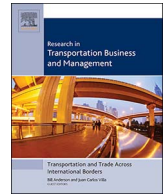




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Cargo cycles in commercial transport: Potentials, constraints, and recommendations

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ABSTRACT

Cargo cycles can play a significant role in supplying urban centers, helping to decrease harmful commercial transport externalities. Some companies have already carried out initial pilot schemes using cargo cycles in order to assess technologically and economically feasible use cases. However, a structural overview of the relevant market segments for commercial cargo cycle use and suitable recommendations is lacking. This paper provides results from an extensive empirical survey, based on desk research and 45 expert interviews with corporate fleet managers, urban planners, and representatives from municipalities and bicycle associations. Hidden potentials can be found not only in logistics industries, but also in businesses offering home deliveries and other services. Insight into drivers, constraints and companies' requirements allows recommendations to be derived for municipalities to stimulate cargo cycles' market penetration. These recommendations address regulative frameworks, strategic urban planning, infrastructure adjustments, testing programs, collaborations with the private sector, platforms for knowledge transfer, and the use of cargo cycles by public authorities.

1. Introduction

Cities are facing the challenge of ever-growing urban freight transport demand and its harmful associated transport externalities, such as congestion, traffic conflicts and pollutants. One possible contributor towards more efficient and environmentally friendly commercial transport is the use of bicycles, especially cargo cycles. After motorized vehicles substantially replaced bicycles during the last century, the commercial use of cargo cycles (usually electrically assisted) can be observed in European cities recently (Menge & Horn, 2014). But can we already talk of a cargo cycle renaissance? Hardly. The total number of cargo cycles in the commercial context is still marginal in comparison to their potential as predicted by several studies (Cyclelogistics, 2014; Gruber, Kihm, & Lenz, 2014; Wrighton & Reiter, 2016).

Nevertheless, structured research on the use of cargo cycles within city logistics is scarce (De Decker, 2012; Lenz & Riehle, 2013) and the number of companies using cargo cycles instead of conventional motorized vehicles is still low. In recent years, several companies of the courier, express and parcel (CEP) sector have introduced cargo cycles for last-mile deliveries, often combined with urban micro-consolidation centers (UCCs). Conway, Fatisson, Eickemeyer, Cheng, and Peters (2012) state that in order to exploit the maximum potential of cargo cycles, introducing UCCs is a prerequisite. In the inner city of Hamburg,

for example, UPS decided, after piloting a UCC successfully in an inner city location, to increase the number to four. A swap body serves as the UCC in this case. For each center, UPS uses two different types of cargo cycles (the “Long John” type [two wheels] and tricycle [three wheels]) and a pushcart for very nearby locations (BWVI, 2015). In Brussels, TNT operated a trailer-based mobile UCC with cargo trikes for the same purpose (Verlinde, Macharis, Milan, & Kin, 2014). In Paris, logistics companies like La Petite Reine use underground parking facilities as micro distribution hubs (Janjevic, Kaminsky, & Ballé Ndiaye, 2013; Koning & Conway, 2015). Leonardi, Browne, and Allen (2012) calculate a drop in CO₂ emissions of 55% using UCCs with cargo cycles and electric vehicles, and a potential 14% fall in vehicle miles travelled according to this study. In Amsterdam, DHL is piloting an electrically propelled barge as a UCC that moves along the canals inside the city. The barge can be flexibly towed where needed, offering a low-cost and safe concept since no space is needed on land and bikes can be parked on the barge at night (Hyard, 2014). Gnewt, Outspoken! and Last Mile Leeds are some of several UK-based courier companies using cargo cycles successfully for the last couple of years (Schliwa, Armitage, Aziz, Evans, & Rhoades, 2015). Other examples of successful commercial uses of bicycles are food deliveries, e.g. pizza chains delivering food with two-wheeled pedelecs (electric bicycles) equipped with an insulated box. Deutsche See uses cargo cycles to deliver fresh fish to restaurants

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Table 1
Overview of investigated best practices.

