

SOCIODEMOGRAPHIC CHARACTERISTICS AND ACCEPTANCE OF FREE TRANSPORT

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Abstract: Free public transport has been introduced in many urban areas around the world. Passengers' decision-making behaviour is influenced by many different factors. In this article, we examine the extent to which sociodemographic characteristics such as age, social status, and education may be relevant to the acceptance and even preference for free public transport. For the purposes of this study, an original survey questionnaire was developed to collect residents' opinions on the introduction of free public transport. The questionnaire contained 11 questions, including four on anonymous sociodemographic factors. The collected data was subjected to quantitative and descriptive analysis. The results show that older people are more likely to prefer free transport for city residents. However, professionally active people and pensioners were more likely to see the positive effects of free public transport, such as improved service quality, reduced emissions, and noise reduction. The unemployed, students, and the self-employed were more likely to be sceptical about these effects. Furthermore, people with basic education were slightly less likely to recognize the innovative potential of free transport.

Keywords: free transport, public transport, urban area, fare, passengers

1. INTRODUCTION

Free public transport programmes have been implemented in nearly 400 urban areas around the world, particularly in Brazil, Poland, France, the United States, Estonia and Luxembourg (Gillard et al., 2025; Carr and Hesse, 2020). According to W. Kębłowski (2020), most of the localities offering completely abolished fares are located in Poland (all of them appeared after 2010) and France (Kębłowski, 2020). The free bus transport that we discuss is often part of a broader programme of fare-free public transport. Fare-free public transport (FFPT), can be “understood as a particular form of subsidy provided by (local) governments and institutions” (Kębłowski, 2020, p. 2810). The definition provided is very general, as the term “free transport” can mean temporary free transport (for the duration of certain events), may cover only selected social groups (e.g., seniors and students), and may be spatially limited (e.g., within city limits). In reality, free transport is

free—someone always covers its operation. If organised by the city authorities, the operator receives compensation for lost costs from the city budget.

Previous research on the motives and effects of introducing free transport has focused on economic aspects (Olsen, 2000; Sims, 2001; Perone, 2002; Perone and Volinski 2003; Van Goeverden, 2006; Fearnley, 2013; Cats et al., 2014; Tomanek, 2017; Kębłowski et al., 2019; Sani et al. 2020; Kębłowski, 2020; Grzelec and Jagiełło, 2020; Bindzar et al., 2024), environmental (Tomanek, 2017; Malmqvist et al., 2018; Gabaldón-Estev et al., 2019; Kębłowski, 2020; Blättler et al., 2024; Liang and Wang, 2025; Kuzior and Sira, 2025; Luvisetto and Ricci, 2025) and social (Perone, 2002; Fearnley, 2013; Tomanek, 2017; Štraub and Jaroš, 2019; Zhang et al., 2019; Rambaldini-Gooding et al., 2023; Sträuli, 2024; Maciejewska, 2024; Zukowski, 2024). This division is arbitrary, as a significant number of authors describe both the economic and environmental aspects (including negative ones) of free transport.

Research on passenger age indicates significant differences in transport use. For example, it is widely accepted that older passengers need more time to board and board from transport (Tirachini, 2013). The introduction of free transport increases the number of older people using it by about 9% (however, this increase in public transport use is mainly due to the replacement of walking) (Vieira et al., 2025). If free public transport is introduced, the number of older people using it increases, but this is at the expense of other means of travel (Shin, 2021). It should be noted that many cities offer free public transport only to selected groups, including older people (Zukowski, 2024). The main objective of such solutions is to reduce social exclusion among older people (Andrews et al., 2012) and creating opportunities for social bonding (Rambaldini-Gooding et al., 2023).

Passengers' education should also be relevant to the use of free transport. It can be assumed that educated people earn more and therefore have many other opportunities to travel. What may be important are certain habits. In some cities, there is free transport for students (Brown et al., 2003). Graduates may also have greater knowledge of the environmental impact of transport, although this is not the only factor. However, the relationship between increased environmental awareness and behavioural change is not as clear (Wong et al., 2018, p. 133). People do not always act according to their environmental awareness or understanding because they do not value the environment enough (Ashley, 2000).

