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CONDUCTING A SOCIOLOGICAL SURVEY TO IMPROVE TARIFF POLICY IN URBAN PASSENGER TRANSPORT

Iryna Bashynska
Department of Accounting, Analysis and Audit, Odessa National Polytechnic University, Odessa, Ukraine

Olexiy Kuz'kin
Department of Transport Technologies, "Zaporizhzhia Polytechnic" National University, Zaporizhzhia, Ukraine

Vitalii Biskup
Department of Psychology and Social Work, Ternopil National Economic University, Ternopil, Ukraine

Ganna Shapoval
Department of Railway Stations and Junctions, Ukrainian State University of Railway Transport, Kharkiv, Ukraine

ABSTRACT

The study is devoted to improving the quality and tariff policy in urban passenger transport. An analysis of the Ukrainian transport industry showed that passenger traffic in public transport had been steadily declining over the past six years (passenger traffic of trams, on average, by 4% annually, trolleybuses - by 2.9%), which is a negative trend and is primarily associated with an increase in personal cars. This leads to massive traffic congestion, conflict situations, an increase in travel time to and from work, an increase in air pollution, a loss-making transport system, etc. The study of theoretical issues allowed us to formulate three hypotheses that the authors tested empirically - conducted a sociological survey of the opinions of existing and potential users, which allowed us to identify which factors are decisive when choosing whether to use public transport. As a result of the study, all hypotheses were confirmed, but two of them were adjusted. The study showed that passengers are not ready for a significant increase (3-4 times) in the cost of a ticket, but are willing to pay more for a ticket with increased safety and comfort in public city transport; passengers are more likely to use urban public transport more often if it meets their requirements, but there is a category of drivers who under no circumstances will abandon their cars. Based on this, recommendations were developed regarding both the improvement of the tariff policy and the general issue as a whole.

Key words: sociological survey, tariff policy, urban passenger transport (UPT)

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1. INTRODUCTION

A key point in the transformation of society is the rethinking of cities as smart cities, which includes the development of intelligent transport systems as the leading service on which all other services rely. Social protection and ensuring the rights of citizens is an essential task of the government, because in the system of legal relations of economic entities, end consumers and state organizations, the latter act as a guarantor of the quality of services provided to consumers, controlling the activities of private enterprises. Employees of the transport industry of our region are faced with the priority task of adapting the city's transport network to current conditions.

The city's transportation system is an essential area of life in a big city. Effective management of the city's transport system ensures sustainable economic and social development of society. Previous studies by the authors (Bashynska 2017; Bashynska et al. 2020) have shown that there are many unresolved issues regarding urban passenger transport. The increase in the costs of maintenance and operation of road transport, the rise in the number of road transport in the cities of Ukraine, the rise in passenger traffic poses new challenges to regional and local authorities, which require modern approaches to the management of urban transport and performs one of the most critical functions of economic development of territories. In this regard, the issues of improving the mechanism of tariff and compensation system management of the city are becoming relevant.

The purpose of the study is to conduct a sociological survey and the results of the formation of theoretical and methodological principles and practical recommendations for improving tariff policy in urban public transport.

2. LITERATURE REVIEW

Scientists are exploring all aspects of the functioning of passenger transport. In the future, we will analyze individual works of scientists that directly affect the research methodology. Now, due to the significant number of studies by both foreign and Ukrainian authors, we consider it desirable to combine them in areas and highlight the results of their research:

- the use of modern means of passenger transport control, including with the help of artificial intelligence (Korczak and Kijewska 2016; Mathisen 2016; Kalieva and Karelin 2019);
- the efficiency of urban passenger transport (Zhenyu et al. 2012; Mikušová 2018; Nash 2019; Niemyi 2019);
- risks of the functioning of urban passenger transport systems (Kiselyov and Dolia 2020);
- the development of eco-efficient infrastructure (Wu et al. 2011; Dalkmann and Sakamoto 2012; Wang et al. 2015; Kwon et al. 2020);
- the planning of urban passenger transport (Dyachkova and Rigova 2015; Nikolaev et al. 2017; Rayushkina et al. 2017; Bratu and Boroiu 2019; 2019; Bohachenko 2019; Varga et al. 2020);
- subsidization of passenger traffic (Nash and Smith 2020) and so on.

By combining the research results, we can draw such conclusions that affect the research methodology regarding the improvement of the tariff policy in urban passenger transport:

- should not be fragmented, but be complex and targeted (Podbreznik et al. 2017; Petrenko 2019);
- the need to create an efficient transport system to comply with bus intervals on routes (Palach 2014; Kolbachev et al. 2019; Bogumil and Duque, 2020; Lunke 2020);
- make public transport an attractive alternative to car use (Lunke 2020)
- it is necessary to study the demand for public transport and the influence of factors that can change it (Bratu and Boroiu 2019; Galkin et al. 2019; Nash 2019; Ingeborgrud 2020).

Following the purpose of the work and analysis of the literature, a set of the following tasks was determined:

- to analyze the transport industry of Ukraine;
- to investigate the theoretical and methodological principles of tariff policy formation in urban public transport;
- to conduct a sociological survey to identify factors influencing tariff policy in general;
- to develop recommendations for improving tariff policy.

3. METHODOLOGY

Scientific research is considered in continuous development and is based on the connection between theory and practice. For clarity, the research methodology is shown in Fig. 1.

