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TRANSPORT INFRASTRUCTURE AND MOBILITY EXCLUSION IN URBAN AND SUBURBAN AREAS: THE CASE OF POLAND

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Abstract: The aim of this study is to examine the impact of road infrastructure on the phenomenon of transport exclusion in Poland, with particular emphasis on urban, suburban, and rural areas. The article seeks to identify key issues related to limited access to public transportation and its quality, as well as to highlight infrastructural factors contributing to social marginalization. The main arguments presented indicate that the lack of adequate transport connections, the low quality of existing infrastructure, and the insufficient availability of public transport services lead to the marginalization of certain social groups. A significant component of the study involves the presentation of effective solutions implemented in other countries and the formulation of recommendations that may enhance transport accessibility in Poland. The article is based on the analysis of secondary data, a review of scientific literature and reports, and is supplemented with the authors' own observational findings.
Keywords:transport exclusion, public transportation, road infrastructure, social mobility

1. INTRODUCTION

Road infrastructure constitutes an essential component of the transport network, which is utilized daily by various modes of transportation. In urbanized areas, infrastructure plays a pivotal role in shaping the social life of citizens across different age groups. It encompasses not only road networks, which are part of linear infrastructure, but also facilities such as transport hubs, bus and tram stops, service stations, and transshipment points—collectively referred to as point infrastructure.

Depending on the level of technological development and the involvement of various public authorities in investments aimed at modernizing and expanding infrastructure, there are significant disparities in access to basic means of transport and communication across Poland. A considerable number of areas, particularly those located beyond the administrative boundaries of cities, remain isolated from full participation in social life—an essential right guaranteed to every citizen by the Constitution of the Republic of Poland.

Access to efficient and well-developed road infrastructure is one of the key determinants of the quality of life for residents of urban and suburban areas. The problem of transport exclusion stems from inadequate transport connections, an insufficient number of public transport services, and the poor condition of existing infrastructure. Therefore, the primary

objective of this paper is to examine the impact of road infrastructure on the phenomenon of transport exclusion in Poland, with particular emphasis on urban, suburban, and rural areas. The authors aim to highlight the key issues associated with limited access to and the quality of public transport, as well as to identify infrastructural factors that contribute to social marginalization.

2. TRANSPORT EXCLUSION – LITERATURE REVIEW

Social exclusion in the context of limited transport capabilities primarily refers to the loss of access to employment opportunities and essential services, both of which are necessary for active participation in society. This condition is characterized by individuals' inability to engage in daily activities, often resulting in the phenomenon of "forced car ownership" (Żmuda-Trzebiatowski, 2016). Social exclusion is rooted in broader issues of discrimination and marginalization, which are historically linked to poverty and socio-economic stratification, shaped over decades by national political systems and public policy. Transport exclusion, therefore, emerges as both an infrastructural and systemic issue (Hoff & Izdebski, 2021; Andrzejewska et al., 2024).

According to data published by UNICEF in 2023, as many as 15 million people in Poland experience some form of transport exclusion, including the youngest group—children. This may have a direct impact on their mental well-being (Mackett& Thoreau, 2015; Glazener et al., 2021). Public transport plays a key role in ensuring mobility and social inclusion, as it enables individuals to function freely within society (Ali et al., 2021; Białobrzeska, 2022). The issue of transport exclusion is generally understood as the limitation or lack of access to public transportation services (UNICEF, 2023).

Transport exclusion is closely tied to the mismatch between transport needs and the services provided at the local government level. It is also exacerbated by insufficient funding and limited support from central government institutions (Dong et al., 2021). Despite its importance, transport is often marginalized in broader discussions on social inequality and exclusion (Dharmowijoyo, 2020). Moreover, new infrastructure investments do not always alleviate transport exclusion (Eckersten et al., 2023); in many cases, the routing and location of transport hubs prevent effective connectivity between expressways and adjacent municipalities. Infrastructure intended to improve connectivity can inadvertently deepen exclusion (Prus & Sikora, 2021; Luz & Portugal, 2022), particularly when it disrupts established settlement patterns. Expressways can create barriers to essential services, including access to healthcare, government institutions, and educational facilities.

