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TRANSPORT POVERTY IN URBAN MOBILITY PLANNING

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Abstract

The development of the "Transport poverty" concept is based on availability, accessibility and affordability analysis of different transport options. Provided level of transport quality by proposed transport options is also considered, especially for certain categories of transportation system users. In addition to transport system quality parameters application of this concept also requires good quality databases on travel patterns and socio-economic characteristics of the population.

The current challenges facing the transport system can be treated by sustainable urban mobility planning. Air pollution emissions as a result of traffic, increase negative impact on health of urban residents and climate change. Insufficient level of analysis detail, wrong approach and lack of participative approach in urban mobility planning could lead to transportation system that is not custom-made for users. In this sense, the application of the Transport poverty concept would improve the quality of existing practice in the urban mobility planning.

This paper presents the essence of the concept of Transport poverty, as well as the possibility of integrating the basic postulates of this concept into the planning of sustainable urban mobility.

1. INTRODUCTION

The right to freedom of movement, education, and work should be equally ensured for everyone. Considering that these activities are often spatially dispersed, one of the key preconditions for fulfilling this is the ability to move or travel. Without sustainable and accessible transportation alternatives, people can be excluded from job opportunities, healthcare, social connections, and may be disadvantaged when it comes to shopping or accessing cultural activities, which all significantly affects their quality of life.

The definitions of transport poverty vary, but most commonly used is: Transport poverty is a state in which people are prevented from participating in the economic, political, and social life of the community due to reduced accessibility to opportunities, services, and social interaction [1].

Individuals are considered transport poor if they meet at least one of the following conditions: they have no transportation alternative that suits their needs; they cannot reach their destinations to fulfill their daily activities such as education, healthcare, and work; their weekly transportation expenses exceed the poverty threshold; travel time is long; travel conditions are unsafe, dangerous, or unhealthy.

The major factors that contribute to transport poverty include location, age, budget, and economic opportunities, making them "key indicators of transport poverty". Various approaches have been proposed regarding accessibility, affordability, mobility, and external effects criteria, which enable a more comprehensive understanding of the concept of transport poverty [2].

2. TRANSPORT POVERTY, TRANSPORT AFFORDABILITY, MOBILITY POVERTY AND ACCESIBILITY POVERTY

The following terms are presented to contribute to a better understanding of the concept Transport Poverty (Figure 1).

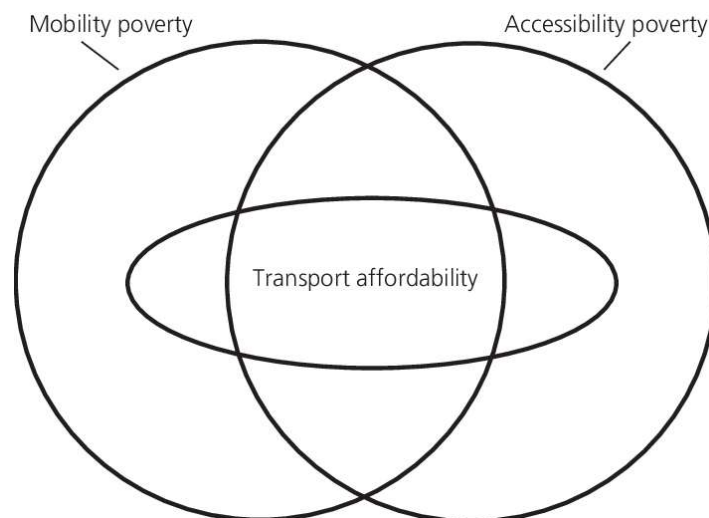


Figure 1. Transport poverty and related sub-concepts [3]

The definition of transport poverty, through **transport affordability**, which identifies car ownership as a basic household necessity, is only relevant within the context of hypermobility in developed countries. One interpretation is that transport poverty occurs when a household is forced to spend more on travel than it can reasonably afford, with particular consideration given to the costs associated with owning and using a car [4].

While the concept of transport affordability relates to the lack of individual resources to afford transportation needs, **mobility poverty** relates to a systemic lack of transportation and the absence of transport alternatives. In this case, there is a proven correlation between low income and mobility poverty. Larger investments in infrastructure generally do not cater to the needs of the poorest, as investments in transportation, backed up by economic growth, "tend to benefit the 'non-poor' most".

