

mobil.TUM 2024 – The Future of Mobility and Urban Space, April 10-12, 2024

## Unlocking Cargo Bikes' Potential for Sustainable Mobility and Logistics in the Brussels Capital Region

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Keywords: *e-Cargo Bikes, cargo bike adoption, cargo bike profiles, active mobility*

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

Amid our current climate crisis, cycling has been gaining more and more attention as one of the major solutions to the urban challenges created by road transport proliferation and pollutant emissions. While significant achievements have been made regarding cycling infrastructure, promotion, and investment, barriers remain to achieving the desired sustainable mobility shift. In this regard, e-cargo bikes appear as an innovative solution to overcome some of the regular bike's physical barriers, such as its lack of load capacity compared to vans or cars (Carracedo and Mostofi, 2022).

Research on the e-cargo bike's potential to reduce the negative impacts of transport has been increasing in the past years, especially for last-mile deliveries and service trips, since it offers an interesting alternative for light commercial vehicles. Moreover, the use of cargo bikes as a transport mode has gained significant attention with the proliferation of restrictive strategies for car and van regulations in city centres towards zero emissions zones. With the electrification of this vehicle, cargo bikes are considered a more efficient and cost-effective option. Nevertheless, despite the increasing interest in researching cargo bikes' potential for mobility and logistics, the deployment of studies has been characterized by focusing on delivery trips and the larger companies' adoption process (Narayanan and Antoniou, 2022), which have easier access to larger data sets and private funding. In that regard, there are fewer insights on the different cargo bike users' profiles beyond cycle logistics and their adoption process, including a research gap on private mobility and shared cargo bike scheme users.

With the deployment of regional measures towards developing a holistic cargo bike culture for individuals and professionals, like the 2020-2023 EU-funded CAIRGO BIKE project in the Brussels Capital Region (BCR), there was an opportunity to dive into the different cargo bike users' profiles and their adoption process. Involving public-private and academic partnerships, it aimed to give an alternative to common car usage, such as kids' transport, shopping, and last-mile logistics, by convincing and helping individuals and professionals to use a cargo bike to transport goods and passengers. The project developed an integrated and user-oriented ecosystem strategy by

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tackling the significant deterrents identified. First, provide free electric cargo bike testing for individuals and professionals. Second, facilitating cargo bike access via premiums for SMEs and the development of renting and sharing cargo bike schemes around the region, and third, creating safe cargo bike parking.

### **Research objectives**

This paper will expose the different cargo bike profiles found amid the CAIRGO BIKE project deployment of promoting strategies. By complementing the recent literature on cargo bike users from the logistics sector and diving into the user's characteristics from the personal mobility side, this research aims to understand comprehensively the differences and commonalities between cargo bike users. In this paper, we contribute to the literature on sustainable transport behavioural change by exploring the adoption process of cargo bikes. More precisely, we seek to deepen the knowledge of the behavioural insights and characteristics of early cargo bike adopters based on empirical insights. Improving the understanding of cargo bike users' adoption aims to help policymakers develop more tailored and effective public policies towards a sustainable mobility shift.

### **Methodological approach**

We used a mixed methodology approach based on surveys and interviews carried out for monitoring and evaluating the different project partners' pilot projects and strategies deployed during the CAIRGO BIKE project. Based on the information collected throughout the empirical research among the free testing trials for individuals, their daily mobility diaries and the survey responses from the cargo bike premiums accreditors, we classified the cargo bike users into twelve groups: four profiles related to commercial usages, four profiles related to personal mobility purposes and two mixed profiles. We inquired about their adoption process, motivators and barriers to using a cargo bike, their desired and actual use and the influence of the different strategies. We tested these findings in two public events by showing a poster with a graphical representation and a persona description of each profile, asking the attendants to discuss and complement the information found.

### **Results**

On a general scope, trialability and incentives to facilitate cargo bike's cultural development, such as training, free testing and subsidies, proved effective in increasing the acceptance and enhancing a cargo bike adoption process. Commonalities among the profiles are a previous bike culture and knowledge, strong environmental concerns, and curiosity about the cargo bikes' advantages, such as load capacity, cost reduction and flexibility. In terms of barriers and constraints, the cargo bike's price, fear of theft and lack of safe parking places were the most mentioned ones.

According to our findings from the commercial profiles, there is major potential for entrepreneurs from a diverse of sectors like audiovisual and food services, which can shift faster towards more sustainable ways of providing services and delivering their products. Other profiles related to commercial mobility were express retailers, mobile services like plumbing, and cycle-logistics cargo bike couriers. From the mobility profiles, 90% of them were motivated by children's transport. The most represented profiles during the trials were families with one or two cars who would like to change one of them for a more sustainable transport mode. They were followed by regular bike users' parents who want to keep cycling despite having children. Then, single parents were interested in the autonomy which the cargo bike could bring and, finally, a small representation of non-family related users who were keener on using sharing cargo bike schemes.

Other insights from the cargo bike user's analysis are the gender differences regarding the primary purpose of usage. Commercial cargo bike usage was male-dominated, while participants interested in cargo bikes for personal mobility were mainly women. Future research should focus on the mixed profiles found during the analysis where cargo bike parents were interested on using the vehicle for their own businesses, and cycle couriers could see the advantages for personal mobility especially related to children.

### **References**

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