Transport exclusion is also a problem of fragmented responsibility (Chmielewski et al., 2022). In rural municipalities, local authorities manage public transport within their limited capacities. However, high school students who wish to continue education outside their municipality often face severe limitations due to the lack of personal vehicles and the absence of direct connections between neighboring communities. The lack of inter-municipal cooperation and the shortage of funds for expanding the layers of public transport systems continue to reinforce the issue. To date, only a small percentage of municipalities have implemented modern transport concepts such as park-and-ride systems or car-sharing solutions (Robleki et al., 2021).

Municipalities should first capitalize on the potential of expressways by collaborating with relevant administrative bodies to create bus hubs and additional transit stops. Often, public transport providers operate at a loss, and the concept of public transport is

inherently associated with financial deficits. In such cases, subsidies from local governments are essential and should be prioritized as a key strategy for combating transport exclusion in rural communities (Lack of Funding, 2019).
The sources of transport needs are influenced by a variety of factors, as illustrated in Figure 1. These factors define the core areas of social life and the basic needs required for the proper functioning of the economy. In urban areas, the primary transport demands relate to commuting to work, educational institutions, and business activities. Transport needs can also be analyzed in the context of freight movement, business operations, or political activities. Depending on the location of enterprises, transport demand will vary across different units. Additionally, event locations, demographic trends, and population density also influence the demand for public transport services in urban areas (Mądziel, 2016).

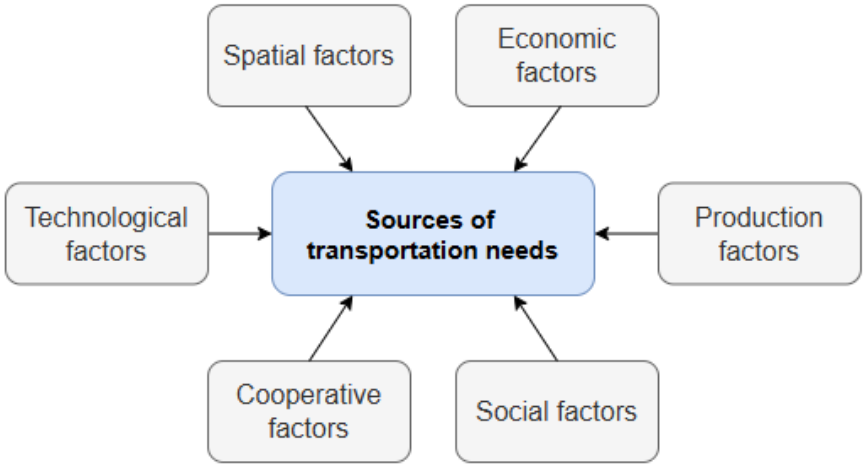

Fig. 1. Categories of Transport Demand Sources

Transport accessibility plays a significant role in the economic development of a country. In this context, accessibility is understood in terms of time and cost dimensions (Pot et al., 2024)—it increases as the time and financial costs required for commuting along frequently used routes decrease. Consequently, low accessibility results in higher operational costs for conducting business in such areas. It is therefore essential that investments in transport infrastructure are allocated effectively. Undoubtedly, infrastructure investments in the transport sector have a substantial impact on improving the financial performance of economic entities (Tomczyk, 2020).
Another critical issue is the problem of transport poverty (Białobrzeska, 2022), which can be defined as a state of limited mobility. The lack of a private vehicle, combined with inadequate access to public transport, may result in the inability to access goods, services, or life opportunities, ultimately leading to social exclusion. Frequently, the absence of car ownership, when coupled with the dismantling of public transport networks, leads to spatial isolation. This, in turn, influences residents' decisions and affects their overall quality of life.
Considering infrastructure and the broader issue of exclusion, researchers have developed various indicators of accessibility, such as travel time, road distance, the Road Transport Accessibility Index (RTAI), the spatial reach of transit stops, and the potential for social and economic interactions. RTAI measures transport accessibility based on the

road network, taking into account factors such as road density, road quality, and travel time to key locations such as urban centers or service facilities (Komornicki, Rosik, Stępniak et al., 2018).
Clearly, the elimination of public transport connections within municipalities significantly contributes to transport exclusion (Orchowska, 2021).
Road infrastructure and its accessibility are also closely linked to innovation in the context of economic growth. The development of road infrastructure has a direct impact on investment activities within a given area. It contributes to the reduction of travel time—resulting in lower transport costs—as well as the improvement of safety and transport conditions. Accessibility, in turn, enhances the overall attractiveness of travel.
Improvements in road infrastructure translate not only into greater transport efficiency but also into increased reliability. On a national scale, such improvements can contribute to enhanced competitiveness due to reduced travel and logistics costs. Among the socio-economic consequences of expanding road infrastructure is the potential relocation of residents and businesses to newly accessible transport hubs.
The development of transport infrastructure and the advancement of innovation are complementary categories. The creation of new infrastructure stimulates regional development and serves as an incentive for potential investors. It also enables a given area to be better integrated into broader operational zones within logistics chains.