At the first stage of scientific work, the research is conducted in the theoretical direction. The tasks of this stage are solved by observation, measurement and description. Theoretical tasks were aimed at studying and identifying the causes, connections, dependencies that allow to establish the behaviour of the object - the process of forming a modern model of urban passenger transport, determine and study its structure, characteristics based on scientific principles and methods of cognition. Here the use of axiomatic methods, system, structural-functional analysis, mathematical modelling prevails. The study begins with a survey of the theoretical aspects of the management of the tariff policy of public passenger transport. Since the review of tariff policy alone will be incomplete, it is necessary to conduct comprehensive analysis following the objectives of the study.

As a result of the received knowledge, scientific and theoretical-methodical approaches are formulated, theories (in the form of hypotheses) are developed, facts are checked, etc. Theoretical cognitive problems are formed in such a way that they can be tested empirically. After the hypotheses are put forward, their empirical testing is carried out, namely the survey of residents of Ukrainian cities (internally – Kharkiv, Kyiv, Odesa, Ternopil, Zaporizhzhia), online - all cities of Ukraine. After the study, their results are analyzed, and the hypotheses are adjusted, which can give the following results: 1. The hypothesis remains without exaggeration; 2) the hypothesis is corrected; 3) the hypothesis is rejected as unconfirmed.

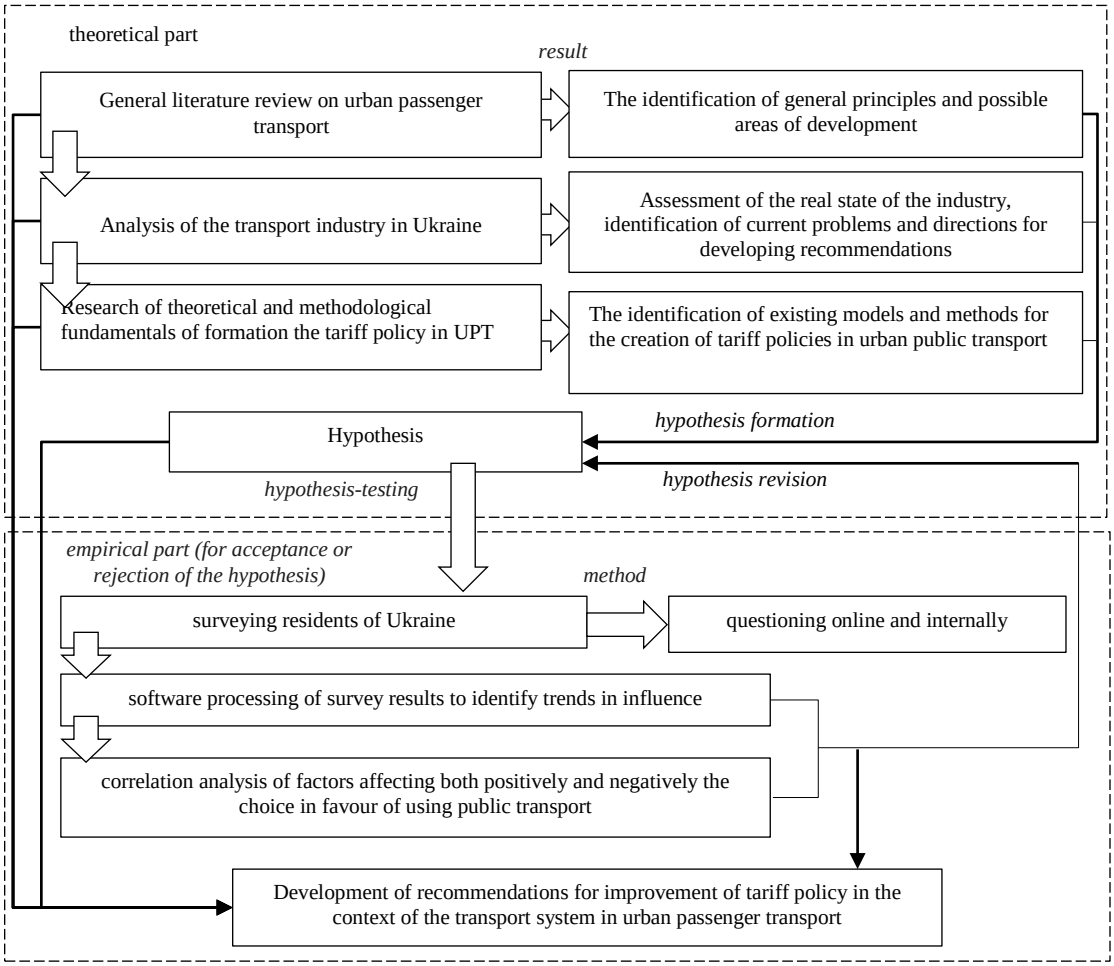

Figure 1 The schema of the methodology (source: developed by authors)

At this stage, the logical method of cognition prevails, which allows based on inferences to explain phenomena and processes, to provoke various proposals and ideas, to establish ways to solve them. It is based on the obtained facts and results of empirical research.

The data obtained were processed using correlation analysis (according to Spearman) and factor analysis (the method of principal components with varimax rotation). We used a computer program for processing data PSPP.

4. THEORETICAL PART

4.1. Analysis of the Transport Industry in Ukraine

The transport sector is one of the most critical areas of social production and is designed to meet the needs of the population and production. This industry in the economy has a wide range of competitive players, but each of the modes of transport plays a role in the market of transport services.

