

# Cargo bikes - A risen star in last mile pickup and delivery

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# Structure

- Introduction
  - Research aim and methodology
  - Overview – last mile delivery practices by cargo bikes
  - What already had been said in literature
- Last mile delivery practices with cargo bike
  - Cases –Cargo Velo ghent, DHL antwerp, Cargo bike use - KoMoDo
- Challenges and Opportunities for growth
- Future research path

# Introduction

- Research question:
  - What are the challenges and opportunities of cargo bike use in last mile deliveries?
- Methodology:
  - Exploring existing last mile delivery practices with cargo bikes in Europe
  - Knowing how they work
  - Observing challenges and exploring the opportunities for growth

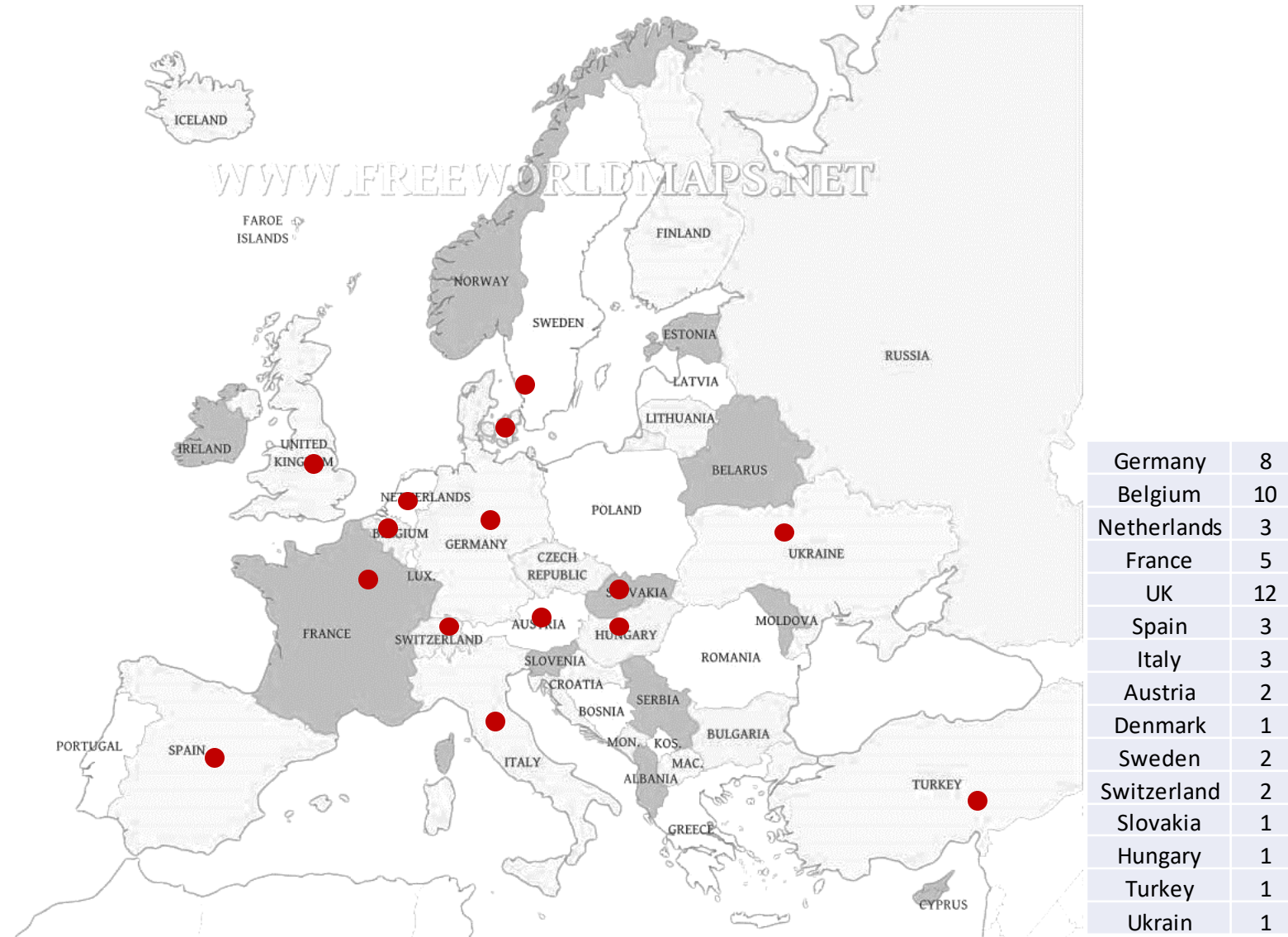
# Types of cargo bikes



Bike, <https://>



# Last mile delivery practices with cargo bikes in Europe



# Literature on use of cargo bike in urban freight

- **Cargo cycles for local delivery in New York City: Performance and impacts** - Alison Conway, Jialei Cheng, Camille Kamga, Dan Wan, 2017
- **Travel time differences between cargo bikes and cars in commercial transport operations** - Johannes Gruber and Santhanakrishnan Narayanan 2019
- **CycleLogistics – moving Europe forward!** – Susanne Wrighton and Karl Reiter 2015
- **Cargo cycles in commercial transport: potentials, constraints and recommendations** - Christian Rudolph and Johannes Gruber 2017
- **Design and operation of an urban electric courier cargo bike system** - Tanja Niels, Moritz Hof and Klaus Bogenberger 2018
- **Sustainable city logistics – making cargo cycle viable for urban freight transport** – Gabriele Schliwa, Richard Armitage, Sara Aziz, James Evans and Jasmine Rhoades 2015
- **The use of bicycle messengers in the logistics chain, concepts further revised** – Jochen Maes and Thierry Vanellander 2012