3. RESEARCH METHODS

The article is based on the desk research method, which includes the analysis of scientific literature and numerous reports and studies, mainly concerning the years 2016–2024. Data comes from scientific articles, as well as from reports of institutions such as the European Commission and the Central Statistical Office. A narrative review was used, taking into account current and relevant sources relating to road infrastructure and transport exclusion in Poland. The paper attempts to verify three research problems: whether the lack of appropriate transport infrastructure leads to social exclusion; whether the mismatch of transport investments to the actual needs of residents can deepen the problem of transport exclusion; and whether the increase in social mobility and economic development are dependent on the availability of transport, and its lack can lead to stagnation and marginalization of selected regions. The spatial scope of the study includes urban, suburban and rural areas in Poland. The analysis is supplemented by the author's own observations, conducted in the years 2016–2024 in selected municipalities of the Czestochowa district, regarding the condition of the stop infrastructure and the functioning of local public transport.

4. CHARACTERISTICS OF THE ROAD NETWORK IN URBAN AND SUBURBAN AREAS

In urban areas, the road infrastructure is relatively well-developed; however, it often faces challenges related to congestion and traffic overload. Implementing solutions to improve vehicle flow and integrating public transportation with the road network represent key challenges in the context of urban mobility.
In contrast, suburban areas are characterized by a lower number of transport connections, which limits residents' mobility and restricts their access to essential services.
Differences between medium- and highly-urbanized areas are reflected in average travel distances, influencing settlement patterns and transport behaviors. The mobility of urban

residents depends on the size of urban centers, the occupational structure of the population, the availability of public transport, and the degree of industrialization. Transport needs can be classified into obligatory (related to work, education, and healthcare) and optional or incidental (related to tourism, shopping, and leisure activities). In 2017, an increase in the number of passengers was recorded across all modes of public transportation in Poland, with the exception of road-based transport. Passengers tended to travel longer distances—excluding maritime transport—which contributed to a rise in transport work dynamics within passenger services (GUS, 2017).

Despite the ongoing development of the road network in Poland, numerous challenges remain regarding the adaptation of infrastructure to meet growing transport demands (Domańska, 2006). According to research conducted by the TomTom Traffic Index (2024), Wrocław had the longest average travel time over a 10-kilometer distance during peak hours among Polish cities, reaching nearly 29 minutes. In Poznań and Łódź, the average times were approximately 27 and 26 minutes, respectively.

Compared to the previous year, improvements were observed in four Polish cities, including Warsaw, where the average travel time decreased by 3%. In contrast, Katowice, which continues to have the shortest average travel time, saw an increase of 3.7%.

In terms of road congestion levels, Łódź recorded the highest congestion index in Poland, at 48%, placing the city among the top positions in global rankings. Compared to the previous year, congestion in Łódź increased by 8.2% (TomTom Traffic Index, 2024).

Transport infrastructure investments in Poland are financed through both national funds and European Union resources. Modernization programs play a crucial role in this context, encompassing the improvement of road surface quality, the construction of new expressway sections, and the development of public transportation systems.

According to a 2020 report by the General Directorate for National Roads and Motorways (GDDKiA), among roads managed by the agency, 64.1% of road surfaces were classified as being in good condition, 25.1% were in a warning state, and 8.2% were assessed as being in poor condition (Report on the Technical Condition, 2021).