Trams and trolleybuses operate in 53 cities of Ukraine; they provide a significant share of intercity passenger traffic. Therefore, it is necessary to analyze the dynamics of transport (Fig. 2).

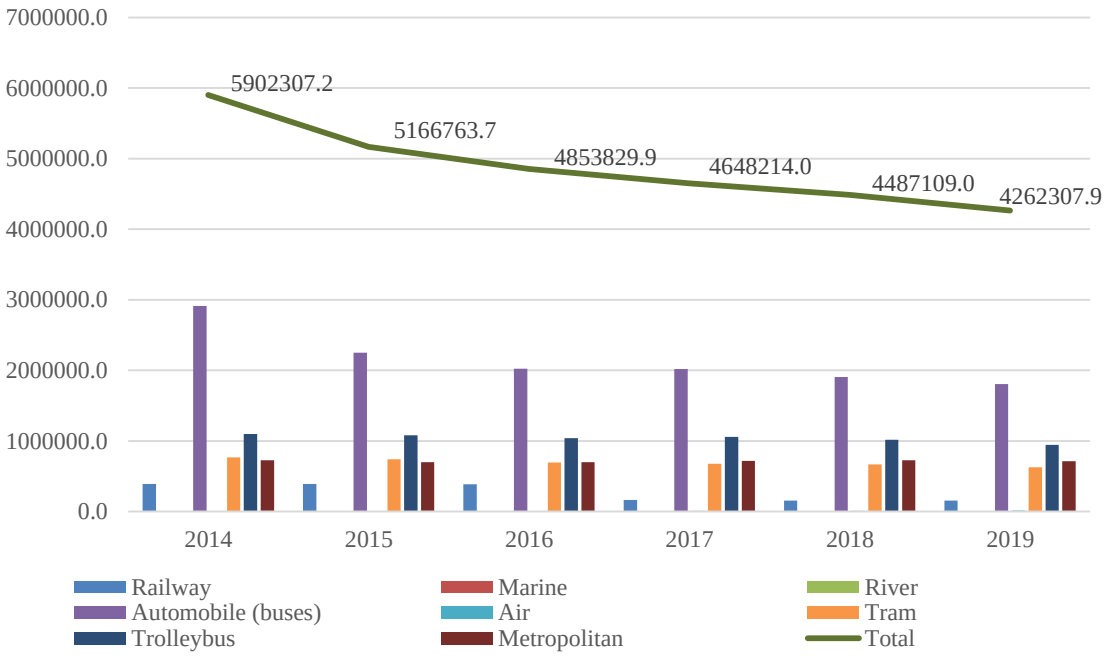

Figure 2 Transportation of passengers in 2014-2019, million passengers (source: developed by authors based on official statistics [The State Statistics Service of Ukraine])

The figure shows that passenger traffic is decreasing every year – in 2015 the decline in passenger traffic was 12.5% (compared to the previous year), in 2016 – 6.1%, in 2017 – 4.2%, in 2018 – 3, 5%, in 2019 - 5.0% (compared to the previous year) and 27.8% (compared to 2014), i.e. the average decline will be 6.26% per year. The most significant positive changes occurred in maritime transport (average annual growth of 32.4%), negative – in rail (the average yearly decline of 12.8%) (Fig. 3).

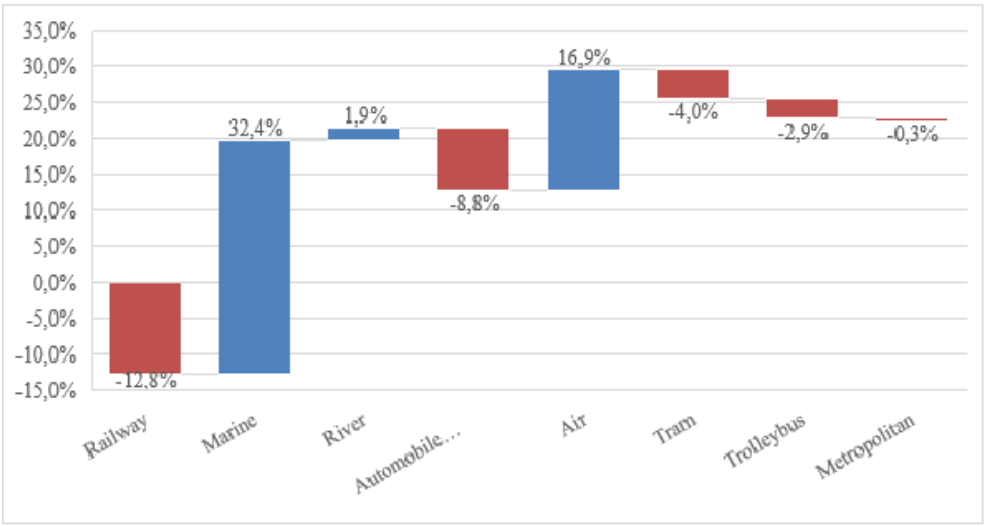

Figure 3 Average annual change in passenger traffic in 2014-2019, % (source: developed by authors based on official statistics [The State Statistics Service of Ukraine])

As for urban transport, there is a drop in demand everywhere. This is due to the growing number of personal cars, primarily due to the mass import to Ukraine of supported cars from

the EU. It is this category of consumers, not having the financial ability to buy a new car, to a greater extent, used public transport.

In Ukraine, with the support of the Ministry of Infrastructure of Ukraine, within the framework of the Draft Framework Loan Agreement for Urban Public Transport of Ukraine, there is the "Urban Public Transport Ukraine Project". Technical documentation for MFI funding applications. However, not all cities submit applications.

