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dr Kamil Waligóra[1]
Faculty of Economics and Finance
University of Bialystok

Social and financial inequalities in the availability of public transport in selected capitals of Polish voivodeships[2]

Abstract

The aim of the article was to determine the scale of the impact of the financial barrier in public collective transport (hereinafter: PCT) in selected local government units and to compare selected voivodeship cities – metropolitan centers in terms of the mobility policy applied in the financial aspect.

The study aims to identify differences in transport accessibility based on the relationship between ticket prices and residents' incomes and to examine the potential effects of eliminating fees for public transport use on reducing social inequalities.

Moreover, the aim was to benchmark selected voivodeship cities – metropolitan centres, in terms of the applied tariff policy within the framework of public transport (hereinafter: PCT) in comparison with the disposable income of the population.

The research problem was the affordability of public collective transport in selected LGUs. 9 out of 10 largest Polish cities in terms of population. So far, none of them has implemented unconditional free public transport. Therefore, there is a financial barrier, which in the case of the lowest-earning residents, makes it difficult to meet current life needs.

The analysis was carried out in mid-2024 based on data from the turn of 2023/2024 and selected, from 2022, mostly from public statistics, including the Central Statistical Office (Polish: GUS). Polish and foreign literature and industry press were used. The own study was based on information from LGUs and their communication companies. Finally, the analyzed cities were categorized in terms of the adopted criteria.

It can be stated that the lack of fees for using PCT will translate into a reduction in social inequalities in a given LGU. The scale of this change cannot be determined *ex-ante*, and therefore the effectiveness of such a policy cannot be estimated. As part of the benchmarking, the studied group can be divided into three categories in terms of financial accessibility: highly accessible

[1] Correspondence address: University of Bialystok, Faculty of Economics and Finance, ul. Warszawska 63, p. 229, 15-062 Białystok; e-mail: k.waligora@uwb.edu.pl. ORCID: 0000-0003-2034-4727.

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(Gdańsk, Kraków, Poznań), with average financial accessibility (Lublin, Szczecin and Wrocław) and with low financial accessibility (Białystok, Bydgoszcz and Łódź).

Keywords: mobility, city, exclusion, ticket, cost.

Nierówności społeczne a finansowa dostępność transportu publicznego w wybranych stolicach polskich województw

Abstrakt

Celem artykułu było określenie skali wpływu bariery finansowej w publicznym transporcie zbiorowym (dalej: PCT) na wybrane jednostki samorządu terytorialnego oraz porównanie wybranych miast wojewódzkich – ośrodków metropolitalnych pod względem stosowanej polityki mobilności w aspekcie finansowym.

Celem badania była identyfikacja różnic w dostępności transportu na podstawie relacji cen biletów do dochodów mieszkańców oraz zbadanie potencjalnych skutków zniesienia opłat za korzystanie z transportu publicznego na zmniejszenie nierówności społecznych.

Ponadto celem był benchmarking wybranych miast wojewódzkich – ośrodków metropolitalnych, pod względem stosowanej polityki taryfowej w ramach publicznego transportu zbiorowego (dalej: PCT) w zestawieniu z dochodami rozporządzalnymi ludności.

Problemem badawczym była dostępność finansowa publicznego transportu zbiorowego w wybranych JST. 9 z 10 największych polskich miast pod względem liczby ludności. Do tej pory żaden z nich nie wdrożył bezwarunkowego bezpłatnego transportu publicznego. Istnieje zatem bariera finansowa, która w przypadku najgorzej zarabiających mieszkańców utrudnia zaspokojenie bieżących potrzeb życiowych.

Analizę przeprowadzono w połowie 2024 r. na podstawie danych z przełomu 2023/2024 r. i wybranych, z 2022 r., wykorzystując głównie statystyki publiczne, w tym GUS. Przeprowadzono przegląd literatury polskiej i zagranicznej oraz prasy branżowej. W badaniu własnym wykorzystano informacje pochodzące od JST i ich firm telekomunikacyjnych. Na koniec dokonano kategoryzacji analizowanych miast ze względu na przyjęte kryteria.

Ostatecznie stwierdzono, że brak opłat za korzystanie z PCT przełoży się na zmniejszenie nierówności społecznych w danej JST. Skali tej zmiany nie można określić *ex ante*, a co za tym idzie, nie można oszacować efektywności takiej polityki. W ramach benchmarkingu badaną grupę podzielono na trzy kategorie pod względem dostępności finansowej: wysoko dostępną (Gdańsk, Kraków, Poznań), o średniej dostępności finansowej (Lublin, Szczecin i Wrocław) oraz o niskiej dostępności finansowej (Białystok, Bydgoszcz i Łódź).

