities were destroyed or

damaged in Kyiv. The martial law also delayed the receipt of credit funds for the purchase of new trolleybuses and metro cars by almost 2 years. In addition to the material losses caused by the enemy, at the end of 2023, the tunnel between the stations "Lybid'skaya" and "Demiyiv'ska" of the blue metro line was closed. This situation not only negatively affected the operation of the metro but also reduced the quality of work of KP "Kyivpastrans", as about 75 buses were involved to provide duplicate routes between the metro stations "Terekmy" and "Lybid'skaya", which were removed from other routes.

The martial law has inflicted significant damage on the material and technical base of municipal enterprises. In addition to the existing objective limitations on the formation of revenue from passenger transportation, the Kyiv City Defense Council has made a decision to suspend the operation of public transport during air raids, except for underground metro stations. This, in turn, leads to a decrease in revenue from the provision of services.

The "Ukraine Recovery Plan" adopted in 2022 has a separate section - "Restoration and Development of Infrastructure" [11], where, among the sectors, automobile, urban electric transport, roads, and road economy are highlighted, as well as the sphere of strategic initiatives of transport infrastructure.

In the field of automobile, urban electric transport, roads, and road economy, the document in question highlights the creation of an urban electric transport network and bringing legislation into line with European standards as one of the conditions for Ukraine's European integration. However, given the current state of the aggressor's shelling and the destruction of Ukraine's energy infrastructure, the implementation of this direction will be complicated. The development of electric charging stations is considered separately. These issues must now be combined with the issues of energy development, namely ensuring a comprehensive transition of the state to renewable energy sources. The conversion of the automobile part of public transport to electric motors will lead to a significant increase in costs, since, as mentioned above, this is the most popular type of transport among passengers.

In addition to the urgent need for a radical reform of urban public transport, there are a number of other challenges, including:

- The unprofitability of enterprises, namely the lack of sufficient revenues to municipal budgets and the impossibility of fully subsidizing this area;

- An insufficient level of transport inclusivity. Given the increase in the number of people with disabilities caused by the Russian Federation's military aggression, this may become the main challenge of the urban transport sector.

The document outlines a number of promising perspectives for the development of electric transport:

- Comprehensive reform of urban and intercity transportation, ensuring adequate quality;
- Introduction of environmental standards;
- The possibility of creating automated traffic management systems;
- Creation of infrastructure for personal electric vehicle owners, which will help increase revenues to local budgets;
- Development of new payment models (Public Service Contracts);
- Integration of urban and suburban transport systems of various types, including the creation of transport hubs (a system of free transfers, the creation of a single ticket, the construction of interchanges).

Implementing a recovery strategy is currently only possible in certain cities in western Ukraine. Due to the ongoing war, there are significant resource and methodological constraints. In particular, it is impossible to objectively assess the extent of the destruction, which may occur every day.

It should be emphasized that even during wartime, the city is restoring the operation of transport infrastructure and is concerned about the efficiency of transportation. In the Kyiv budget for 2024, the largest amount of funds is allocated to the Department of Transport Infrastructure, namely over 30 billion UAH. This is mainly for the reconstruction of roads, completion of construction of large infrastructure projects, compensation for the difference in tariffs, and more. In 2024, it is planned to attract more than 200 million euros for the purchase of new and reconstruction of rolling stock for the metro and trolleybuses.

It should be noted that the Government is also aware of the danger of the current state of urban public transport. On November 4, 2022, the Cabinet of Ministers of Ukraine adopted Resolution No. 1248 "On Certain Issues of Financial Support for the Operation of Road Infrastructure and Transport Infrastructure during Martial Law".

The issue of post-war financing of the reform of public transport remains unresolved. Ukraine currently needs a new version of the Marshall

Plan, which would help to carry out a multi-level reform of the economic system and also give impetus to Ukraine's Euro- Atlantic integration. Today, one of the tools that could be used in post-war reconstruction is the issuance of targeted municipal bonds or local bonds.

Conclusions. Key indicators for assessing the economic efficiency of transport enterprises include financial, socio-economic, and operational factors. When studying the state of enterprises, it is necessary to evaluate all of the above indicators and take into account the security situation in the region. It is important to note that the assessment should be comprehensive.

Based on the conducted research on the operating conditions of Kyiv's public transport during the war, critical aspects of passenger transportation efficiency, and the study of possible options for its post-war development, the following conclusions can be drawn:

1. The difficult state of public transport is caused not only by the challenges of war but also by its weak development in the pre-war period.
2. The reform of urban transport after the war should be carried out taking into account environmental standards, the creation of a new management model, and the development of electric transport infrastructure.
3. It is necessary to overcome the unprofitability of public transport through cost optimization, improving the quality of services, and creating a unified system of urban and suburban transport.
4. The need to restore the transport network as a whole can only be assessed after the end of the martial law.

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