Table 1 Infrastructure improvements. Cities that have applied (source: developed by authors based on official data [The Ministry of Infrastructure of Ukraine])

Name of the city	Infrastructure improvement	New ticket system
Chernihiv	Overhaul of existing trolleybus lines	No
Lviv	New trolleybus lines. Overhaul of existing trolleybus lines. New trolleybus depot. Bus station. Bus repair centre. Overhaul of existing tram lines. Tram depot.	No
Ivano-Frankivsk	New catenary and substation	No
Kharkiv	No	No
Kyiv	Capital reconstruction of the tram track 2 x 9.2 km	No
Lutsk	New trolleybus lines. Overhaul of existing trolleybus lines. New contact network.	Yes
Mykolayiv	Comprehensive system of traffic organization and safety	Yes
Odessa	Overhaul of the existing tram route, 2 x 32 km	No
Sumy	No	No
Ternopil	No	No
Zaporizhzhia	No	No

Typical stages of the cycle of city public transport project development is shown in Fig. 4.

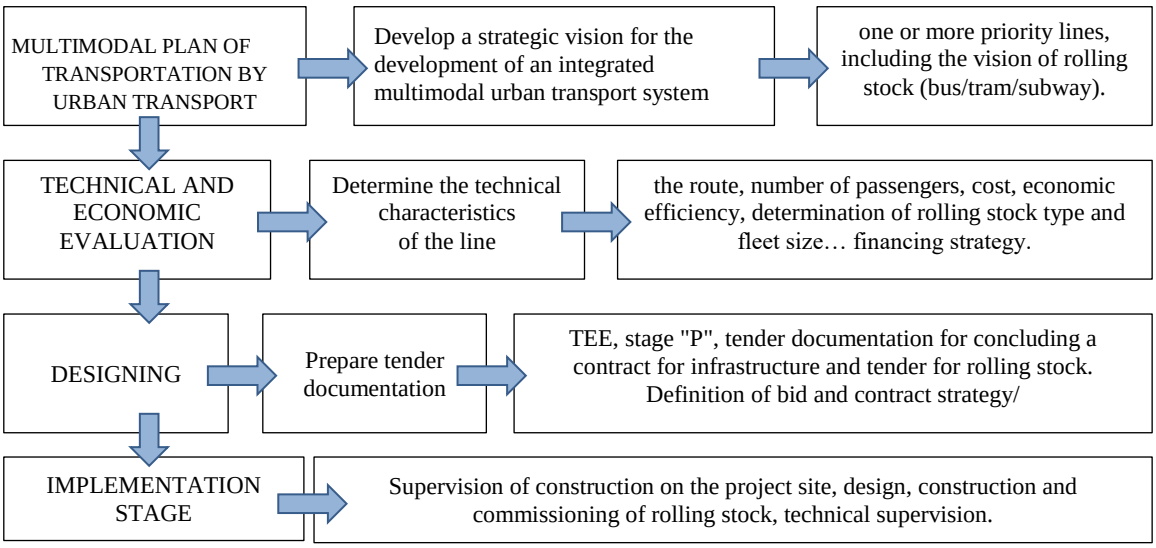

Figure 4 Typical stages of the cycle of city public transport project development (source: developed by authors)

Thus, the context of the project, tasks and definitions are evaluated; technical feasibility (demand and analysis of options) and environmental sustainability; a financial analysis is performed, which includes the calculation of investment costs, operating costs, operating income, an analysis of affordability, evaluates sources of funding, financial efficiency indicators and financial sustainability. The final stages are economic analysis and risk and sensitivity analysis. This is how the issue of urban rolling stock was assessed public transport (Table 2-6) (source: developed by authors based on official data [The Ministry of Infrastructure of Ukraine]).

Table 2 A general overview of needs in urban rolling stock

Cities	Trolleybus	Bus	Tram	Subway
Chernihiv	56			
Lviv	35	75	9	
Ivano-Frankivsk	30	9		
Kharkiv				35
Kyiv		35	10	
Lutsk	30			
Mykolayiv			10	
Odesa			56	
Sumy	22			
Ternopil		10		
Zaporizhzhia	30		20	
TOTAL:	203	129	95	35

Table 3 Trolleybuses

Cities	Trolleybus	Specific price for consideration	TOTAL
Chernihiv	56 (41+15)	82 500 €	4 620 000 €
Lviv	35	200 000 €	11 200 000 €
Ivano-Frankivsk	30	200 000 €	6 000 000 €
Kharkiv	8	187 500 €	1 500 000 €
Kyiv	50	200 000 €	10 000 000 €
Lutsk	30	145 455 €	4 363 650 €
Sumy	22	181 000 €	3 982 000 €
Zaporizhzhia	30	141 000 €	4 230 000 €
TOTAL:	261		45 895 650 €

The unit price under consideration is low compared to the international market. Tenders will be of interest only to national suppliers. The significant size of orders. The price in Chernihiv looks low even for local prices.

Table 4 Buses

Cities	Buses	Specific price for consideration	TOTAL
Lviv	75	120 000 €	9 000 000 €
Ivano-Frankivsk	9	200 000 €	1 800 000 €
Kyiv	35	143 000 €	5 005 000 €
Ternopil	10	80 000 €	800 000 €
TOTAL:	129		16 605 000 €

The unit price under consideration is low compared to the international market. The significant fluctuations in the price range. The tender will be attractive only for national suppliers. Regarding Ternopil, the price of buses 10-12 m long is low.

