

A CURRENT STATE REVIEW OF THE THEORY AND PRACTICE FOR THE IMPROVING QUALITY OF THE URBAN POPULATION TRANSPORT SERVICES

*Litynskyi M.V., Postgraduate Student
Kharkiv National Automobile and Highway University, Ukraine*

Urban passenger transport (UPT) is the most important component of the territorial structure of the economy and significantly affects the socio-economic and material-spatial development of the city of Kharkiv. The problem of improving the quality and efficiency of UPT work has an important economic significance and concerns not only technical and economic aspects, but also affects the social conditions of the development of the urban environment to no small extent. Urban passenger transport, which satisfies the needs of the population for movement, creates conditions for the normal functioning of the city's economy and contributes to the increase of people's free time, giving them the opportunity to use the services of territorially distributed connections of the industrial and social structure of the regional economy [1-4].

Political and socio-economic reforms, which have been actively implemented recently in Ukraine, led to radical structural changes in all spheres of activity, and did not bypass the sphere of passenger transportation by road transport. The processes of democratization of society and liberalization of the economy objectively contribute to the disclosure of the huge potential possessed by passenger road transport. But in conditions of limited resource capabilities of transport enterprises, high energy intensity of the transport process and a high concentration of population in the city of Kharkiv, quite serious problems appear in ensuring the main functions of urban road transport.

In recent years, there have been significant changes and difficulties in the work of the UPT in Kharkiv. The first challenge occurred in 2020 and is related to the introduction of strict quarantine restrictions during the coronavirus pandemic. At that time, the subway did not work for 2.5 months, and ground transport worked with significant restrictions. This led to a significant reduction in the volume of services provided and a decrease in the economic efficiency of the UPT. During 2021, the state of UPT work gradually improved, but according to general statistics, the demand for transportation in the cities of Ukraine was within 70-80% of the volume of transportation that was in 2020.

After the start of martial law in 2022, the work of the UPT in Kharkiv was almost completely blocked. The metro was used as a shelter from shelling, a large part of ground transport routes was stopped. Starting from the fall of 2022, the work of the UPT in the city of Kharkiv began to resume. Table 1 presents information about the current and previous state of the used rolling stock fleet of the Kharkiv UPT.

Table 1 – Condition of the rolling stock fleet of UPT of Kharkiv

Indicator	Subway	Trolleybus	Tram	Bus
2021				
Number of routes (lines)	3	29	10	107
Total length of routes, km	37,6	284	231	556
Number of vehicles	321	224	252	875
2022				
Number of routes (lines)	3	25	7	47
Total length of routes, km	37,6	261	183	346
Number of vehicles	315	142	160	203
2023				
Number of routes (lines)	3	30	8	60
Total length of routes, km	37,6	287	197	408
Number of vehicles	312	181	165	445

According to the data given in Table 1.1, it is possible to plot changes in the transport offer of the UPT in the period from 2021 to 2022. Figure 1 shows data on the change in the number of routes (lines) of the UPT, and Figure 2 shows the change in the number of vehicles.

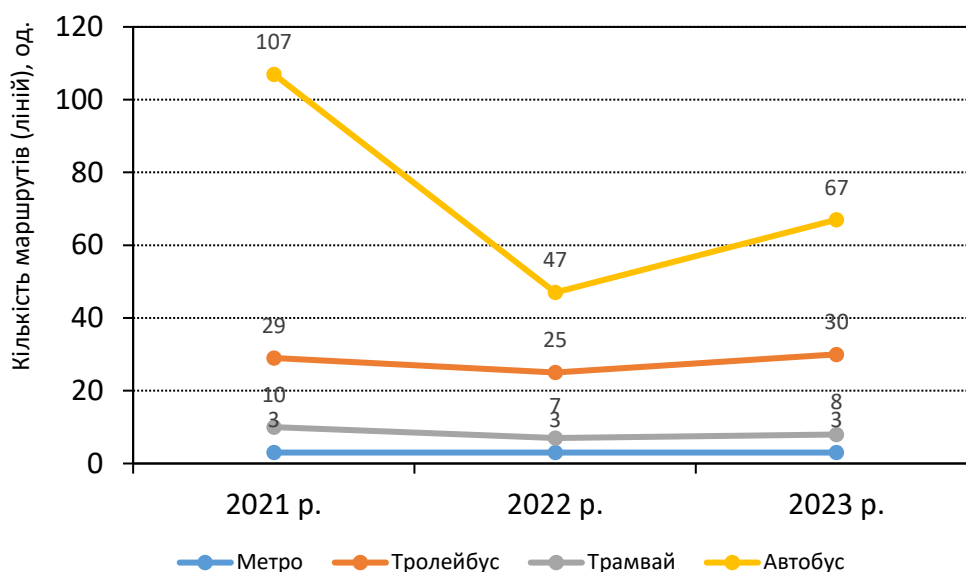


Figure 1 – Change in the number of routes (lines) of the Kharkiv public transportation network