- **The role of urban consolidation centres in sustainable freight transport** - Julian Allen, Michale Browne, Allan Woodburn and Jacques Leonardi 2012

# Advantages of cargo bikes considering urban logistics sector



- '0' emission and noise
- Easy to park
- Health benefits for rider
- Uses less road space
- Gives 'green label' to logistic companies
- Need less maintenance than conventional vehicles
- Can deliver in the pedestrian zones
- Not restricted to delivery time windows

# Examples of results from scientific literature

- The bikes have an advantage in terms of speed during times of greater congestion such as morning rush hour periods (Conway et al. 2017)
- Results from Porto indicate that the implementation of cargo cycles can lead to better traffic performance (with lesser time delay being one indicator) upto replacement rate of 10% of conventional vehicles (Melo and Baptista. 2017)
- In a densely populated area, the vehicle mileage covered by diesel trucks per day can be approx. reduced from 180km to 45km (Tanja Niels, Moritz Hof and Klaus Bogenberger 2018)
- Bike messengers can be a viable solution for urban logistics. Bike courier will need bigger volumes to have stability in the long run. It will need policy interventions and additional infrastructure like city hub for better operations. (Adapted from Maes and Vanellander 2012)
- Concerning spatial context, Greater trip distance was a factor favoring trucks over cargo bikes without electric assist (Conway et al. 2017)



# Last mile delivery practices with cargo bikes in Europe



Germany	8
Belgium	10
Netherlands	3
Hungary	1
Turkey	1
Ukraine	1

1. Exclusive bicycle courier
2. Combination of vans and bicycle
3. Support of additional infrastructure like micro hub in densely populated areas



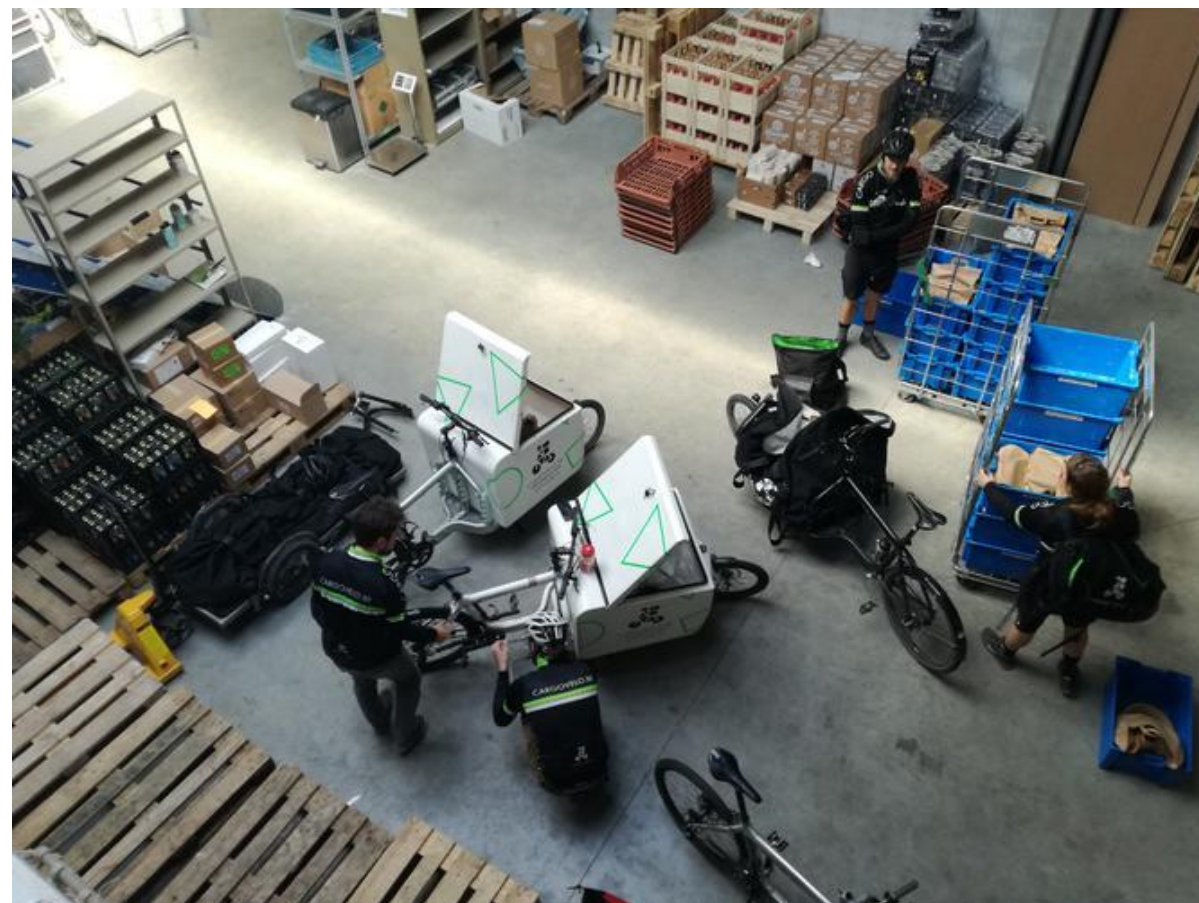
Hungary	1
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# Cargo Velo, Ghent and Antwerp - Belgium