Table 5 Trams

Cities	Trams	Specific price for consideration	TOTAL
Lviv	9	1 055 555 €	9 499 995 €
Kyiv	10	1 460 000 €	14 600 000 €
Odesa	56	500 000 €	28 000 000 €
Zaporizhzhia 1 (low-floor)	10	580 000 €	5 800 000 €
Zaporizhzhia 2 (standard)	10	516 000 €	5 160 000 €
TOTAL:	95		63 059 995 €

There is a considerable fluctuation in unit prices. Some cities are considering purchasing low-floor rolling stock according to European standards, while others are considering replacing existing T4 or KT4 conventional trams. For some cities, the number of transport units to order is small, which can lead to significant fixed prices. There is a difference in track width between cities (meter in Lviv).

Table 6 A general overview of the subway

Cities	Subway	Specific price for consideration	TOTAL
Kharkiv	35	1 375 000 €	48 125 000 €
TOTAL:	35		48 125 000€

The specific price looks in line with the international market, even slightly higher. The purchase involves only seven trains, with five cars each, which is a very limited size, especially given the organization of maintenance, individual spare parts, training and more.

After this analysis, conclusions are drawn, and an open discussion is held. Thus, the first review of requests from cities gives grounds for the following findings:

- most rolling stock needs are justified by upgrading the existing fleet. In most cases, this applies to the products of national suppliers, reference data and prices;
- the required budgets are usually low and based on little unit prices. Only rolling stock provided by domestic suppliers can meet the budget (except for the metro). This can be a problem if Banks seek international competitive bidding.
- the justification of the benefits defined in the feasibility study should be checked for their confirmation by the appropriate values that must be taken into account in the analysis of costs and benefits. At what stage are the feasibility studies today?
- there is a certain synergy of projects between some Cities, which gives grounds for consolidation of orders and obtaining cheaper financial proposals from rolling stock suppliers.

4.2. Theoretical and Methodological Principles of Tariff Policy Formation in Urban Public Transport

The transport tariff is a system of target rates or prices, according to which a fee is charged for the transportation of passengers within the framework of transportation.

During the formation of the tariff, it is necessary to take into account the interests of transport companies in terms of covering operating costs and making a profit and passengers in terms of obtaining quality transport services. This means that transport services need to be seen from a broader perspective. Their cost should include not only direct monetary fees (fuel and lubricants costs, drivers' salaries, depreciation, etc.) that arise in the process of passenger transportation but also the time and costs associated with the inefficiency of services, discomfort and risks transportation of passengers. However, they are difficult to calculate, as

there is no single approach to their assessment, and they can be fully assessed only after the carriage of passengers.

The tariff for transportation is based on a detailed study of the cost structure of operating activities. Transport companies, which entirely use modern vehicles, managing technologies, adequately and thoroughly take into account the dependent and independent of the size of the movement of costs, in their activities implement a strategy of leadership in costs. This allows you to rationally reduce operating costs, increase the level of competitiveness, profitability and profitability of the enterprise. The basis of such a strategy is to improve the methodology of tariff formation based on a detailed study of the costs of the transport company.

The algorithm for calculating the cost of passenger transportation can be represented as:

$$C = C_1 + C_2 * D_t * K_a \tag{1}$$

where C_1 – the cost of initial and final operations, UAH/rolling stock; C_2 – the cost of mobile operations, UAH/hp-km; D_t – tariff distance of transportation, km; K_a – coefficient that adjusts the cost of a moving operation depending on the distance.

To study in more detail, the question of determining the rational use of the vehicle is necessary to break down the costs of the enterprise into components. In expanded form, the total specific total costs (JI) for the operation of buses can be represented as an expression:

$$CB = \frac{A_1 + A_2 + A_3 + A_4 + A_5 + A_6 + A_7 + A_8 + A_9}{T_o} \tag{2}$$

where A_1 – fixed costs (overhead costs); A_2 – variable costs related to fuel and lubricant costs; A_3 – tire costs; A_4 – depreciation deductions; A_5 – salary costs of drivers and conductors; A_6 – maintenance costs; A_7 – costs of current repairs; A_8 – costs of diagnostics and maintenance; A_9 – costs of spare parts and materials; T_o – operating time of the bus for the calculation period, km.

The method of determining tariffs for passenger transportation by urban passenger transport should be focused on solving the following tasks:

- the level of tariffs for passenger transportation should ensure the availability of passenger transport services for people with different income levels;
- the level of the tariff must be sufficient to reimburse economically justified costs of passenger transport enterprises,
- uncompensated funding from the budget;
- the level of the passenger tariff should provide the necessary and adequate level of profitability for the social development of the team.

The modern practice of fare in urban passenger transport includes the following areas: payment for a route trip in the cabin; depending on the distance of the journey; on a single ticket. Each of the regions has its scheme of distribution of financial flows.

The total cost (TC) for the organization of passenger traffic can be calculated by the formula based on the volume of traffic in the city:

$$TC = \sum_{i=1}^{n} \left[\frac{l_{mi} Q_i}{q_i \, y_{si} \, \beta_i \, k_{var}} \left(V_{var} + \frac{V_{const}}{v_{ei}} \right) \right] \tag{3}$$

where l_{mi} – length of the i-th route, km; Q_i – annual volume of traffic on the i-th route; q_i – passenger capacity of the vehicle; y_{si} – respectively the coefficient of static filling of the vehicle interior on the i-th route, the coefficient of mileage on the i-route; k_{var} – coefficient of variability on the i-th route; V_{var}, V_{const} – respectively variable and constant costs on the i-th route, UAH/km, UAH/hour; v_{ei} – operating speed on the i-th route, km/h.

