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WAYS TO DEVELOP AN EFFICIENT URBAN PASSENGER TRANSPORT SYSTEM

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The low efficiency of urban passenger transport in Ukraine is caused by a lack of funding necessary for its proper operation, which, in turn, results from broader economic challenges. This situation is further aggravated by the high proportion of vehicles operating beyond their standard service life, alongside an almost complete lack of resources for their renewal. Under such conditions, private carriers have become more active, entering the market with vehicles of various brands, mostly with low passenger capacity. As a result, high-speed bus services have nearly disappeared. The most widespread form of passenger transportation has become route taxis, which mostly operate alongside existing urban public transport routes. Methods of organizing route operations include combined transport modes and various vehicle dispatching

schemes, which help to increase route capacity, improve the quality of transport services, consider the population's solvency, and reduce the costs of transport companies.

Despite the application of many known methods for organizing bus traffic, the optimal conditions for their use remain undefined. There is a lack of methodological recommendations for their implementation, and some approaches still lack sufficient scientific justification. The concept of efficiency in urban passenger transport systems is multifaceted and encompasses various aspects. Given the specifics of urban transportation, it is advisable to distinguish between economic, environmental, and social components of efficiency [1–2].

A comprehensive analysis of the problem requires an in-depth study of the concept of «efficiency». In scientific literature, the terms «effect» and «efficiency» are treated as separate categories with distinct meanings. A review of academic sources reveals the absence of a unified approach to interpreting the concept of efficiency, as well as a lack of clear classification of its evaluation criteria. In the works of both domestic and foreign researchers, efficiency is often considered as the ratio of achieved results (effects) to the volume of limited resources used, as well as the degree to which stated goals are achieved.

Road transport occupies a leading position among all types of urban passenger transportation. In large cities, it operates as part of an integrated transport system that includes multiple types of public transport, while in smaller cities it often serves as the only means of transportation, contributing to the integration of different districts into a single urban space. Meeting the population's needs for comprehensive, timely, and high-quality passenger transportation not only improves working and living conditions but also serves as a key element in the development of the country's technological and economic potential.

A significant portion of travel time is spent waiting for transport, so reducing this waiting period is one of the internal reserves for optimizing the transportation process and improving the quality of transport services. The further development of urban route transportation is hindered by insufficient attention to the operational management of

the transport system.

Existing scientific methods for evaluating and reducing passenger waiting times are primarily focused on planned management and do not fully account for real-time operating conditions of vehicles on the route. This limits the potential to reduce waiting times using tools for the dynamic management of transport process parameters [1–2]. Various criteria and indicators have been proposed in academic studies to evaluate the efficiency of urban passenger transport systems. However, it is emphasized that using a single criterion or indicator does not allow for a comprehensive assessment. The level of transport service is often considered the primary efficiency criterion. Key performance indicators include technical-economic and technical-operational characteristics, such as the cost of transportation and the performance of the transport system. These efficiency criteria represent the quantitative and qualitative expression of the goal of providing transportation services to the population.

Passenger-hour cost estimation is inherently conditional and averaged, as it involves numerous factors whose actual values are difficult to determine due to the individual perception of time value by each member of society. However, using the passenger-hour cost as a criterion for social efficiency enables economic justification for introducing higher-cost transport options that reduce travel time. This provides society with maximum benefits from faster transportation and allows for the quantitative assessment of socio-economic losses resulting from the mismatch between the transport system's capacity and the population's mobility needs [2–3].

Studies dedicated to this issue highlight key factors hindering the development of the urban passenger transport system [2–3]. These include: the unfinished structural reform of the sector; chronic unprofitability of urban transport enterprises due to inadequate compensation for transporting preferential passenger categories; lack of state funding for fleet renewal, and others. Problems ensuring the regular operation of urban passenger transport are also discussed. Solving these issues would foster stable interaction among participants and enable timely responses to changing needs. The solution lies in the implementation of public policy measures, including targeted budget subsidies, preferential taxation for transport companies, effective tariff

regulation, and income management.