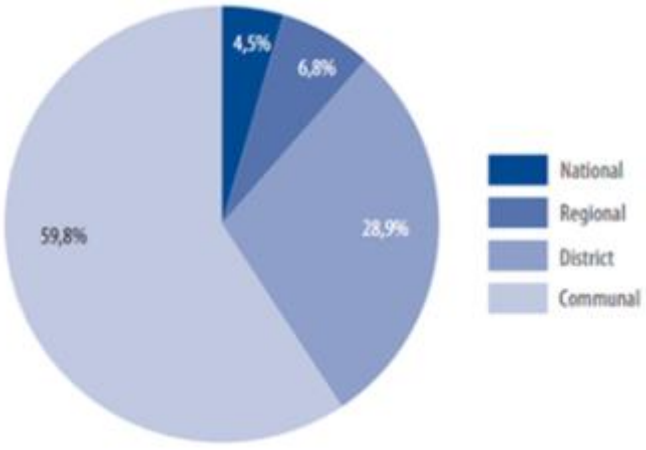

Fig. 2. Structure of Public Roads as of December 31, 2021

Figure 2 illustrates the distribution of all public roads in Poland as of 2021. According to data from Statistics Poland (GUS), municipal roads constitute the majority, accounting for 59.8% of the total road network. The second-largest share belongs to county roads, representing 28.9%. These are followed by voivodeship roads at 6.8%, while national

roads make up only 4.5% of the entire road infrastructure. The General Directorate for National Roads and Motorways has emphasized the significant role of municipalities as local government units responsible for maintaining the majority of the road network, as over half of all roads in the country fall under their jurisdiction.
Following Poland's accession to the European Union in 2004, the country began acquiring EU funds, significantly increasing investments in infrastructure development—a process that continues to this day as a benefit of EU membership. However, despite these financial contributions, the pace of investment implementation remains insufficient in light of the growing mobility demands.
Some voivodeships continue to struggle with infrastructure issues, with a high percentage of roads in need of modernization still present in their regions (Report RBF, 2021).

5. INFRASTRUCTURE BARRIERS TO TRANSPORT ACCESSIBILITY

Transport and communication are key components of both linear and point infrastructure, fundamentally shaping spatial and social accessibility. The quality of the transport system largely depends on the actions of local government authorities, whose responsibilities include ensuring effective mobility for residents and allocating adequate financial resources for the development of public transport and road infrastructure (Hoff & Izdebski, 2021; Andrzejewska et al., 2024). In practice, however, this process encounters numerous administrative, financial, and organizational barriers, which significantly limit transport accessibility—particularly in peripheral areas.
Transport Accessibility and Regional Disparities in Poland
Transport accessibility in Poland—especially when compared to regions of the "old" European Union—remains relatively low, particularly in the eastern parts of the country and in smaller, economically underdeveloped towns. Enhancing transport inclusivity in these regions requires the development of bus connections. The sustainable development of the country is dependent on an efficient transport system, which cannot operate without well-organized transport infrastructure (Czernicki et al., 2019).Demographic changes and intensified migration toward cities have resulted in the gradual degradation of smaller towns and rural areas. Local government decisions often focus on regions with greater economic potential, leading to the marginalization of transport infrastructure in peripheral areas. As a consequence of population decline, municipal budgets shrink, reducing spending on road infrastructure, lighting, and public transport operations. This often results in the elimination of bus routes, and launching new services becomes unprofitable due to low passenger demand (Kaczorowski, 2019).
The liquidation of bus connections in the 21st century has become a significant issue, particularly in sparsely urbanized areas. Despite numerous legislative initiatives and legal amendments, the problem continues to intensify. One key factor has been the rise of private transport operators, which gradually replaced state-owned enterprises such as the State Motor Transport Company (PKS). Due to an inability to adapt to new market conditions and increasing operational costs, PKS lost its profitability, leading to the mass cancellation of routes and the eventual collapse of many of its branches. The decline in interest in public transport was further accelerated by the rising number of private vehicles, resulting in a reduction of bus passengers by up to 50% since 2004.
Data show that approximately 60% of municipalities in Poland do not organize public transport within their territories. Local governments prioritize maintaining profitable routes, while unprofitable connections are gradually phased out. According to the Polish Academy

of Sciences, over 20% of villages (sołectwa) are completely deprived of public transport, and in many localities, there are only two bus departures per day (Rosner, Stanny, Komorowski, 2018).Research conducted by the Institute of Geography and Spatial Organization of the Polish Academy of Sciences (IGiPZ PAN) revealed that 28% of respondents reported difficulties commuting to work due to transport limitations caused by the closure of regional rail services (Taylor, 2007). As a result, county towns are losing their functional roles, and transport exclusion continues to contribute to the marginalization of peripheral regions (Kaczorowski, 2019).