The method of determining the tariff includes:

- formation of tariffs for transportation by public routes in connections taking into account the operating conditions;
- calculation of the cost of transportation based on economically justified costs;
- calculation of tariffs for transportation in suburban communication taking into account volumes of transportations of privileged categories and financial possibilities of budgets concerning compensation of losses of incomes of carriers.

The value of the tariff is calculated by the formula:

$$T_r = C * (1 + P) \quad (4)$$

where T_r – the value of the tariff for urban passenger transport services; C – the cost of transportation; P – profitability of transportation, which allows you to take into account the level of profitability of the carrier.

Thus, there are a large number of methods of forming a tariff policy, we consider the most suitable one that relies on costs + profit. Accordingly, it is necessary to investigate, a) what price increase would be comfortable for consumers, provided that the trip is more comfortable; b) what factors most positively or negatively influence the choice in favour of using public transport.

A theoretical study allows us to formulate three hypotheses that will be tested empirically.

Hypothesis 1: passengers are more likely to use urban passenger transport if it meets their requirements;

Hypothesis 2: passengers are ready for a significant increase in the cost of the ticket if additional benefits are provided.

Hypothesis 3: drivers are ready to abandon trips to work in their car completely.

Depending on the results of a sociological study, these hypotheses will be adjusted.

5. THE EMPIRICAL PART OF THE RESEARCH

The study involved 3548 people, 975 were interviewed in person, 2573 answered online. The sample has the form (Table 7)

The theoretical study called to identify 18 factors (Table 9) that affect a person's decision to use or not to use public transport, all factors were combined into four groups - Safety, Comfort, Time Saving, Cost. If the factor could be assigned to several groups at the same time, we selected 1 group, to which it belongs to a higher degree.

Table 7 The results of the conducted survey of residents of Ukraine online and internally (source: developed by authors)

Sample size	**Ppl. (%)**
Total	3548 (100%)
Online	2573 (72,5%)
In a personal meeting	975 (27.5%)
Age	
Junior school age (7-17)	12,4%
Young age (18-44)	35,7%
Average age - 45-59	22,2%
Old age - 60-74	26,5%
Senile age (from 75 years)	3,2%
Car availability	
No	38,6%
There is a private car	36,0%
There is a car in the family	15,4%
Income level	
Do not have or minimum subsistence	21,4%
5000-10000	29,3%
11000-24000	32,5%
From 25000 and above	16,8%
According to the results	
Group 1 - use public transport regularly, no personal car	28,7%
Group 2 - use public transport, there is a private car	27,4%
Group 3 - practically do not use public transport, there is no personal car	10,3%
Group 4 - almost do not use public transport, there is a private car	33,6%
Purpose of use	
Only for study (work)	15,7%
For personal affairs	30,1%
For the study (work) and personal matters	54,2%

We allocated 0.25 points of influence for each group. Each factor was evaluated on a 5-point quality scale, namely:

- refuse to use PPT;
- most likely I will refuse to use PPT;
- will not affect;
- most likely will use PPT more often
- will definitely use PPT more often (Fig. 5).

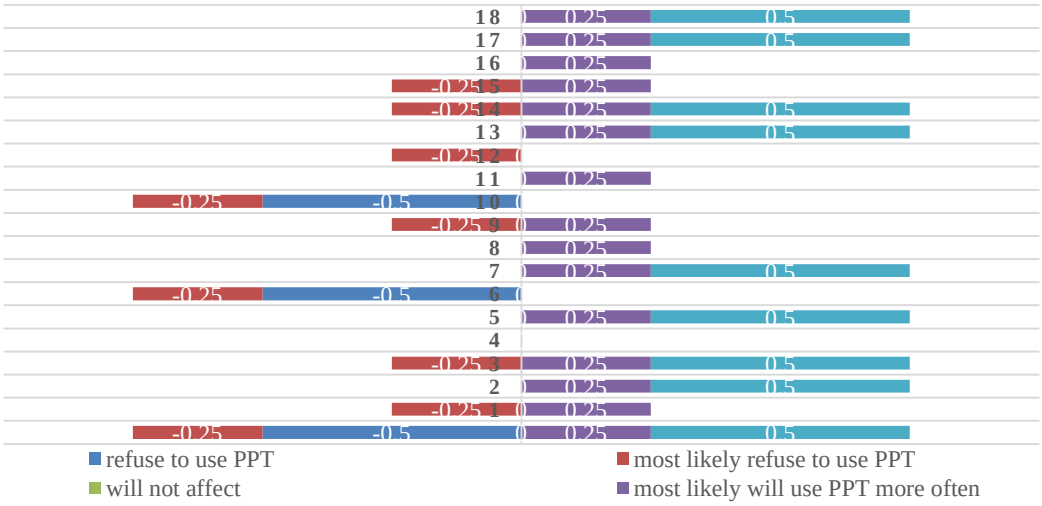

Figure 5 Influence of factors on the choice to use public transport

The results of the questionnaire were processed programmatically, grouped to identify trends in influence.

After receiving the answers, the authors conducted a correlation analysis of the factors affecting both positively and negatively the choice in favour of using public transport (Fig. 6).