Many factors influence the decision-making behaviour. These include cultural and social factors (e.g. reference groups, family roles and status), personality factors, education, age and stage of life, economic situation and lifestyle; as well as psychological factors (motivation/perception of service quality, beliefs/attitudes about public bus transport in terms of satisfaction), safety, accessibility (Peter and Oslon, 2010).

This is why it is so important to determine the extent to which certain sociodemographic characteristics are relevant to the choice of free transport. The literature review clearly indicates that although social categories are the subject of research (Andrews et al., 2012; Tirachini, 2013; Rambaldini-Gooding et al., 2023; Zukowski, 2024; T. Brown et al., 2003), the primary focus is on behaviours or barriers to such solutions. The motivations for promoting free transportation by various institutions are also explored. However, there are few studies indicating the extent to which sociodemographic characteristics are important in choosing free transportation. This publication and research gap is addressed in this article.

Therefore, the main objective of this article is to determine the extent to which sociodemographic characteristics may be important for the acceptance and even preference of free communication.

For the purposes of this article, the following research questions have been formulated.

- (1) Are there differences in the perception of free transport based on age?
- (2) Does social status matter when it comes to evaluating the introduction of free transport?
- (3) Can education be of any significance in assessing the introduction of free transport?

2. METHODS

The survey was conducted in the city of Racibórz and its surroundings using a standardised questionnaire designed to gather residents' opinions on the introduction of free public transport. The sample selection method was random; throughout the data collection period, the interviewees distributed questionnaires to people using public transport in Racibórz and the surrounding area. The questionnaires were collected electronically between 16 January and 10 February 2025 using the Google Forms platform. A total of 1,109 adult users of free public transport participated in the survey. Cases with data gaps greater than 30% were removed from the analysis. Ultimately, after cleaning procedures, 788 respondents were qualified for analysis.

The collected material was subjected to quantitative and descriptive analysis. Data concerning numerical variables were processed using descriptive statistics, while qualitative variables were presented by providing the number and percentage distribution of individual categories. The conformity of the quantitative variables under consideration with the normal distribution was tested using the Shapiro–Wilk test. The Kruskal–Wallis test was used for ratio variables. The value of this statistic was calculated based on the formula:

$$H = \frac{12}{n(n+1)} \sum_{i=1}^k \frac{T_i^2}{n_i} - 3(n+1) \quad (1)$$

where $n = n_1 + n_2 + \dots + n_k$, and T_i ($i = 1, 2, \dots, k$) denotes the sum of ranks in each sample separately. The above statistic has an asymptotic χ^2 distribution with $k-1$ degrees of freedom.

Spearman's rank correlation coefficient was calculated using the following formula:

$$r_s = 1 - \frac{6 \sum_{i=1}^n d_i^2}{n(n^2 - 1)} \quad (2)$$

where d_i denote the differences between the ranks of corresponding feature values. Results with a p -value less than 0.05 were considered statistically significant. The analyses were performed using Statistica software version 13.3 PL.

3. RESULTS

3.1. Age and support for free public transport

A significant relationship was found between the age of the respondents and their preferred form of public transport (Kruskal-Wallis test: $H(3, N = 788) = 14.32$; $p < 0.01$; $E_R^2 = 0.02$). Post hoc results indicate that those who preferred free transport for city residents were more likely to be from older age groups than those who preferred free transport only

for selected groups ($p < 0.01$). The youngest group of respondents (age 18 to 26) were less likely to choose the option ‘free for all city residents’ (31.66%) than those in the older age groups (43.80% to 49.22%). At the same time, they were more likely to support limiting free travel to selected groups only (20.10% vs. a maximum of 9.85% in the other groups (Table 1).

Table 1.