The absence of strategic investment in the development of public transport has resulted in a situation where local governments prioritize the construction of new roads over the modernization of existing transport systems. Due to the higher short-term visibility of road infrastructure projects, many municipalities choose to implement such initiatives, even though they fail to address the issue of transport exclusion. An additional challenge is the limited availability of modern forms of transport, such as car-sharing systems or park-and-ride concepts (Robleki et al., 2021), which could otherwise significantly enhance transport accessibility.

Deficiencies in public transport lead to restricted mobility, especially among socially vulnerable groups, such as elderly people. According to research from the Institute of Rural and Agricultural Development of the Polish Academy of Sciences, roughly one in five rural residents in Poland is of post-working age. For seniors living in rural areas, bicycles often serve as the primary means of transport—a form of adaptation rather than choice.

Transport exclusion, and the subsequent reliance on alternative means of communication, is influenced by factors such as inadequate transport route networks for the elderly and poorly adapted point infrastructure, particularly bus stops. Moreover, older individuals often avoid bicycle paths, and cultural norms continue to marginalize women's use of cars (Michalska, 2025). Transport exclusion in Poland remains a significant challenge, especially in rural and suburban areas. Continued marginalization of public transport may further deepen social inequalities, limit access to public services, and contribute to the functional decline of many regions.

6. BEST PRACTICES IN ROAD NETWORK PLANNING AND MODERNIZATION

The modernization of road networks and the development of integrated transport systems constitute a key element of urban infrastructure management. The implementation of intelligent traffic management technologies (Durand et al., 2022), along with collaboration between the public and private sectors, contributes to reducing the issue of transport exclusion. Appropriate spatial planning and the use of modern analytical tools allow for the optimal utilization of existing road infrastructure and enable the anticipation of future urban transport needs.

Urban logistics focuses on the optimization of transport systems, the integration of modern tools that support flow management, and the promotion of environmentally friendly solutions. Public transport, supported by Smart City technologies, allows for more efficient traffic control. Intelligent Transport Systems (ITS) (Garg & Kaur, 2023), public transport prioritization, and the development of car-sharing and urban bike-sharing schemes are essential components in enhancing the functionality of urban mobility. A practical example of ITS implementation can be observed in Poznań, where priority systems for trams and buses are actively used. According to analyses conducted by Transport & Environment

(2017), a single shared vehicle can replace up to ten private cars. Replacing this number of vehicles contributes to increased efficiency in urban logistics and ensures greater punctuality in public transport services. The implementation of smart traffic signal systems and traffic volume monitoring helps to increase transport fluidity and reduce congestion.
To reduce congestion, traffic management systems are being implemented, such as low-traffic zones, underground tunnels for passenger vehicles, and park-and-ride systems. Strict parking policies and restrictions on the entry of high-emission vehicles have proven effective in decreasing traffic density. An example of effective traffic management can be seen in cities that implement dedicated lanes for public transport, which improves traffic flow and encourages residents to shift away from private car use. Moreover, investments in cycling infrastructure and pedestrian-friendly transport contribute to the development of a sustainable mobility system. It is essential that these systems are integrated, community-friendly, and actively promoted (Jurczak, 2019).
Measures aimed at supporting logistics flows in cities often focus on diverting traffic away from central zones. These so-called push measures stand in contrast to pull strategies that attract traffic into city centers. Examples of push measures include underground tunnels for passenger cars, which increase the surface road capacity for freight vehicles, buses, and trams. Another effective push strategy is the construction of bypass roads, intended to redirect transit traffic away from city centers toward outer districts or neighboring municipalities. The rotational parking system can help optimize the use of urban centers and parking facilities. Measures that reduce congestion in dense urban areas also include strict pricing policies for central parking zones. Furthermore, the introduction of low-traffic zones and 30 km/h speed zones represent technical and visual solutions that can dynamically enhance logistical throughput. On the other hand, pull measures—those that encourage people to travel into city centers—can enhance user convenience and comfort from the perspective of urban road users. These include public transport modernization, the creation of dedicated lanes for public transport, integration of different transport modes via urban mobility cards, park-and-ride and park-and-bike systems, as well as improved access to stops and enhanced safety in city centers. However, such measures may counteract efforts to reduce congestion, as they encourage entry into urban zones. While this is not inherently negative, it must be balanced carefully so as not to undermine broader goals of improving logistics flow efficiency and maintaining sustainable urban traffic dynamics (Nowakowska, 2016; Sokołowicz&Przygodzki, 2015).
A sustainable mobility strategy takes into account the development of alternative forms of transport, such as electric micromobility and autonomous Personal Rapid Transit (PRT) vehicles (Elkameli et al., 2021). Integrated urban tickets and mobile information applications are tools that support eco-mobility chains. The European Commission emphasizes the optimization of transport through the development of the Trans-European Transport Network (European Commission, 2021). The introduction of financial incentives for public transport users, including ticket subsidies or investments in environmentally friendly vehicle fleets, is becoming an essential element of modern transport policy (van Wee et al., 2023).
An example of effective infrastructure modernization is the construction of intermodal transport hubs, such as those in Czestochowa, where transfer centers have been established to integrate public and private transport. Similar projects improve transport accessibility and help reduce transport exclusion in suburban areas.