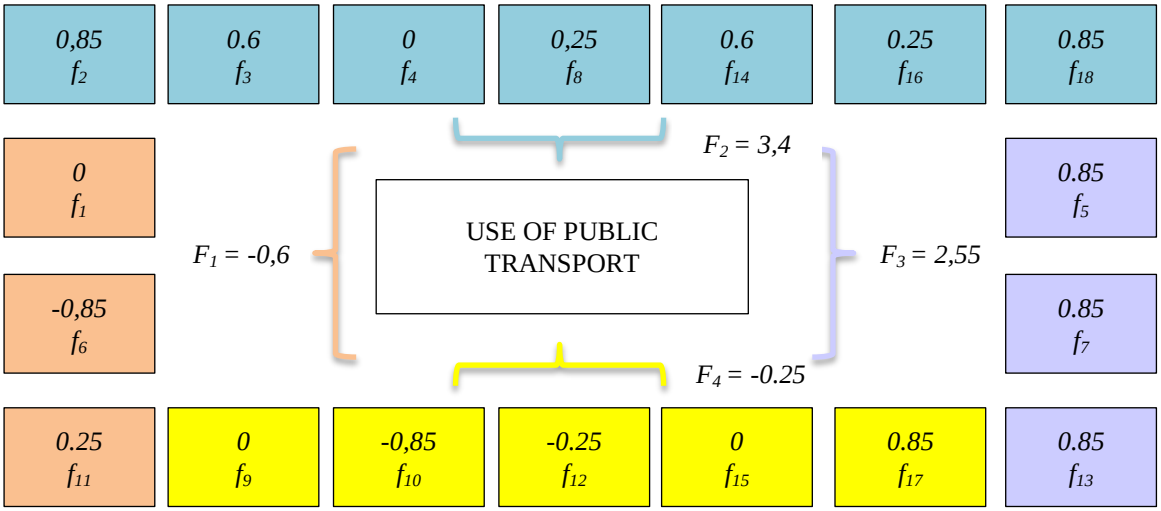

Figure 6 Correlation analysis of factors

Also, when developing proposals, it is necessary to take into account some aspects:

1. There is a category of people for whom to use or not to use PPT is not a choice – it is their necessity due to age (schoolchildren, pensioners).
2. The decision in the future to use or not PPT in today's schoolchildren depends on the experience of using PPT.
3. Pensioners – this is the category of people that can be corrected for the time of use.

Table 8 Ranking factors according to their degree of influence

Value	Factor	Factor	Group
0,85	2	availability of Wi-Fi	Positive significant impact
0,85	5	the ability to pay for the fare in the cabin with a card	
0,85	7	strictly scheduled traffic	
0,85	13	the ability to get to the right place without changes	
0,85	17	significant savings in the cost of a single trip when buying a subscription	
0,85	18	vehicle interior cleanliness	
0,6	3	air-conditioning	Positive significant impact
0,6	14	number of people in the cabin	
0,25	8	the ability to track the movement of the transport in real-time in the app	Slight impact
0,25	11	increased driver requirements	
0,25	16	round-the-clock traffic	
0	1	vehicle technical condition	
0	4	the ability to pay for the fare in the cabin	
0	9	50% increase in fare	
0	15	permission to transport animals in public transport (in compliance with the necessary standards)	
-0,25	12	extra charge for oversized baggage	Bad influence
-0,85	6	criminogenic environment	
-0,85	10	significant increase in fare (3-4 times)	

Since the analysis showed that consumers are not ready for a significant increase in prices (3-4 times), i.e. the city or investor will not be able to satisfy absolutely all the needs of passengers, it is necessary to determine which factors have the highest positive and negative effects – they must be taken into account first of all when setting the tariff, which factors require minimal financial values, but I have an influence on the choice in favour of public transport, and what factors at this stage can be ignored (Tabl. 8).

Thus, based on the research data, recommendations can be developed to improve the tariff policy.

6. RESULTS AND DISCUSSION: DEVELOPMENT OF A RECOMMENDATION FOR IMPROVING THE TARIFF IN CONSIDERATION OF THE TRANSPORT SYSTEM IN THE URBAN PASSENGER TRANSPORT

A study of the theoretical and methodological foundations and a sociological study to enhance the tariff policy in urban passenger transport has allowed identifying such problems that directly or indirectly related to public transport:

1. 50% of respondents are not satisfied with the technical condition of trams and trolleybuses; however, 70% of them report improvement; 95% are not satisfied with the mechanical condition of minibuses (30% indicate the emergency state of some vehicles);
2. 77% of drivers use the vehicle on weekdays only for travel to and from work and 56% would transfer to public transport if

a) he went on schedule;

b) would go faster than a car;

b) there would be fewer people;

c) there would be no theft;

3. when eliminating the above problems and creating additional factors for the comfortable use of public transport (Wi-Fi, air conditioning, the ability to track the movement of public transport by application in real-time), 73% of respondents would use it more often;
4. 27% of those who use cars would never have moved to public transport, because:

a) getting to work is necessary with transfers; b) I use a car during the day; c) auto is my status.

5. 65% think personal vehicles are more manoeuvrable, i.e. the way to work takes less time;
6. 82.4% are willing to pay for one trip up to 15 UAH, 40.7% up to 30 UAH. It is worth noting that those who are ready for a reasonably high price have used public transport and know the fare abroad.