Słowa kluczowe: mobilność, miasto, wykluczenie, bilet, koszt.

JEL: H71, H72, H75, H76, L98, O18, R48.

Introduction

In the EU transport policy, we can find specific expectations regarding public transport. These include the construction of sustainable, intelligent and resilient urban mobility systems based on an active public sector and its capabilities to meet needs in this matter (Mercik, 2023, p. 710). This leads

to a basic conclusion: this transport should (theoretically) be available to all residents of a given area.

The research problem will be the affordability of public collective transport (hereinafter PCT) in selected LGUs. 9 out of 10 largest Polish cities in terms of population were used for further analysis. So far, none of them has implemented unconditional free public transport. Therefore, there is a financial barrier, which in the case of the lowest-earning residents, makes it difficult to meet current life needs. This was considered a significant research problem and relatively little analysed in Polish-language literature, within the framework of domestic economic conditions. It was assumed that the social severity of the financial barrier is the greater the higher the ticket fee paid by a potential user of individual transport is in relation to their income.

The aims of the article are to identify differences in transport accessibility based on the relationship between ticket prices and residents' incomes and benchmark selected provincial cities – metropolitan centres with a population of 300-800 thousand in terms of the affordability of public transport. Białystok (292 thousand people) and Kraków (806 thousand people) were included in the range, obtaining nine entities subject to further study. Finally, the analysed cities were categorized in terms of the adopted criteria.

The analysis was carried out in mid-2024 based on data from the turn of 2023/2024 and selected, from 2022, mostly from public statistics, including the Central Statistical Office (Polish: GUS). Polish and foreign literature and industry press were used. The own study was based on information from LGUs and their communication companies.

Urban public transport and social inequalities – definitions

Inequalities are associated with the poorer economic geographic areas of the world, countries known as developing. However, the problem affects every part of the globe, differing only in its spatial scale (Hatzenbuehler et al., 2024). An example is the eastern provinces of Poland, classified in the European nomenclature as less developed regions (Dz.U. UE 2019/C 162/03). People are moving to the largest cities and their metropolitan areas, which is confirmed by subsequent censuses and studies of population migration (GUS, https). This leads to the conclusion that these areas are subject to special challenges related to inequalities that have their basis in the current and past financial situation of these people.

When looking for synonyms for "inequality", terms such as asymmetric, disproportionate, uneven, non-uniform, irregular, etc. come to mind. When inequality concerns society, it is defined by access to specific, expected goods,

uneven levels of need satisfaction, measured, for example, by individual life satisfaction and/or consumption (Kałamucka, 2023, pp. 118–122). It should therefore be stated that inequalities concern diverse aspects of life (Pliszka, 2005, pp. 451–454). The implications are transferred to opportunities (or lack thereof) in terms of work, education, access to health care or, more broadly, the living conditions of individuals and social groups; they are associated with being born in a specific place (Suter, 2000, pp. 6589–6594). The basis for inequality may be a lack of understanding of the needs of people who experience certain aspects of urban mobility differently than people with various types of disabilities (e.g. physical, intellectual, cognitive, sensory) (Mwaka et al., 2024). Social inequalities affect many areas of human life, but they are most often associated with income differentiation. Social inequalities are noticeable in every area of life and have an impact on the material and non-material existence of a person (Krot, Lewicka, 2016, pp. 233–244; Velho et al., 2016, pp. 24–35). Exclusion related to poverty can be activated and maintained, among others, by the lack or deficiency of mobility in physical space (Kenyon, 2006, pp. 1–120). At the same time, these inequalities have an impact on human mobility; financial access to public transport is a limitation. There is a feedback loop here: well-managed human and social mobility can contribute to reducing inequalities (Hackl, 2018, pp. 150–162).

The Polish legislator defined public collective transport as "generally available regular passenger transport performed at specified intervals and on a specified communication line, communication lines or communication network" (Art. 4 ustawy z dnia 16 grudnia 2010 r. o publicznym transporcie zbiorowym, Dz.U. 2023 poz. 2778). In addition, the same article of the Act includes a definition of public transport. These are universally available services in the scope of public collective transport performed by a public collective transport operator for the purpose of current and uninterrupted satisfaction of the transport needs of a given community in a given area, which in this case is the borders of a LGU (Dz.U. 2023 poz. 2778). The implementation of this goal is limited by the financial considerations of a given commune and (in the case of payment) the disposable income of the population.