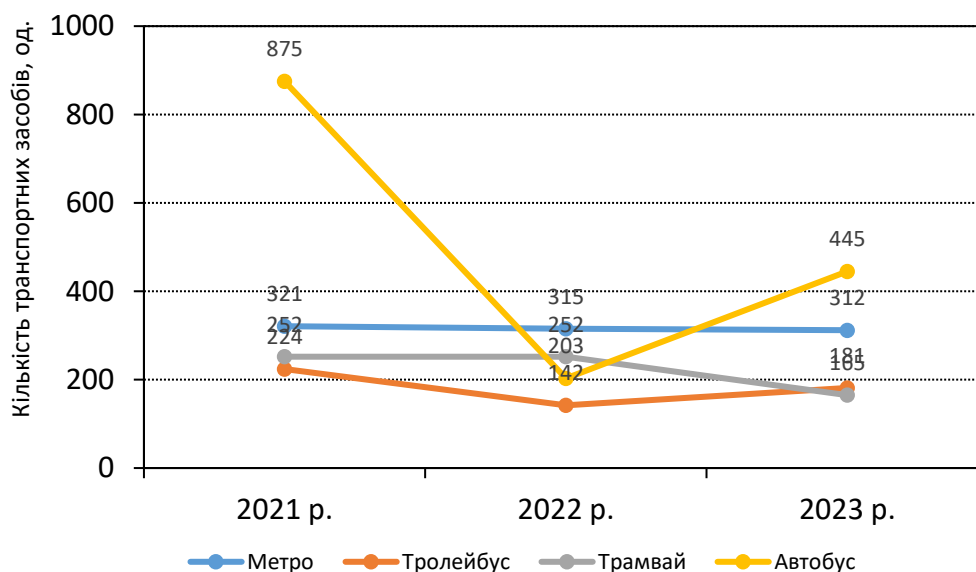


Figure 2 – Change in the number of rolling stock of UPT in Kharkiv

As can be seen from the figures, in the period 2021-2023, there was a significant reduction in the transport supply: trolleybuses – by 43 units. (37%), tram – by 87 units (35%), buses – for 430 units. (49%), the subway - by 9 units. (3 %). The number of routes has also decreased. This was especially evident in the bus service, which is caused primarily by the lack of sufficient capacities of carriers on the transport services market of Kharkiv.

A wide range of current directions of research into urban passenger transport systems is justified by the complexity and uncertainty of the operating conditions of urban passenger transport,

especially in conditions of a significant economic crisis. The current state of Ukraine's economy requires new approaches to determining the social quality of passenger transportation. The purpose of the effective functioning of the modern UPT is to ensure a high level of service quality of transport services while ensuring the rational use of resources and limiting its negative impact on the urban environment. This form of presentation of requirements for UPT fully corresponds to the conditions and principles of sustainable development, which are specified in the updated EU development strategy as a guarantor of the satisfaction of economic, social and environmental needs of society by transport systems. The problem of ensuring a sustainable UPT is gaining wide interest and requires the selection of forms of its presentation, the development of modern methods and principles of its formation, the creation of methods for evaluating its effectiveness and mechanisms for its improvement.

A condition for ensuring the quality of living of the population in the urban environment is the implementation of a high level of all types and forms of social services. Representation of urban passenger transport in the form of a socio-economic system allows to distinguish and form such a concept as passenger transport service, which can be attributed to social categories. The passenger transport service significantly affects the social component of the living conditions of the city population and is part of the structure of the social institute system, which is designed to meet the most important needs of the social development of the city.

The result of the operation of the UPT is transport services related to the timely and high-quality satisfaction of the needs of the population in the implementation of their spatial movement. The nature of the complexity of the socio-economic sphere of the city, the level of development of its transport infrastructure and resource capabilities of UPT transport enterprises has a clearly expressed correlation effect on the efficiency of the transportation process and largely determines the possibility of ensuring the appropriate conditions for the sustainable development of the urban environment. At the same time, for a successful solution to the problem of ensuring the effective functioning of the UPT, it is important to take into account the peculiarities and differences of all types of interests of the participants of the transport process, which largely determine the basic concept of the formation of directions for increasing its efficiency and achieving the socio-economic goals of its work set by society.

The basic level of studying the effectiveness of the UPT from the standpoint of the system approach is the selection of the first level of its formalization, at which the UPT is presented in the form of a simple structure that is subordinated to the achievement of the target goal of its operation - ensuring the quality of public transport services. The implementation of such a concept of presenting the system efficiency of UPT allows to form a direction of research devoted to the solution of one of the important areas of improvement of UPT - improving the service quality of passenger transport services. The concept of service quality of passenger transport services has a complex structure and uncertainty, which require its formalization and conducting research on the selection of composition and forms of parameterization of its evaluation indicators.

References:

1. Вакуленко К. Є., Харченко В. Ф. Щодо якості перевезень на маршрутах міського пасажирського транспорту. *Восточно-Европейский журнал передовых технологий*. 2012. №4(57). С. 57-59.
2. Bashynska I., Biskup V., Kuz'kin O., Hryzovska L., Shapoval G. Improving Management Decisions in Urban Passenger Transport Based on the Sociological Study. *International Journal of Industrial Engineering and Production Research*. 2020. Vol. 31. No. 4. P. 491-498.
3. Віниченко В. С., Тарасюк І. Ю. Аналіз факторів і умов, які впливають на якість пасажирських перевезень на міському пасажирському транспорті. *Коммунальное хозяйство городов*. 2011. №99. С. 369-374.
4. Воліков В.В., Вдовиченко В.О. Транспортна інфраструктура Харкова (аналіз та основні тенденції). *Бізнес Інформ*. 2017. №12(479). С. 292-299.