Relationship between the age of the respondents and their support for free public transport

		Age										Kruskal–Wallis test	E_R^2	Post hoc			
		18–26 (n = 199)		27–35 (n = 127)		36–44 (n = 193)		45–53 (n = 137)		≥ 54 years (n = 132)							
		n	%	n	%	n	%	n	%	n	%						
Support for free public transport	Free for all city residents	63	31.66	59	46.46	95	49.22	60	43.80	64	48.48	$H(3, N = 788) = 14.32; p < 0.01$	0.02	Free for all city residents > Free for selected groups ($p < 0.01$)			
	Free for all interested parties	84	42.21	51	40.16	64	33.16	58	42.34	48	36.36						
	Free for selected groups	40	20.10	8	6.30	15	7.77	10	7.30	13	9.85						
	Communication should be paid for	12	6.03	9	7.09	19	9.84	9	6.57	7	5.30						

3.2. Age and reduction in the use of other means of transport

The analysis showed a significant relationship between the age of the respondents and the declared change in the use of other means of transport after the introduction of free public transport (Kruskal-Wallis test: $H(3, N = 698) = 35.31; p < 0.001; E_R^2 = 0.05$). Post hoc results indicate that people who reduced their car use were more likely to belong to older age groups than those who did not make any changes. Respondents aged 18 to 26 years were significantly less likely to report reducing their use of a car (42.69%) than older people (60.92 to 74.60% in older age groups). At the same time, younger people were more likely to report no change (31.58% vs. 8.33–20.69% in older age groups) (Table 2).

Table 2.

Relationship between the age of the respondents and their reduction in the use of other means of transport after the introduction of free public transport

		Age										Kruskal–Wallis test	E_R^2	Post hoc			
		18–26 (n = 171)		27–35 (n = 119)		36–44 (n = 174)		45–53 (n = 126)		54 years (n = 108)							
		n	%	n	%	n	%	n	%	n	%						
Restriction on the use	Car – restriction	73	42.69	83	69.75	106	60.92	94	74.60	80	74.07	$H(3, N = 698)$	0.05	Car – restriction > No			

of other means of transport	Other – restriction	27	15.79	10	8.40	13	7.47	10	7.94	13	12.04	= 35.31; p < 0.001	change (p < 0.001)
	No restrictions	17	9.94	10	8.40	19	10.92	8	6.35	6	5.56		
	No change	54	31.58	16	13.45	36	20.69	14	11.11	9	8.33		

3.3. Professional status and assessment of the effects of free public transport

Kruskal-Wallis test was again used to analyse the impact of professional status on the assessment of the effects of introducing free public transport. Significant statistical differences were found in the evaluation of most effects, although not all of them were confirmed in post hoc analyses.

For the assessment of the improvement in the quality of services provided, significant differences were observed between the groups ($H(5, N = 788) = 17.90$; $p < 0.01$; $E_R^2 = 0.02$). Post hoc analysis showed that self-employed people rated this aspect significantly lower ($M = 3.49$; $SD = 1.60$) than full-time employees ($M = 4.08$; $SD = 1.36$).

In the case of the evaluation of the reduction of exhaust emissions, the differences also proved to be significant ($H(5, N = 788) = 20.92$; $p < 0.001$; $E_R^2 = 0.03$). Pupils and students rated this impact significantly lower ($M = 3.36$; $SD = 1.51$) than full-time employees ($M = 3.74$; $SD = 1.33$).

The test result was also significant for the reduction of social inequalities ($H(5, N = 788) = 29.00$; $p < 0.001$; $E_R^2 = 0.04$). Post hoc analysis showed that pupils and students rated the impact significantly lower ($M = 3.07$; $SD = 1.36$) than full-time employees ($M = 3.67$; $SD = 1.37$) and retirees/pensioners ($M = 3.91$; $SD = 1.20$).

In terms of transport system overload, the differences were significant ($H(5, N = 788) = 13.63$; $p < 0.05$; $E_R^2 = 0.02$), but post hoc analysis showed only a difference between pupils/students ($M = 2.92$; $SD = 1.33$) and full-time employees ($M = 2.48$; $SD = 1.24$). Similarly, for irresponsible use of transport, the test was significant ($H(5, N = 788) = 18.75$; $p < 0.01$; $E_R^2 = 0.02$), and the post hoc difference concerned pupils/students and full-time employees; in the former group, the risk of irresponsible use was rated higher ($M = 2.70$; $SD = 1.34$) than among full-time employees ($M = 2.29$; $SD = 1.27$).