Another concept that combines the two above is the "affordability" of public transport. It is understood as the conscious possibility of incurring expenses related to urban mobility using public transport. The financial costs of travel are assessed – their impact on the budgets of individuals and households (Carruthers, Dick, Saurkar, 2005, pp. 1–2). The affordability of public transport can be measured by the nature of travel and its structure: whether a given person travels exclusively out of duty (work, school, medical care) or for pleasure (e.g. to the cinema, theatre, sporting event). The affordability of transport is higher the lower the percentage of travel costs in total expenses. Each city applies a different pricing policy, which is an interesting material for comparison.

AFFORDABILITY OF PUBLIC TRANSPORT IN SELECTED POLISH CITIES

The affordability of public transport services is one of many problems within the macro-problem of social inequality. As mentioned in the introduction, each of the cities studied applies a ticket fee. In this case, the affordability of transport will be compared to the financial capabilities of society. A single-ride ticket (or – in the absence of such an option – its time equivalent in the form of a 45/60-minute ticket) cost in 2024 from PLN 3.80 (Bydgoszcz) to PLN 6 (in Krakow and Poznań), which in a "round trip" gives amounts from PLN 7.60 to PLN 12. Theoretically, these are not significant – in relation to the disposable budget of households in Poland – amounts, but they can be a barrier for people with the lowest incomes. For example, from January 1, 2025, the income criteria for social assistance will increase to a maximum of: PLN 1,010 (currently – PLN 786) for a person running a household alone and PLN 823 (currently – PLN 600) for a person in a family (Dz.U. 2024 poz. 1044). Referring this to the average number of working days per month treated as activity (in 2024: 21 days/month) it should be stated that the monthly cost of PCT in the cities studied would range (for PLN 3.80 and PLN 6 per ticket; taking into account one return trip): from PLN 159.6 to PLN 252, which would constitute 20%–32% of the budget of a single-person household and 26%–42% per person in a multi-person household. In the case of a single-person household, on the lowest statutory salary, which from mid-2024 amounts to PLN 3,262 net (full-time job), this gives a share of disposable income from 5% to 7.7%. Mobility within the LGU may therefore be limited by the affordability of PCT.

In the case of people who use public transport regularly and treat it as their so-called "first choice", a more adequate comparison will be the cost of monthly tickets, which is presented in the table below (Table 1). The cost of purchasing a ticket was compared to the average monthly gross salary. It should therefore be remembered that the availability of a monthly ticket measured by its price will be lower, because citizens have a net salary.

Table 1. Summary: monthly ticket prices, average monthly gross salary and the relation between the price of a monthly ticket within the PCT to the above-mentioned salary in selected Polish cities in 2024

City	Price of a monthly ticket, without discounts, for all day lines in PCT) in PLN (as of 01/07/2024)	Average gross monthly salary (in PLN; at the end of 2023)	The relationship between the price of a monthly ticket and the average monthly gross salary
1	*2*	*3*	*4*
Białystok	130.00	7089.31	1.83%
Bydgoszcz	108.00	7478.19	1.44%
Gdańsk	117.00	8915.97	1.31%

1	*2*	*3*	*4*
Kraków	90.00	9223.73	0.98%
Lublin	128.00	7443.57	1.72%
Łódź	168.00	7548.10	2.23%
Poznań	149.00	8303.38	1.79%
Szczecin	140.00	7933.31	1.76%
Wrocław	110.00	8334.84	1.32%

Source: own study based on public transport websites in the surveyed cities, as well as data from (the Central Statistical Office, https).

Kraków is the leader of the list, with a burden of less than 1% in relation to the average gross monthly salary. Moreover – comparing the retail price of a monthly ticket for an individual customer to the social benefit threshold under the income criterion in the scope of social assistance for a single-person household – the purchase cost constitutes 11.5% of the amount of the income threshold of social assistance and is also the lowest in the above list. At the opposite end of the spectrum is Łódź with a price of PLN 168 for a monthly personal ticket. Its purchase is an expense of around 2.23% of the average monthly salary according to the Central Statistical Office for a given LGU; comparing the cost of purchasing a ticket to the income criterion in the scope of social assistance for a single-person household gives 21.4%. Such a high share, with limited disposable income, may therefore clearly affect the ability to use PCT.

Based on data from the Central Statistical Office, it is worth tracking the number of households that benefited from community social assistance benefits in a given year. The Central Statistical Office included such a household in the statistics only once, without taking into account the number of benefits and the number of people in a given household (and therefore the actual number of beneficiaries). The data was compared with the number of households according to the National Census of 2021. According to the legislator, "a household using community social assistance is one that has received financial assistance, in kind or in the form of services through a social welfare center" (Dz.U. 2016 poz. 930). The condition for granting assistance is the occurrence of one of the problems listed in Article 7 of the above Act. In the case of cash benefits, the basic condition for their granting is the income criterion, which was mentioned in the earlier part of the article.