Accessibility poverty extends the concept of mobility poverty through additional considerations of whether people can easily reach their basic daily activities within a reasonable time and at reasonable costs. In developed countries, accessibility poverty has played a useful role in identifying social groups that lack the basic resources to be able to access key activities with the aim of improving their living conditions. If transportation is understood as a means to satisfy needs and rights, accessibility poverty acts to reproduce general conditions of poverty and is closely linked to social exclusion [3].

Transportation is considered an essential service, alongside water, energy, sanitation, financial services, and digital communication, to which everyone should have access, and thus, support is necessary for those without access [5].

One of the main barriers to better understanding the issue of transport poverty is the level of the available data required to research the problem in any meaningful and geographically specific way. Gathering such data is both time-consuming and costly, as it demands detailed analysis [6].

The population groups most exposed to the risk of transport poverty are individuals with low income, women, the elderly, persons with disabilities, and young people.

Individuals with low-income travel less, have low level of car ownership, walk more, and use public transportation more than those with higher incomes. Women face more barriers when accessing transportation, especially among groups with low income, leading to social exclusion. For many women, personal safety, due to fear of traveling alone, is a significant obstacle to using local transportation services.

The older population is considered one of the most vulnerable and largest groups without access to public services due to reliance on public transport. Older people with low incomes, who lack access to a car, face constraints and physical difficulties that limit their ability to access public transportation and travel longer distances.

Difficulties with accessibility, boarding, and moving by public transport, feeling unsafe, and walking long distances have become a huge barrier to transport accessibility, and thus transport poverty among individuals with disabilities.

Children and youth are greatly exposed to the risk of transport poverty, especially in low-income areas and family communities with low socio-economic status. Transport affordability gives young people a sense of community and independence. Access

to safe and affordable transportation is also essential in providing employment opportunities for young people [7].

3. MEASURING THE EFFECTS OF LIMITED ECONOMIC AND PHYSICAL ACCESSIBILITY TO THE TRANSPORTATION SYSTEM

The phenomenon of transport poverty can be measured within any population group or area. Some of the indicators considered are those identified in the literature as useful for measuring various dimensions of transport poverty. Indicators are specific and depend on the characteristics of the transportation system, land use, and area characteristics.

Measuring transport affordability refers to actual transport expenditure as a share of income, where it is proposed that households spending more than 10% of their income on transportation be defined as "transport poor". This approach neglects the concept of "suppressed transport demand" and the fact that, in developed countries, wealthier households spend more on transportation. When measuring the affordability of transportation services, it is important to consider other poverty indicators and consumption averages for similar households or areas, which entails combined housing and transportation costs.

Three variables commonly used to measure mobility are: *trip generation* - measuring the number of trips a person or household makes during a period of time; *travel distance* - besides measuring mobility, it can also be used as an implicit measure of accessibility; *travel duration* - which depends on network characteristics, the mode, etc.

Measuring accessibility include additional considerations about whether people can easily fulfil their basic daily activities within a reasonable time and at reasonable costs. It always considers the location of the "opportunities" that people want to access and the "separation" between people and those "opportunities".

Various studies emphasize the need for comprehensive and sophisticated research on mobility, which takes into account various aspects of individual needs across a broad spatial spectrum where they live and perform their daily routines. Authors highlight the importance of considering geographical factors, socio-demographic characteristics, daily activities, physical and cognitive abilities, as well as environmental conditions. However, collecting such complex data poses a challenge, especially in developing countries [2].

There is no single initiative that can reverse transport poverty. Strategies that include data analytics, equity in planning, mobility as a service, ticketing and congestion charging need to be defined. Focusing on transport equity (based on race, income, elderly, and youth) is an important goal to reduce the effects of transport poverty and it should be a measurable outcome, with strategies to address transport equity in their communities [8].

4. ECONOMIC ASPECT OF ACCESSIBILITY IN TRANSPORTATION SYSTEMS IN RURAL AND URBAN AREAS

Many poor individuals in rural areas are isolated due to factors such as distance, terrain, unemployment, economic conditions, market, healthcare, and education. The lack of basic infrastructure (roads, bridges) and limited access to transportation services make it difficult for poor individuals to access markets and services.

Recent research has shown that investments in transportation systems tend to benefit the "non-poor" the most and that investments must be consciously designed to avoid further impoverishing poor people. In cases where investments in the transportation system have stimulated economic growth, the poor often had minimal benefits because they have not had the resources to take advantage of the opportunities afforded by better access. Good transportation infrastructure is a necessary condition for economic growth and poverty reduction, but investments in the transportation system alone cannot solve the problems of the poorest households [9].

