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Scale Matters: Proximity and Cycling Share in 40 European Metropolitan Areas

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This work addresses the following topic(s) from the Call for Contributions:
(Please check at least one box)

☐ Placemaking to integrate urban spaces and mobility
☒ Promoting sustainable mobility choices in metropolitan regions
☐ Governing responsible mobility innovations
☐ Shaping the transition towards mobility justice
☐ System analysis, design, and evaluation
☐ other: _____

Extended Abstract

Problem statement

Trips within the metropolitan regions remain a crucial challenge accounting for a substantial portion of travelled kilometres and greenhouse gas emissions related to motor vehicles. To address the pressing social and environmental challenges of our time, advocating for the adoption of bicycles as a mode of transport offers a promising avenue for fostering healthy, sustainable, and cost-effective mobility that emphasizes proximity and fosters engagement with urban structures. Bicycles, particularly well-suited for short and medium distances, have seen a remarkable surge in usage across many European cities in recent decades, contributing to the rise of cycling as a mode of transportation. Despite these positive trends, motor vehicles still dominate metropolitan areas, and the rise in bicycle usage does not consistently lead to a proportional decrease in car usage.

In this context, cities like Utrecht and Copenhagen, among others, have been hailed as cycling model cities, having also reduced the percentage of its car modal share. These cities also serve as examples of 15-minutes cities, where basic needs can be easily accessible through active modes. Consequently, many cities have attempted to implement various cycling-friendly measures at the expense of cars, following the lead of these cities. While these measures have proven effective in cities with similar urban characteristics and scale, larger metropolitan areas with higher population, increased trip volume and distinct mobility cultures, often require more nuanced models and policies. In these cases, the time needed to access basic necessities frequently extends to 30 minutes and, for commuting, even reaches 40 minutes, underscoring the need for different and pragmatic approaches.

Research objectives

This study aims to examine the prevailing focus of research and cycling policies on small to medium-sized cities and the city center of larger metropolitan areas, often overlooking the comprehensive perspective of the city as a whole. It recognizes the profound impact of scale on urban mobility. For instance, small metropolitan areas inherently embody the concept of 15-minute cities, and the bicycles can serve as a self-sufficient means of

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transportation. In contrast, in larger metropolitan areas, bicycles often play a role in multimodal trips, serving as first and last-mile connections to public transport due to greater distances involved. The primary goal is to extract and tailor measures suitable for various metropolitan regions based on their unique scales, with the aim of promoting cycling as a mode of transportation. These objectives will be framed within the recognition that scale plays a pivotal role in the understanding of proximity and cycling modal share.

Methodological approach

Regarding the study's methodology, 40 European cities of varying urban scales and levels of cycling and car use were selected as case studies. The selection was also based on the availability of data related to modal share, number of trips, size, population, and average travel times within their metropolitan regions. The 40 cities were categorized into four groups based on these characteristics:
-13 small-scale cities: Freiburg, Vitoria-Gasteiz, Utrecht, Münster, Dresden, Gothenburg, Bratislava, Grenoble, Vilnius, Tallinn, Luxembourg, Strasbourg, Bordeaux.
-20 medium-scale cities: Prague, Helsinki, Zagreb, Vienna, Amsterdam, Zurich, Hamburg, Stockholm, Copenhagen, Warsaw, Munich, Oslo, Sofia, Krakow, Lyon, Valencia, Brussels, Dublin, Seville and Lisbon.
-5 large-scale cities: Berlin, Barcelona, Madrid, Rome and Milan.
-2 extra-large-scale cities: London and Paris.