Name of best practice	Publicly-funded project?	Type of users (Companies (M) municipalities (O)ther	Market segment	URL
334. Deutscher Evangelischer Kirchentag Hamburg 2013 e.V. BASf	x	O: Pilot C	Internal/on-site transport Internal/on-site transport	http://www.hamburg.de/kirchentag-hamburg/ www.radmarkt.de/nachrichten/basf-zweirad-flotte-1500-mofas-raus-pedececs-rein
Bayer Leverkusen		C	Internal/on-site transport	www.leverkusen.com/guide/index.php?view=00026
BentoBox (CityLog)	x	C	Courier services	www.bentobox-berlin.de ; www.city-log.eu/lyon/bentobox
Biobob		C	Home delivery services	www.bio-hamburg.de/scripts/basics/bio-hamburg/news/basics.prg?session=42f942c7496ce1b4_90749&a.no=222&r_index=7.1
Bundeswehr	x	O: Military	Internal/on-site transport	www.ich-ersetze-ein-auto.de/zwei-ibullitts-bei-der-bundeswehr
Call-a-pizza		C	Home delivery service	https://www.call-a-pizza.de/
Cargo Cycle Logistics		C	Courier service	www.cargocycle.de/logistics/
City farming		C	Home delivery service	http://www.city-farming.de/
Deliveroo		C	Home delivery services	www.gruenderszene.de/datenbank/unternehmen/deliveroo
Deutsche Post		C	Postal services	www.pin-ag.de
Deutsche See		C	Home delivery services	www.deutsche-see.de/verantwortung/handeln/unser-fisch-fachrt-fahrrad/
DHL Amsterdam		C	Parcel services	www.dhl.com/en/press/releases/releases_2015/express/dhl_introduces_cubicycle_an_innovative_cargo_bike.html
DPD Hamburg		C	Parcel services	www.dpd.com/de/home/verantwortung/umwelt/klimaneutraler_versand/insetting/zustellung_mit_fahrraedern
EBU Ulm		M	Service trips	www.swp.de/ulm/lokales/ulm_neu_ulm/Koepe-Klatsch-Kurioses;art4329.3.122.617
Evonik Chemiepark Marl		C	Internal/on-site transport	www.effizient-mobil.de/uploads/tx_abdownloads/files/Feldmann_-_Fahrradfoerderung_im_Chemiepark_Marl.pdf
Foodlogica		C	Home delivery services	http://www.foodlogica.com/
Foodora		C	Home delivery services	www.rckt.pr.co/104686-pinke-fahrrader-in-berlin-startup-setzt-zeichen-fur-eine-fahrradfreundliche-stadt
Förderprogramm Lastenräder Gartenamt Münster	x	O: Test M	All segments Service trips	http://www.agfk-bayern.de/3-bayerische-fachtagung-radverkehr-in-regensburg www.wn.de/Muenster/2013/12/1387787-Gruenpfleger-Rudolf-Kampensis-sattelt-um-Mit-dem-Elektro-rad-zur-Gruenpflege
Gnewt Cargo		C	Courier services	www.gnewtcargo.co.uk
Handwerksbetrieb Elektro		C	Service trips	http://www.der-radende-installateur.de/
Ich ersetze ein Auto	x	O: Test C	Courier services	http://www.ich-ersetze-ein-auto.de/
IKEA Altona		C	Home delivery services	www.ikea.com/de/de/store/hamburg_altona/services
Joey's Pizza		C	Home delivery services	www.energieeffizienz-erleben.de/stories/die-lei-setreter/
Kiezkaufhaus	x	C	Home delivery services	www.kiezkaufhaus.de
Lasten auf die Räder messengerTransport + Logistik GmbH "Mir sätia umi"	x	O: Promotion project C	All segments Courier service	lastenrad.vcd.org/ http://www.messenger.de/
Ordr.cz	x	O: Test	All segments	http://www.bern.ch/politik-und-verwaltung/stadtverwaltung/sue/amt-fur-umweltschutz/umwelt-und-energie/fachstelle-mobilitaetsberatung/projekte-und-berichte
Outspoken!		C	Home delivery services	www.czechcrunch.cz/2014/10/ordr-cz-zachna-rozvazet-i-na-smichove/
Pedalpiraten		C	Courier services	www.outspokendelivery.co.uk
Pflegedienste machen mobil	x	C	Courier services Service trips	www.pedalpiraten.de www.bund-bremen.net/index.php?id=15372

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