There is ample evidence that building roads (and/or paths and pedestrian bridges) to connect rural communities to the road network provides numerous benefits and reduces the number of people in extreme poverty [10].

Interventions in urban areas largely address the issues of urban congestion and the rapid increase in motorization rates, benefiting primarily the middle-class population. Poor community can also benefit from these changes, although it is often the reverse case, especially with the construction of new roads, separation, and relocation. Urban growth and suburbanization lead to longer commutes and increased motorized travel, causing congestion and more complex travel patterns. Public transportation becomes increasingly challenging to maintain, resulting in greater dependence on cars and increased difficulties for those without access to a car.

Despite significant road construction, congestion worsens, and average traffic speeds decline. Congestion affects all participants in traffic, and poor individuals often have to walk or use low-quality transportation alternatives. Solutions for congestion, including high-capacity urban roadways, can be extremely expensive. While the construction of rural roads can directly benefit poor community members, interventions in urban transport (new roads, metro systems, bus rapid transit) are often designed to reduce urban congestion and may disproportionately benefit wealthier segments of the population compared to the poor if not properly designed [9].

Consideration should be given to the sources of transport-related income (such as congestion charges, fuel taxes, etc.) that could be used to invest in ensuring equality in the provision of the transportation system for all user categories.

5. WORLD AND EUROPEAN PRACTICE EXPERIENCES

China's economic growth has led to much higher incomes for its population but has also resulted in inequality among the population, which poses a significant barrier to

economic, social, and environmentally sustainable development. A review of studies on transport poverty in Chinese cities has concluded that the most common causes of transport poverty include a lack of access to private cars, uneven access to transportation alternatives, inadequate public transport, and imbalances in urban structure. The main impacts of transport poverty include limited mobility and longer travel times, higher household travel expenses, reduced access to jobs and basic services, health, and environmental issues [11].

In Norway, in the region of Oslo, accessibility to private cars and public transport has been studied, as well as the difference in accessibility between these two modes of transportation. The difference was calculated as the public transport time competitiveness compared to a private car as a means of commuting to work. Public transport time competitiveness is an important factor in sustainable transport and the transition to low-emission mobility. However, absolute levels of accessibility are more important in interpreting social exclusion and transport poverty. It was concluded that wealthy areas have better public transport time competitiveness for commuting to work. It was noticed that families with children tend to reside in areas with low time competitiveness of public transport for job access.

When it comes to employment, low-income neighborhoods experience a lower level of public transport time competitiveness. This means that if the use of cars decreases due to increased costs, these neighborhoods will likely suffer from greater transportation poverty. This suggests that a shift towards low-emission mobility will require addressing various challenges and specificities [12].

Over the past decade, a significant increase in bus and rail ticket prices in Wales (United Kingdom) had the most significant impact on residents relying on public transport and those with low incomes. Although all households feel the effects of rising costs, households with low incomes are the most affected. Increasing transport costs already play a significant role in separating a larger portion of income to transportation needs [13]. Research shows that more than three million people in the north of England are at risk of social exclusion, prevented from participating in the opportunities and communities, as a result of poor transport services (mobility and connectivity). Citizens in the south of England can access up to seven times as many jobs by public transport [14].

6. CONCLUSION

The application of the Transport poverty concept would certainly improve the quality of existing practice in the urban mobility planning. It is crucial to gather the necessary data and establish a good quality database regarding the characteristics of the transportation system and the socio-economic characteristics of the population. It is important to investigate what level of transport service quality is available to different categories of residents. Existing travel pattern survey methods need to be supplemented with questions that provide insights into various aspects, including the percentage of income that an individual/household spends on transportation, ownership and use of private cars, the ratio of trips made by private cars versus public transportation, travel times, etc. Special attention should be given to the

problems like: capability to collect real data on individual/household incomes and travel expenses, and more precise travel times using different modes.

The analysis should also incorporate changes in fuel prices, public transport ticket prices, parking costs, and potentially market prices for purchasing private cars. It is implied that questionnaires include inquiries about household income, motorization levels, possession of driver's licenses, as well as the proximity of the nearest public transportation line, the existence of public transport lines to locations of daily activities for individuals, any difficulties individuals may encounter in mobility and performing daily activities, and similar factors. Through the proposed detailed analysis, it is possible to assess the quality of service for different spatial areas and different categories of residents, and subsequently propose specific measures that could potentially contribute to reducing transport poverty.

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