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The Roadmap for Shaping the ±15-Minute City: Proximity-centered Accessibility in Practice

Environmental benefits of logistics facilities in the 15-Minute City – A trade-off analysis of transportation and real estate impacts

Claire SCHELFHOUT, Prof. dr. Heleen BULDEO RAI

claire.schelfhout@vub.be

Vrije Universiteit Brussel

Mobilise research group

In light of today’s climate change challenges, reducing the carbon footprint of the transportation sector is essential. The sector is responsible for almost a quarter of Europe’s CO₂ emissions, with little expectation of decline in the years ahead (Pietrzak & Pietrzak, 2020). More than half of the global population live in cities. The way urban inhabitants live and move around has a significant impact, given that cities are responsible for two-thirds of energy consumption and to 60 to 80% of greenhouse gas emissions worldwide. Although the logistics industry plays a critical role in delivering goods and services to urban areas, it too faces significant challenges in reducing its emissions. Back in 2011, the European Commission set a target for major European cities to achieve zero-emission goods transportation by 2030. The goal was to achieve net zero by 2050 and phase out combustion engines as part of the Green Deal. At the moment, vehicles intended for goods transportation account for about 10% of vehicle movements in cities, but contribute disproportionately to 25% of total CO₂ emission (Holtslag et al., 2020).

In response to decarbonization and zero-emission goals, emerging urban planning models offer sustainable solutions. Especially the ‘15-Minute City’ concept has gained significant traction among urban planners around the world. This concept redefines urban planning with a focus on human scale, aiming to make essential amenities accessible within 15 minutes of walking or biking. Based on three essential pillars – i.e., density, design, and diversity – it shifts urban planning away from the traditional focus on motorized traffic flows, leading to congestion and other negative externalities. In transforming direct travel needs, the concept intends to eliminate urban emissions through proximity.

The ambitious objective of ‘15-Minute Cities’ to provide essential amenities within walking or biking distance, combined with other key characteristics (e.g., high population density, mixed land use), will likely lead to increases in the urban demand for goods. Strategically positioning logistics facilities closer to consumers becomes crucial for organizing deliveries more efficiently and sustainably. Called “proximity logistics” (Buldeo Rai et al., 2022) such facilities

are being built in cities like Paris, New York, Tokyo, Shanghai and Seoul, to reduce transportation distances and facilitate the use of cargo bikes and electric vans. Although in many cases these facilities occupy only a few square meters in a neighborhood parking lot, a concurrent trend toward large-scale new development projects to support urban logistics is noticeable. This raises the question of whether the transportation externalities that urban logistics facilities can avoid are not outweighed by the increased energy requirements to power, light and heat these buildings. When it comes to urban logistics, hardly any research exists on the relationship between real estate and transportation. Nonetheless, this link could give invaluable insights on how to shape the new proximity logistics and how to integrate it in concepts like the 15-minute city. Therefore, the research question of this study is: *'to what extent does the environmental benefit of reduced transportation impacts brought about by urban logistics facilities, outweigh the additional real estate impacts of these facilities?'*

This research presents the factors influencing the environmental benefits of urban logistics facilities, focusing on the contribution of real estate and transportation activities. Through multiple case studies and an operational carbon footprint analyses, we assess and compare the energy consumption of urban logistic facilities with the transportation activities associated with goods demand to and from these facilities. This paper presents preliminary results of logistics operations through urban logistic facilities in combination with zero-emission deliveries, compared to Business-As-Usual (BAU) operations without urban logistic facilities.

Keywords:

Real estate; urban logistics; \pm 15-Minute City

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