Photo by An Van Gijsegem

# Cargo Velo, Ghent and Antwerp - Belgium



# DHL, Antwerp, Belgium (also operated by DHL Netherlands, Germany and Sweden)



# Cargo bike use at KoMoDo micro hub, Berlin - Germany



# Urban logistics practices with cargo bikes

Cargo Velo



KoMoDo



DHL



City	Ghent	Berlin	Antwerp
<b>Fleet</b>	15 cargo bikes and an additional trailer	11 cargo bikes	conventional vans and 10 cargo bikes (armadillo with container)
<b>Parcels/day</b>	Approx. 250 parcels	160,000 in one year (gradual increase by end of the project)	Approx. 1200 parcels (combined)
<b>Reason to operate cargo bikes</b>	To develop a sustainable bike delivery practice	to learn about sustainable solutions through pilot project of micro hub	To practice sustainable solutions for last mile delivery
<b>single/multiple operator</b>	single	multiple	single
<b>Support infrastructure</b>	Consolidation/distribution at the edge of the city centre (Gentbrugge)	Micro hub for operating in a neighbourhood (Prenzlauer Berg)	Consolidation/distribution centre at the edge of the city centre (Noorderlaan)
<b>Services offered</b>	parcel, express, courier	parcel, express, courier	parcel, express, courier



## Bicycle courier – the qualitative side

“We feel great when people take selfies with us or take our pictures for that matter!”

“Bad weather!! Oh no, it’s just a matter of different cloths we choose to wear!”

“Even if we have choice, we prefer taking bikes over vans to deliver parcels. It’s fun to be in the open environment, it’s faster and it is kinda cool!”

# Challenges and opportunities in last mile delivery by Cargo bikes

Challenges	Opportunities
<ul style="list-style-type: none"><li>• Market is small compare to regular delivery practices, Labour costs are higher compare to regular logistics practices, e.g. volumes per driver per route</li><li>• Keeping balance between interim and permanent employees</li><li>• Managing volumes, planning routes and split up goods</li><li>• Support of infrastructure (micro hubs, bike lane network etc.)and its feasibility</li><li>• Financial difficulties</li></ul>	<ul style="list-style-type: none"><li>• Promising market for e-commerce+ CEP</li><li>• Collaboration with global market players</li><li>• A constellation of various political agenda can create favourable environment for cargo bicycles</li><li>• Policy interventions can encourage competitiveness</li></ul>





## Message from literature in a nut-shell

Cargo bike use in a **certain condition** can be the best solution to combat congestion and smooth flow of goods in the urban areas



## Future research path

- What is the scale of their private economic viability (benefits and profits)?
- At what level Infrastructure (bike paths network, city hub) helps to enhance the use of cargo bikes?

*“Traffic congestion is caused by vehicles, not by people in themselves.”  
– Jane Jacobs, author of The death and life of great American cities*

Thank you for providing your listening!

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