Under current conditions, the efficiency of Ukraine's urban passenger transport system is determined by a complex set of systemic problems that have accumulated over the years and now significantly hinder its stable and sustainable development. Chief among these issues are persistent economic instability at both national and regional levels, which reduces the financial capacity of local governments and transport operators to maintain and develop transport infrastructure. Additionally, the advanced moral and physical depreciation of the vehicle fleet has led to reduced reliability, safety, and comfort of passenger transport services. A chronic shortage of government funding exacerbates the inability to renew rolling stock, implement modern technologies, or support sustainable planning and management practices. Furthermore, there is a notable absence of a unified and coherent regulatory and methodological framework that would enable the development and optimization of transport processes based on objective data and strategic planning. These conditions have led to the dominance of private carriers using mostly outdated, low-capacity vehicles operating in parallel with municipal routes. This uncoordinated competition contributes to the degradation of high-speed, high-capacity public transport services, which have nearly disappeared from many urban areas due to financial unsustainability and lack of investment.

The evaluation of urban passenger transport performance must be based on a multifactorial and comprehensive approach that reflects the interdisciplinary nature of the transport system and its impact on urban life. This evaluation should simultaneously consider economic efficiency (e.g., operating costs, profitability, resource use), social relevance (e.g., accessibility, affordability, equity), and environmental sustainability (e.g., emissions, energy efficiency, urban space usage). The level of transport service is proposed as the central criterion for assessing system effectiveness, encompassing indicators such as vehicle dispatch frequency, adherence to schedules, coverage of urban areas, and integration with other transport modes. Among the key quantitative indicators, particular attention should be paid to the cost of transportation per passenger-kilometer, vehicle and route productivity, and the cost of

passenger time, often measured in terms of passenger-hours. The latter is especially valuable for assessing social and economic losses caused by excessive waiting times, travel delays, or insufficient coverage. A high passenger-hour cost reflects inefficiencies in service provision and underscores the urgency of reforming route networks, schedules, and operational strategies to better align with real-time mobility demand.

The formation of an effective and resilient urban passenger transport system in Ukraine requires the implementation of a comprehensive and coordinated approach that addresses technical-economic, social, organizational, and regulatory dimensions of transport policy. Among the strategic priorities should be the modernization and diversification of the vehicle fleet, including the introduction of energy-efficient and environmentally friendly vehicles; the development of intelligent transport systems (ITS) capable of supporting real-time monitoring, dispatching, and demand-responsive management; and the introduction of legislative instruments to regulate and balance the interests of public and private operators. Furthermore, mechanisms for evaluating efficiency should be reoriented to prioritize social value, with a particular focus on improving service accessibility, reducing travel time, and ensuring the comfort and safety of passengers. In this context, attention to the time valuation of passengers enables a more accurate assessment of the true socio-economic benefits of public transport improvements. Ultimately, a transport system that prioritizes quality of service, sustainability, and adaptability will contribute significantly to urban development and to meeting the evolving mobility needs of the population and economy.

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3PL AND 4PL OPERATORS: HOW THE ROLE OF LOGISTICS INTERMEDIARIES IS CHANGING

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Today, logistics plays a key role in the functioning of the economy, as it ensures the efficient movement of goods, services and information in a globalised market. As globalisation spreads and consumers' expectations of speed and quality of service grow, the importance of logistics is becoming even more important. The increasing complexity of supply chains is forcing businesses to turn to professional logistics intermediaries more and more often. This allows them to focus on their core business, optimise costs and strengthen their competitive advantage.

Under the influence of modern business environment challenges, such as digitalisation, the growing need for flexibility and adaptability, traditional logistics models are gradually changing and modernising. New formats of logistics services are gradually emerging that take these changes into account. Among them, a special place is occupied by third-party (3PL) and fourth-party (4PL) operators, which assume different levels of responsibility for logistics processes. Particular attention should be paid to how the role of these intermediaries in modern logistics is transforming in the context of digital innovation and global change.

3PLs (Third Party Logistics) are companies that provide services for managing individual logistics processes, such as transportation, storage, cargo handling, and distribution. This approach allows companies to outsource some of their operational tasks to an external contractor, which is especially important when resources are