The above table shows the scale of the problem of access to PCT. The above percentage of households may have limited possibilities, e.g. in terms of performing work and adapting qualifications to the spatial needs in a given LGU. Paying for public transport contributes to a decrease in the efficiency of using human capital in a given LGU, negatively affecting the labor market.

Table 2. Share of households covered by social assistance (according to income criterion; 2022) in all households in LGUs (NSP2021)

City	Number of households covered by social assistance support based on income criteria (according to data for 2022)	Number of households based on the 2021 National Census	Share of households covered by social assistance based on income criterion in the total number of households in a given commune
Białystok	4,551	111,569	4.1%
Bydgoszcz	3,833	129,662	3.0%
Gdańsk	4,874	193,377	2.5%
Kraków	8,934	320,708	2.8%
Lublin	4,619	127,631	3.6%
Łódź	10,977	289,269	3.8%
Poznań	11,471	220,993	5.2%
Szczecin	5,028	155,886	3.2%
Wrocław	5,398	280,635	1.9%

Source: own study based on: (Central Statistical Office, Local Data Bank, Number of households covered by social assistance support based on income criterion, and Number of Households according to NSP2021, https).

Is the lack of individual payment for the use of PCT a panacea for social inequalities in terms of mobility?

It is therefore appropriate to consider a situation in which the cities studied waive individual fees for access to PCT. Would the number of passengers served increase? The answer seems obvious: yes. For example, research by foreign authors, e.g. on the unified (and lower than before) tariff for Lisbon introduced in 2019, showed an increase in the use of public transport (Silver et al., 2023). By how much? – we cannot measure this ex-ante. It should be emphasized that the affordability of public transport is an important, although one of many, factors encouraging or discouraging the use of this means of transport in the territory of LGUs (Kwarciński, 2013, pp. 230–236; Goliszek, Połom, 2016, pp. 16–27). To some extent, the answer to this type of question is illustrated in the table below (Table 3). It presents the relationship between the number of passengers and the population.

The largest number of passengers per year, relative to the number of inhabitants, is carried by operators in Poznań, followed by Kraków. It is worth mentioning that Poznań was in 3rd place from the end in terms of the relation between the price of a monthly ticket and the average monthly gross salary; a higher relation was only observed in Białystok and Łódź. In Białystok, there were 204 passengers

per resident in 2023, which was the lowest result). Therefore, a correlation can be observed between the price of a monthly ticket and the number of passengers transported annually by PCT. However, it should be noted that in cities such as Poznań, Wrocław, Kraków or Gdańsk, the number of passengers is inflated by tourists and students; the latter – due to the relatively large and recognizable universities located there. It should therefore be stated that the course of the curve responsible for the relation between ticket prices and the level of PCT use will be different for individual urban centres. Thus, the impact of reducing the price of transport on the increase in the number of passengers will not be uniform for the cities studied.

Table 3. The number of public transport passengers in relation to the population of LGUs (in 2023, in millions of people)

City	Population (2023 in millions)	Number of public transport passengers (2023 in millions)	Number of passengers compared to the population in a given city
Białystok	0.29169	59.50	203.99
Bydgoszcz	0.32643	90.20	276.32
Gdańsk	0.48737	158.20	324.60
Kraków	0.80620	351.90	436.49
Lublin	0.32957	107.00	324.67
Łódź	0.65202	177.50	272.23
Poznań	0.53844	251.70	467.46
Szczecin	0.38907	150.00	385.54
Wrocław	0.67374	194.50	288.69

Source: own study based on public transport websites in the surveyed cities, as well as data from (the Central Statistical Office, Local Data Bank, https).

Conclusions and recommendations

It can be stated that the lack of fees for using PCT will translate into a reduction in social inequalities in a given LGU. The scale of this change cannot be determined *ex-ante*, and therefore the effectiveness of such a policy cannot be estimated. Free PCT is not an ideal solution. Such an approach may intensify unfavourable social behaviours, e.g. taking over pedestrian traffic (I can ride 2 stops "for free"), or lead to the creation of induced traffic (trips that would not have been made before). Moreover – referring to the first part of the article - the lack of payment could be combined with social assistance and thus intensify the association that PCT is for "poor people", and no one wants to be qualified as such (Mazur, 2024, https). In January 2024, 94 communes in Poland were

covered by free transport addressed to everyone or only to residents. However, it should be emphasised that these were smaller communes (maximum several dozen thousand inhabitants) with a poorly developed bus network and a small number of connections per day, which is not really able to replace private transport, as is the case in the largest cities in Poland.