Equally important is the implementation of intelligent traffic management systems on major urban arteries, which enable dynamic traffic flow control and help minimize the negative effects of congestion.

7. ROAD INFRASTRUCTURE DEVELOPMENT STRATEGIES FOR MITIGATING TRANSPORT EXCLUSION

Transport efficiency requires a holistic approach that involves the integration of activities across various stakeholders and effective management of the transport space. A key responsibility of local authorities is the implementation of both infrastructural and systemic solutions that enable residents to move efficiently within and between urban areas. In urban contexts, Intelligent Transport Systems (ITS) (Njoku et al., 2023; Garg & Kaur, 2023) play a crucial role in traffic optimization. These systems utilize satellite navigation, sensors, and video monitoring to analyze and regulate traffic intensity. As a result, they enable more effective management of traffic flows, delay reduction, and automated response to road incidents. The Smart City concept, based on the implementation of advanced telematics systems, allows for real-time data processing, which supports both traffic management and the safety of passenger and freight transport.

The development of Artificial Intelligence (AI) and the Internet of Things (IoT) opens new perspectives for the optimization of urban transport systems (Durand et al., 2022). The implementation of decision-making systems based on the analysis of multidimensional data sets allows for more effective route planning, congestion reduction, and enhanced efficiency of public transportation (Durand et al., 2023). Transport and logistics companies can reduce the number of so-called empty runs, thereby optimizing operational costs and minimizing pollutant emissions. At the same time, public transport operators should focus on increasing the attractiveness of their services by improving passenger service standards, implementing marketing strategies, and promoting environmentally friendly transport solutions. In the long term, the popularization of public transport contributes to reducing the dominance of individual car use, which in turn helps to alleviate urbanization-related challenges, such as congestion and environmental degradation (Eckersten et al., 2023).

An important aspect of combating transport exclusion is the adaptation of road infrastructure to the needs of public transportation. The standardization of timetables to ensure optimal service frequency is a key condition for improving the efficiency of transport systems. This issue should be overseen by both national administrative bodies and European institutions, which have the capacity to coordinate transport policies at a supranational level.

European metropolitan areas are implementing modern solutions to improve the efficiency of public transport. One example is the SCATS system (Sydney Coordinated Adaptive Traffic System) (Kustija, 2023), which uses dynamic traffic signal control to grant priority to public transport vehicles at intersections. Similar solutions could be implemented in Polish cities to increase the competitiveness of public transport compared to private car use. The optimization of passenger flows is also made possible through mobile applications that provide real-time information on traffic intensity, estimated travel times, and available transport alternatives.

A fundamental condition for improving the efficiency of transport systems is the implementation of a sustainable mobility strategy, aimed at adapting infrastructure and modes of transport to the actual needs of residents. Transport systems should take into

account technological, social, and economic aspects, enabling long-term improvements in urban quality of life. An important element in reducing congestion includes parking fee policies, the development of remote work models, fuel cost optimization, and the implementation of alternative propulsion technologies. The introduction of time-based and permanent traffic restrictions for heavy vehicles serves as a tool for congestion reduction, while simultaneously encouraging transport substitution by promoting the use of public transportation.

Among the recommended measures, it is worth highlighting the Road Pricing system, which links the cost of road use to traffic intensity levels (Shatanawii et al., 2022). The development of urban logistics research and the implementation of modern transport technologies may contribute to mitigating the negative effects of infrastructure congestion. An important tool for addressing transport exclusion remains the Bus Transport Development Fund, aimed at supporting public utility transport services in non-urban areas while simultaneously reducing transport deficits in medium-urbanized regions.