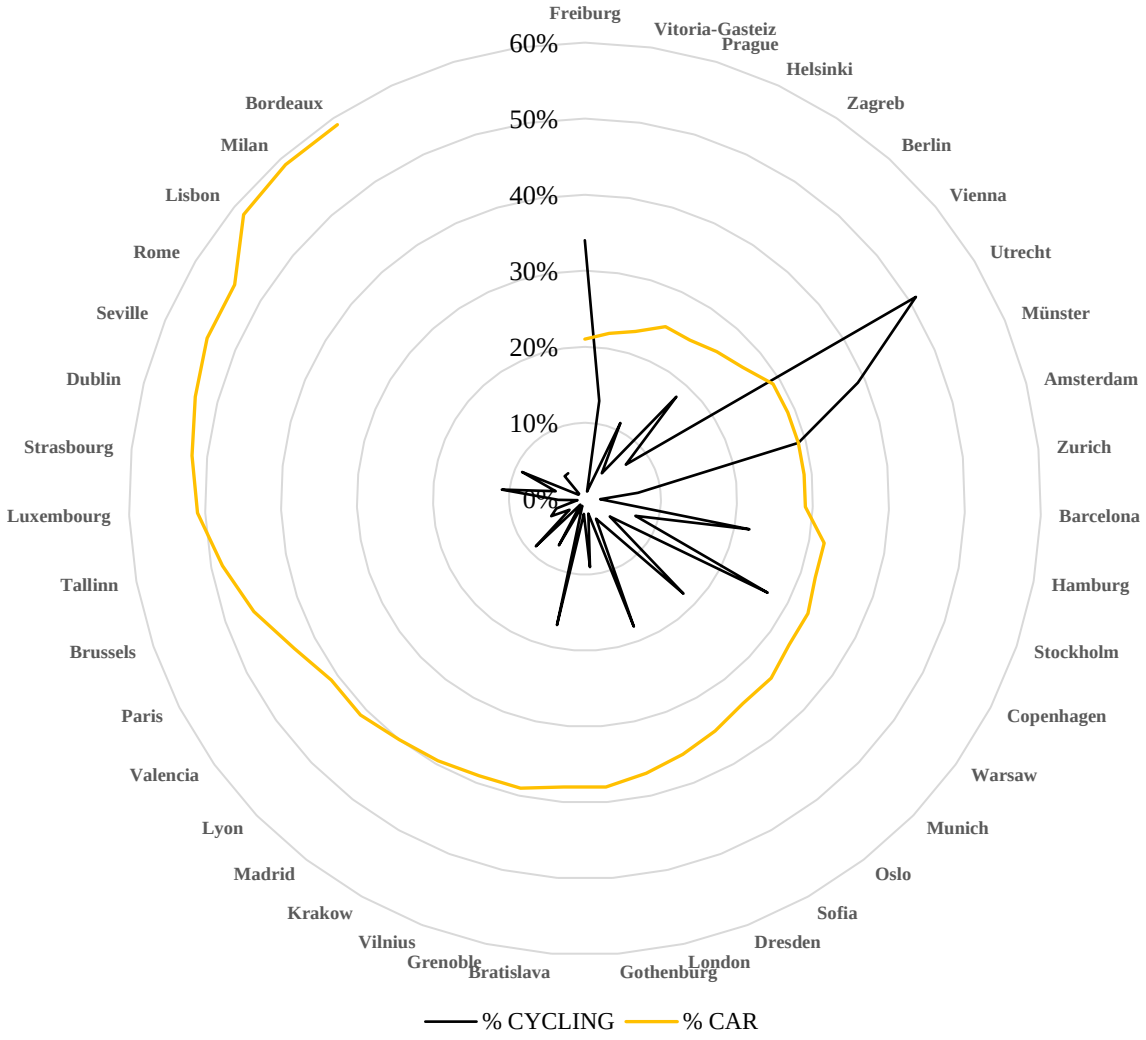

Figure 1: Modal share in 40 European cities

Sources: European Mobility Venture 2021 Report (MCube, TUM), Household Mobility Survey 2018 (Consorcio Regional de Transportes de Madrid), and various other studies. Own elaboration.

The study grouped and collected modal share data, focusing on a comparison between car and bicycle modal share percentages. Cities were arranged from the lowest to the highest car modal share (**Figure 1**). This approach revealed cities where bicycle use has surpassed car usage, notably in Freiburg and Münster (Germany), and in Utrecht and Amsterdam (Netherlands). On the other hand, in cities like Paris, with a 43% of car modal share in its whole metropolitan area, cars account for 20% of trips within the city but rise to nearly 50% in the suburbs and up to 80% in rural areas, reflecting an existing territorial issue. This pattern is also observable in other major cities such as London, Madrid or Milan, leading to car dependence for the working population living outside the city center. The separation between home and workplace, characterized as a "a new, strong, and silent phenomenon" (Breto, 2022), becomes notably pronounced in these larger metropolitan regions.

To comprehend the various models and measures aimed at promoting bicycle use and restricting car usage based on city scale and its metropolitan area, the next phase of the analysis will rely on a systematic review of existing literature concerning policies implemented in different cities across the four previously mentioned categories. Subsequently, to qualify and validate the findings, interviews will be conducted with various researchers, policy-makers, and cycling mobility experts from at least one city in each category (access has already been secured). Their insights will be correlated with the policy measures identified in the literature. These findings will be synthesized, discussed and, where applicable, adapted to suit the specific context of cities with similar scales, geography and urban characteristics.

(Expected) results

This paper aims to demonstrate the significance of scale in modal distribution and encourages the exploration of new models and an effective, transferable roadmap tailored to each city scale and local context to promote cycling and reduce car usage. It also underscores the necessity for a series of actions that address transportation challenges in connecting peri-urban areas. The intention is to identify diverse policy strategies, governance pathways, and business models for the four categories included in the study, which can be adapted to the specific spatial context of each city and its metropolitan area.

References

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