Statistical significance was also demonstrated for the following aspects: more people travelling to work by public transport ($H(5, N = 788) = 12.22$; $p < 0.05$; $E_R^2 = 0.02$), more people using public transport to go shopping ($H(5, N = 788) = 15.86$; $p < 0.01$; $E_R^2 = 0.02$), reduction of urban noise ($H(5, N = 788) = 17.30$; $p < 0.01$; $E_R^2 = 0.02$), savings for residents ($H(5, N = 788) = 12.28$; $p < 0.05$; $E_R^2 = 0.02$) and increased city attractiveness ($H(5, N = 788) = 13.73$; $p < 0.05$; $E_R^2 = 0.02$), where the post hoc test did not reveal any significant differences between pairs of groups, but the analysis of mean scores suggests that these effects were rated lower among the unemployed, pupils and students, and the self-employed.

Other aspects (reduced traffic from other vehicles, greater accessibility to transport, increase in number of passengers, significant costs to the city budget, decline in the popularity of alternative forms of transport) did not show significant differences between groups in terms of professional status ($p > 0.05$).

3.4. Education and agreement with the motive of promoting innovation as the reason for the reform

The results of the analysis indicate that there is no significant relationship between the level of education and the agreement with the motive for introducing free public transport in the form of promoting innovation (Spearman: $R = 0.06$; $t(N-2) = 1.76$; $p < 0.079$). The lowest level of agreement was expressed by respondents with primary education ($M = 3.09$; $SD = 1.54$), while the highest was expressed by those with higher education ($M = 3.7$; $SD = 1.39$). In the vocational and secondary education groups, the average levels of agreement were similar ($M = 3.61$ and $M = 3.57$). Although the differences did not reach statistical significance, the results suggest that people with primary education were slightly less likely to see the innovative potential of free public transport (Fig. 1).