It is recommended that public authorities ensure a close correlation between service frequency and the perceived quality of public transport, which could lead to greater social engagement in using this mode of transportation. Therefore, the expansion of service coverage requires financial support and the application of compensatory mechanisms to offset potential losses from unprofitable routes. This issue should be carefully analyzed by public administration bodies and transport management entities.

The relationship between transport exclusion and the need to adapt public transport systems to the actual needs of users is illustrated in Figure 3.

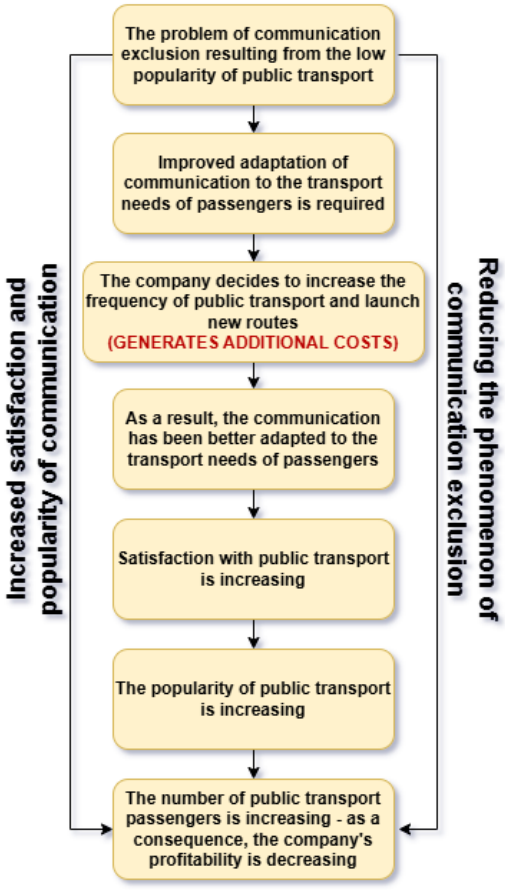

Fig. 3. Relationship Between the Increase in Public Transport Users and Improvements in Service Frequency and Quality

Figure 3 illustrates a relationship that highlights the importance of service frequency and the expansion of public transport routes in addressing transport exclusion. As public transport systems are increasingly tailored to the mobility needs of residents, user satisfaction rises, which in turn leads to greater popularity of this mode of transport. However, any changes aimed at increasing service frequency also result in higher operational costs for the institutions responsible for transport services. Therefore, one can conclude that reducing transport exclusion does not always align with profitability. Nonetheless, in the context of the broader issue of social exclusion, public transportation remains a top priority and a fundamental necessity—both in urban and moderately urbanized areas.

In the context of reducing transport exclusion, it is worth pointing out good practices implemented in some Polish cities. For several years, Rzeszów has been gradually expanding the network of bus connections and implementing facilities for people with disabilities. The city is also investing in tariff integration and new technological solutions, such as intelligent passenger information systems. In 2021, Rzeszów introduced an integrated transport ticket valid on urban and suburban lines, which significantly improved the accessibility of transport for residents of the surrounding municipalities (Polregio, 2021). For years, Gdynia has been consistently implementing a sustainable transport strategy. It includes, among others, the development of trolleybuses, preferences for low-emission vehicles and the expansion of transfer infrastructure. The city also conducts public consultations on the organization of transport, which allows for a better adjustment of the transport offer to local needs. This type of approach was indicated as a model in the RBF publication (2021), where Gdynia appears in the context of implementing urban mobility policies based on actual data and social dialogue (Gdynia City Hall, 2014).

Table 1. International comparison – selected countries of Central and Eastern Europe

Country	Examples of activities	Notes
Czech Republic	National regional transport subsidy system; extensive rail network connecting small towns	Tariff integration and regional transport plans
Slovakia	Modernisation of rail connections, including to peripheral regions; free travel programme for selected groups	Mainly aimed at students and seniors
Lithuania	Strengthening sustainable public transport, developing railways and improving regional integration	Transport as a tool to combat territorial inequalities
Hungary	Maintaining the rail network, even in sparsely populated areas	Profitability problems, but continued subsidies
Poland	Kolej+ Programme, Bus Development Fund, local mobility strategies	Lack of full system integration

Source: (European Commission, 2022), (Ministry of Transport and Construction of the Slovak Republic, 2023), (OECD, 2019), (Pucher, Buehler, 2021), (Report RBF, 2021).