Thus, the proposals we developed are as follows:

1. monitoring of routes for their optimization and allocation of a separate lane for the movement of public transport only, especially in the "red" zones;
2. updating the fleet of vehicles in two aspects:

a) to private carriers to give a license only if certain conditions are met and to deprive it in case of violations;

b) modernization of trolleybuses and trams - Wi-Fi, air conditioning, smart metering system;

3. review of tariff policy:

a) set a different price depending on the time of day. This will relieve a load of public transport at rush hour. So, for example, for this, you must install a sizeable bright clock in the cabin.

b) cancel the effect of preferential tariffs at rush hour. This reinforces the impact of the first sentence.

c) increase the fare. It is especially important here that we do not confront the population about the increase in prices but explain them. Rising prices should be either simultaneously with the introduction of improvements, or after, but in no case "before", this will only cause a negative on the part of the population and the future complete rejection of innovations.

Regarding the tariff policy – we offer the calculation of the tariff (fare) according to the formula:

$$T_f = \frac{CS_a + P_{pl.a} + F_m}{V} \quad (5)$$

where T_f – a tariff for passenger transportation services in urban passenger transport;

CS_a – the planned annual cost of services, UAH;
$P_{pl.a}$ – planned profit on the route for the year, UAH (20%);
F_m – funds for modernization of the transport system, UAH (17%);
V – planned for the year the volume of passenger traffic on the route, people; (substantiated based on actual performance indicators or established by the results of the survey of passenger flows);

The following cost structure is used to determine the planned cost (CS_a): 1. Production cost: 1.1. Direct material costs: fuel; lubricants; tires. 1.2. Direct labour costs: drivers' salaries. 1.3. Other costs: costs of obtaining licenses, license cards, tech. passports, permits, inspections; accrual of drivers' wages; depreciation of rolling stock; wages of repair workers with accumulations; spare parts and materials. 1.4. Total expenditures. 2. Administrative costs. 3. Sales costs. 4. Other costs. 5. Financial costs.

Economically justified planned profit on the route for the year ($P_{pl.a}$) is determined according to its structure. The structure of profit use is as follows:

- funds needed to finance their own domestic needs, the costs of which are not included in the cost. Studies conducted by specialists have found that the share of such expenses in the total profit of the carrier is 5-10%;
- funds needed to upgrade fixed assets, especially rolling stock. In addition to advantage, depreciation deductions are also used for this purpose;
- taxes.

To take into account the interests of both passengers and carriers, as well as to prevent social tensions in the region, funds for the modernization of the transport system should be approximately 15-17% per annum.

Before raising the tariff, it is necessary to calculate what changes can already be made, first of all, these are the factors that do not involve a significant investment, but have a positive impact on the use of transport. For example,

Strictly scheduled traffic (f_7), the ability to get to the right place without changes (f_{13}) – it is necessary to review the current traffic interchange and vehicle interior cleanliness (f_{18}).

7. CONCLUSION

There are significant problems in the organization of the transport system in most cities of Ukraine. Their solution is carried out gradually. At the same time, it is worth taking into account the international experience in solving passenger transport problems. You can define the following steps:

- planning convenient routes according to the real needs of the population, providing a clear schedule of their way through the city;
- replenishment of the transport fleet with more economical and modern means of Ukrainian production, which will ensure the development of the domestic producer;
- improving the system of maintenance and repair, increasing speed and traffic safety;
- calculation of a single general economically justified tariff for urban transportation.

It is also important to remember the importance of developing a road network. That is why the complex task of restoring the transport network should include not only the revival of the public transport fleet, training of employees but also high-quality repair of roads. However, insufficient funding is a significant obstacle to the implementation of such a program, so under these conditions, every civil servant must be a lobbyist for the interests of his or her community in the relevant bodies, realizing his or her responsibility to it.

Thus, the problem of maintenance and development of rolling stock is to create such a system of its support, which would guarantee constant readiness, safety and efficiency of passenger transport for the entire period of its operation. This complex process must take into account both social and national aspects of the overall development of the system, best meeting the transport needs of the population and the development of domestic producers.

As for the tariff policy on urban transport, the study made it possible to identify the following conclusions:

- not all participants in the transport system have a full functional load. Carriers who win the tender do not have their own vehicles do not incur costs for its maintenance, but at the same time have constant cash flows that do not depend on the number of passengers carried;
- the method of calculating the tariff allows to include in the cost of the service a shallow level of the expenses for the restoration of the technical condition of vehicles. In these circumstances, the payback period of transport is very long, in some cases, taking into account the quality of the road surface, it exceeds the service life of vehicles;
- the current system of bringing inflated plans to the drivers of the route leads to significant violations, which significantly reduce the quality of passenger transportation services.

The solution of these problems is possible with the introduction of a single dispatching service of the common form of management.

Considering the tariff systems and compensation policy in public transport of foreign countries, we can see a bright contrast with the Ukrainian system, which has long become obsolete and does not meet the needs of citizens. It is advisable to allow the possibility of increasing the fare to 10-15 UAH. for a single ticket. This would be a kind of extra fee in the system, which would encourage not one-time, but frequent trips. However, a system of tariff plans should be developed that would allow locals and tourists to save, actively use public transport and have much lower actual travel costs. Such decisions will satisfy both the carrier and passengers.

Requirements for the professional level of specialists must be uniform for employees of enterprises of all forms of ownership and meet the needs of state regulations. The level of training of managers, specialists and drivers of transport companies should become one of the

factors that are taken into account when conducting competitions for the right to work on city bus routes.

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