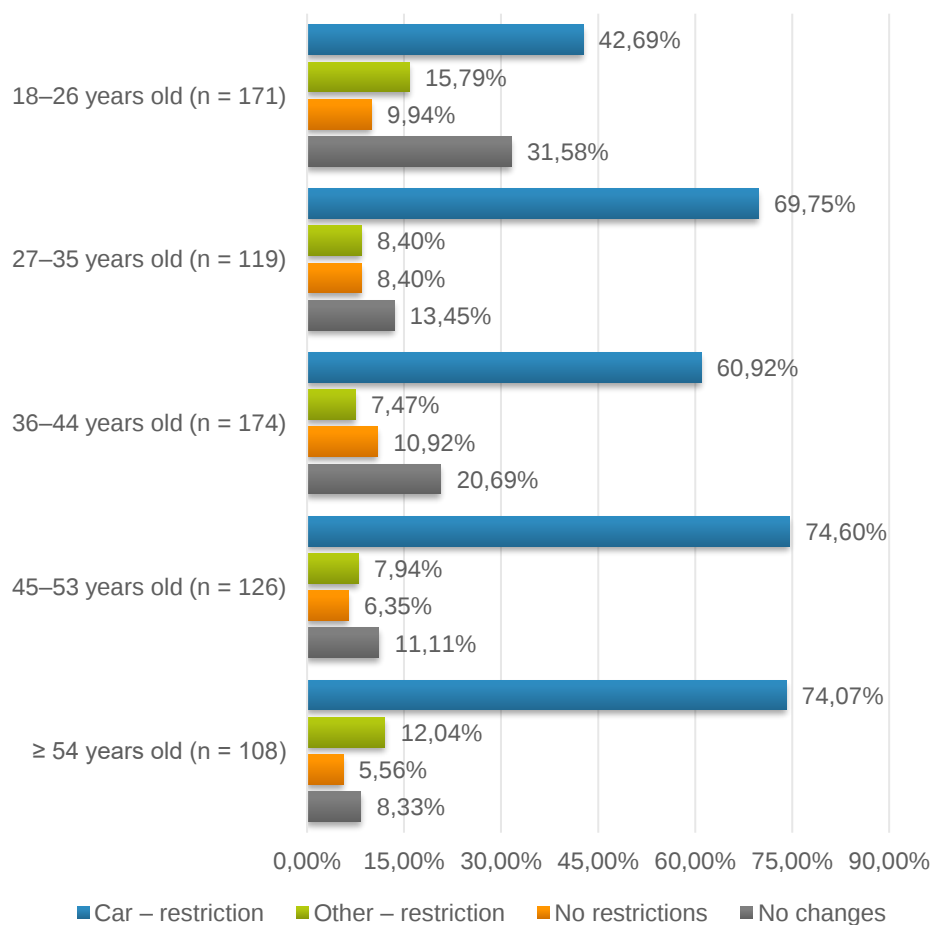


Fig. 1. Reduction in the use of other means of transport after the introduction of free public transport, broken down by age of respondents

4. DISCUSSION

The fact that those who preferred free transport for city residents were more likely to be from older age groups may be surprising, given the numerous comments made by young people on internet forums. Perhaps – which requires further research – this is due to the simple fact that older people who are already retired use free transport to get to the doctor, hospital, or to visit their loved ones, and therefore the introduction of free transport is particularly important for this group.

Older people were more likely to say that they had reduced their car use. However, it should be noted that the greater the increase in the frequency of public transport use after it became free, the more frequent the declarations of reduced use of alternative means of transport – especially cars, but also scooters, bicycles, and kick scooters – which is consistent with previous studies (Tomanek, 2017). Therefore, it is difficult to speak of a clear environmental effect related to the reduction of CO₂ emissions.

The results of the study indicate that there is no significant correlation between the level of education and the motive for introducing free public transport in the form of promoting innovation. This raises the question of what this innovation would consist of. This question hides a second dimension: it is more about whether respondents perceive free transport as something new, unusual, separate from political motives. The political motive aroused the greatest disagreement. Although 32.74% of the respondents strongly agreed with the statement that the decision was political in nature, nearly one in four expressed the opposite view – 23.73% strongly disagreed. A significant percentage of "difficult to say" responses (19.04%) may indicate an ambiguous perception of the intentions of decision-makers. Political motivations are attributed to specific individuals or social groups. While in the case of free public transport for seniors, it can be argued that this is socially justified, doubts may arise as to whether all individuals should be exempt from the fee. This is especially true given that the so-called free transport is implemented at the expense of other items in the city budget. The question therefore arises as to the extent to which those deciding to introduce this form of public transport, especially before important elections, such as local government elections, intend to "buying" votes of dwellers in this way. From an ethical perspective, such issues require further research. Research also points to a surprisingly low level of knowledge among students about the impact of communication on the environment. This indicates either indifference to the changes taking place or, more worryingly, a decline in environmental awareness.

5. CONCLUSION

Those who preferred free transport for city residents were more likely to be older age groups. They also more frequently declared that they already use other means of transport frequently. People who preferred free transport for city residents were more likely to be in older age groups than those who preferred free transport only for selected groups. At the same time, they were more likely to support the limitation of free travel to selected groups. Research suggests that free transport is more popular among older people, but we don't know whether such a solution contributes to environmental effects (e.g., do these people give up their cars?). It is also clear that respondents recognise the problem of distributive justice, recognising that free transport shouldn't be for everyone. Employed people and pensioners were more likely to see the positive effects of free public transport, such as improved service quality, reduced emissions, and noise reduction. On the other hand, the unemployed, students, and the self-employed were more likely to be sceptical about these effects. For example, when it comes to assessing the reduction of exhaust emissions, the differences also proved significant. Students rated this impact significantly lower than full-time employees. Additionally, students rated the impact significantly lower than full-time employees and retirees. These research results confirmed our assumptions about the importance of values and knowledge on environmental aspects. Most of the employees who work in manufacturing companies have knowledge of how environmental management systems operate. People with basic education were slightly less likely to see

the innovative potential of free transport. The political motive sparked the greatest controversy. Although the respondents strongly agreed that the decision was political in nature, almost one in four expressed the opposite view. These assessments reflect a division that stems from support for candidates for the mayor's office. Free public transport was introduced before the end of the outgoing mayor's term (due to lower public support).

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