Table 1 presents examples of countries from the Central and Eastern European region and their solutions to combat communication exclusion, as well as key problems resulting from this or potential benefits.

8. CONCLUSIONS FROM THE ANALYSIS AND INTERPRETATION OF RESEARCH PROBLEMS

The development of road infrastructure is essential to reduce transport exclusion and ensure equal access to public transport for residents of urban and suburban areas. The results of research conducted in Czestochowa County indicate an urgent need for reforms in the field of public transport and road investments. The Report on the State of Czestochowa County for 2023 reveals that expenditure on public transport amounted to PLN 9,565,838.36, which constituted 7.5% of the county's current expenditure (Report on the State of Czestochowa County, 2023). According to the analysis included in the article, the lack of appropriate transport infrastructure leads to social exclusion, especially among residents of suburban and rural areas. The limited transport offer, the elimination of bus connections and the lack of investment in the modernization of public transport make it difficult for many social groups, including seniors and people with lower incomes, to function on a daily basis. Limited mobility results in difficulties in accessing education, work and public services, which in the long term affects the quality of life of residents. Failure to adapt transport investments to the actual needs of residents leads to a further deepening of the problem of transport exclusion. Financial resources are often directed to road infrastructure for individual traffic, while the needs of public transport passengers remain marginalized. The lack of integration of various means of transport and failure to take into account regional specificity lead to the gradual degradation of peripheral areas, limiting their development potential and contributing to the outflow of population.

Social mobility and economic development are directly dependent on the availability of public transport. An insufficient number of bus and rail connections negatively affects the professional activity of residents and limits the investment attractiveness of regions. The lack of transport leads to socio-economic marginalization, hinders the development of local labor markets and weakens the functionality of county towns.

Summing up the way in which individual research problems are presented and supported by evidence, it can be clearly stated that the obtained results confirm their validity. In relation to the first research question, assuming that the lack of appropriate transport infrastructure leads to social exclusion, especially among residents of suburban and rural areas, the article showed that limited access to means of transport results in the inability to move freely, which in consequence hinders access to jobs, educational institutions, health care and other key services. The lack of an effective communication system not only limits the mobility of individuals, but also leads to their gradual marginalization. The second research problem, concerning the mismatch of transport investments to the real needs of residents and its impact on the deepening problem of communication exclusion, was also supported by numerous evidence. It was indicated that the insufficient pace of investment implementation, as well as their mismatch to dynamically changing mobility patterns, contribute to the increase in traffic congestion, especially in large agglomerations. Empirical data confirmed that some voivodeships are particularly affected by this phenomenon, which clearly indicates the uneven access to transport infrastructure and its impact on the level of social exclusion. The third research question, assuming that the growth of social mobility and economic development are directly dependent on the availability of transport, and its absence may lead to stagnation and marginalization of some regions, was confirmed in the analysis conducted in the article. The growth in the number of transport connections translates into both greater freedom of movement of residents and an increase in the investment attractiveness of individual cities and regions.

The data proves that a developed transport infrastructure is not only a factor favoring the mobility of individuals, but also an element attracting investment capital, which in the long term translates into economic growth and improved quality of life.

9. RECOMMENDATIONS

To counteract the negative effects of transport exclusion, it is necessary to implement a coherent and comprehensive transport policy that takes into account both the needs of residents and the spatial and demographic conditions of individual regions. A key element of such actions should be the integration of various means of transport - both public and private - in order to provide a real alternative to individual car transport.

An important direction of development is to increase investment in public transport infrastructure, especially in suburban and rural areas, which are particularly exposed to the phenomenon of transport exclusion. It is recommended to implement modern technological and organizational solutions, such as "park and ride" systems, car-sharing, transport on demand or digital applications supporting travel planning, which can increase the efficiency and availability of existing connections.

It is also necessary to conduct sustainable infrastructure planning that takes into account the real needs of local communities and adapts investments to the demographic and economic potential of a given area. Well-planned actions can contribute to increasing social mobility, improving spatial integration, equalizing development opportunities and reducing socio-economic marginalization in regions affected by transport exclusion.

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