

## **Equity in urban transportation planning: the 15-minute city approach. A case study of Oslo city, Norway.**

The World Bank estimates that 2 billion more people will live in urban areas by 2045, creating enormous challenges as cities expand worldwide. Given these circumstances, transportation planning will be one of the primary considerations for policymakers and city officials. This concern includes, among others, planning and forecasting for increased transportation demand in light of growing CO2 emissions and land use constraints. Transport planning is a decision-making process grappling with prioritizations, and its outcomes will inevitably favor certain investments over others, some modes of transportation over others, specific regions over others, and consequently, some individuals over others. Hence, transport planning is inescapably a normative activity that raises equity concerns.

Integrating equity in transportation plans and programs would be a long-term endeavor for decision-makers. There have been efforts to adopt transport policies based on equity in the US and UK. Also, the EU Cohesion Strategy ensures that initiatives aim to eliminate inequalities in the sustainable transportation system and address gaps in regional accessibility and connectivity. However, the definitions of many terms and concepts are imprecise, and academic debate about transport-related equity is still ongoing. A noteworthy study on integrating equity into transportation is Litman's (2009) research, which addresses equity issues in transportation planning by looking at practical applications and theoretical frameworks. Also, Lucas et al. (2019) and Karel Martens (2016) have done valuable studies in this field that offer beneficial insights into the historical trajectory of incorporating equity into transport research. Transport equity is commonly measured using accessibility, and scholars often consider this component to transpose the concept of transport-related equity into measurable policies, metrics, and strategies.

In a sustainable city, individuals would ideally have access to all basic activities within a short walk or transit ride to fulfill their everyday needs. This view aligns with the chrono-urbanism concepts discussed in the recent 15-minute city viewpoints. Hence, the 15-minute city has emerged as a planning model or vision for a more inclusive city, providing a clear equity perspective on transport planning by focusing on the community level.

According to the 15-minute city concept, to live in a high-quality environment, citizens must have access to six essential urban social functions, which are: living, working, commerce, healthcare, education, and entertainment. This research investigates the accessibility to educational, health, and green space facilities using active mobility (pedestrian and bicycle modes of transportation) within Oslo, Norway. A significant percentage of Norway's population is highly satisfied with their lives. Additionally, as per the Ministry of Local Government and Modernization in 2019, Oslo accepted the planning principle of chrono-urbanism (the nearby city). Accordingly, this research selected Oslo as a highly qualified city for living to ascertain whether transport-related inequality exists. The study employs a quantitative analysis method, utilizing ArcMap software and specifically "network analysis" and "spatial analyst tools" to assess accessibility. In this analysis, the 15-minute concept is considered an access evaluation factor, meaning a service should be reachable within an 800-meter radius or a 15-minute round-trip. This research analyzes age, income level, and ethnicity to examine the demographic and socioeconomic characteristics of the residents who do not have proper access to selected

services. Results show that the peripheral areas of Oslo city have poorer access to urban services using active mobility compared to the central neighborhoods. In addition, there is a higher concentration of non-Norwegian immigrants in these places, which includes the settlements of lower-income groups. The findings of this study are novel. It contributes to a further understanding of the 15-minute city approach as a methodological tool to investigate equity in transport planning. The empirical findings are also significant since they can be valuable to planners and urban officials to promote equity in urban transportation while proposing policies that would enhance citizens' quality of life.

**Key words:** Transport-related equity, accessibility, 15-minute city.

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