However, the question remains open whether the provincial cities that are the subjects of the study cannot afford to bear the costs of this transport. After all, the goal is the greater good – ensuring mobility for citizens. Additionally, there are environmental benefits and benefits related to attracting external human capital.

As part of the benchmarking, taking into account, among others, the income of the population, the prices of individual types of tickets, the effect in the form of the number of passengers using PCT – the studied group can be divided into three categories in terms of financial accessibility: highly accessible, with average financial accessibility and with low financial accessibility. The first category included Gdańsk, Kraków and Poznań. These are large agglomerations with relatively high (compared to the other entities in the study) income per capita. The efficiency of functioning and spatial accessibility of public transport and relatively low or average prices of single and season tickets ultimately translated into quite high results in this ranking. The second category included Lublin, Szczecin and Wrocław. The lowest category includes: Białystok, Bydgoszcz and Łódź. In each of them, ensuring individual mobility requires the involvement of a relatively larger part of the budget of individuals than in the case of other cities. At the same time, Białystok has the greatest potential related to the possibility of increasing the number of PCT users in relation to reducing ticket prices. In recent years, the number of passengers has been decreasing, while public transport ticket prices have been increasing. Analyzing this relationship, it can be clearly stated that a radical reduction in the price of a ticket with the promise of a future freeze (and then liquidation) of fees would encourage people to abandon the use of individual transport. A good example is the "German ticket for 9 euros" (Rozynek, 2024, pp. 80–90), which led to an increase in the use of public rail transport precisely by lowering the financial barrier. According to estimates by the German government, as a result of the implementation of the 9-euro ticket, 52 million people used public transport between June and the end of August 2022 alone and it was possible to reduce air pollution emissions by approximately 1.8 million tons of CO_2 emissions (Michalak, 2022).

Due to transport subsidies for entities performing these tasks and the costs for local government units associated with this, scientists most often analyze the possibility of limiting the amount of budget subsidies for public transport without discouraging potential passengers (demand) and maintaining the supply of services. The goal – most often – is to limit the satisfaction of the need for mobility by car in LGUs (Bąkowski, 2015, pp. 3–9). Here, therefore, there is room

for deepening research on the ability of LGUs' budgets to take over the entire burden of financing public transport.

Based on the above and the experience of other Polish cities, the formation of transport tariffs should refer to a greater extent to the actual financial possibilities of potential users. A good example is Białystok, which introduced no fees for children and studying youth (Dz.U. Woj. Podlaskiego z 2019 r. poz. 5074). Similar forms of support for disabled people, those looking for (unemployed) or taking up a job would be advisable (e.g. free of charge for the first three months of starting employment). Such evolutionary changes in the formation of tariffs and exclusions from fees would allow for an increase in the affordability of PCT in the largest Polish cities and would be an important step towards ensuring free public transport.

The problem of the relatively low use of PCT is also stereotypes, e.g. associations with poverty, lack of professional success. In addition, people with discounts, i.e. pupils, students, and retirees, use public transport. Those who would use a full-price ticket strive to purchase an individual means of transport - a private car. This is the result of the dominant thinking for many generations that one's own house and car are the synonyms of success and luxury. This is confirmed, for example, by the study by the Lindorff company entitled "The material situation of Poles" from 2017, in which 64% of respondents indicated a car as a synonym for wealth (Arak, 2024). J. Gierczak ventured to make a far-reaching statement that the lack of a car disqualifies a person socially. At the same time, he pointed out that this approach is independent of the intellectual level of the people surveyed (Gierczak, 1994, p. 12). The growing number of wealthy Poles (income above PLN 120,000 gross per year) does not help in changing stereotypes. Despite the pandemic and unfavourable changes in taxes, the 2024 KPMG report indicated that the number of such people increased by as much as 51% between 2021 and 2022 (KPMG, 2024). To sum up, social (including pro-ecological) and political (legal) actions are necessary to change transport habits towards greater use of PCT (Kasperska, 2011, p. 1108).

The elimination of the financial barrier to using public transport would not translate into a change in the mobility habits of the urban population in the short term. However, it would have a major impact on decisions at the time of using up a private vehicle, or especially on younger users and their future. The implementation of free public transport is a solution that could contribute to solving, or at least reducing the scale of the impact of other problems, starting with air quality, noise, traffic congestion, the need to build new parking lots, wider roads, etc. These effects are difficult to assess and compare with the costs of maintaining PCT and probably for this reason, there is no change in the concept of mobility in cities.

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