



INSTITUT FÜR
LOGISTIK UND MATERIALFLUSSTECHNIK

Transporting pallets by cargobikes

M.Sc. Tom Assmann
Department for Logistical Systems
tom.assmann@ovgu.de

21st June 2016 – Cities for Mobility, Stuttgart, Germany

Introduction

Transformation of the cities

Change of goods and consumer behaviour

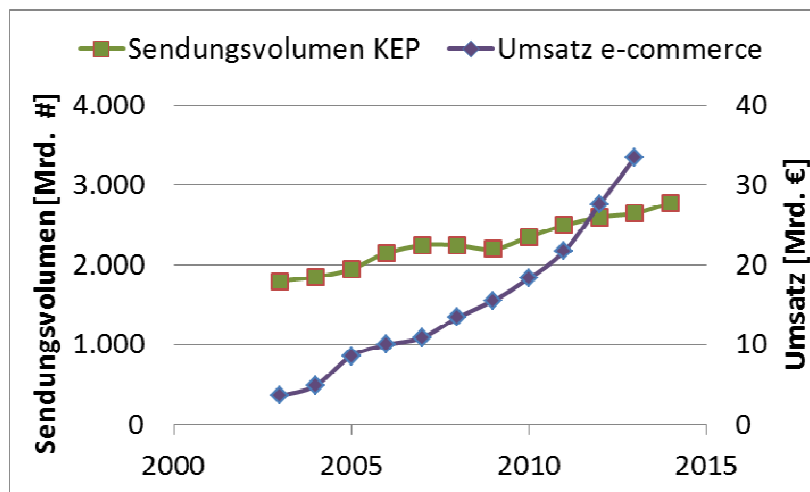


Urbanization & Mediterraneanization

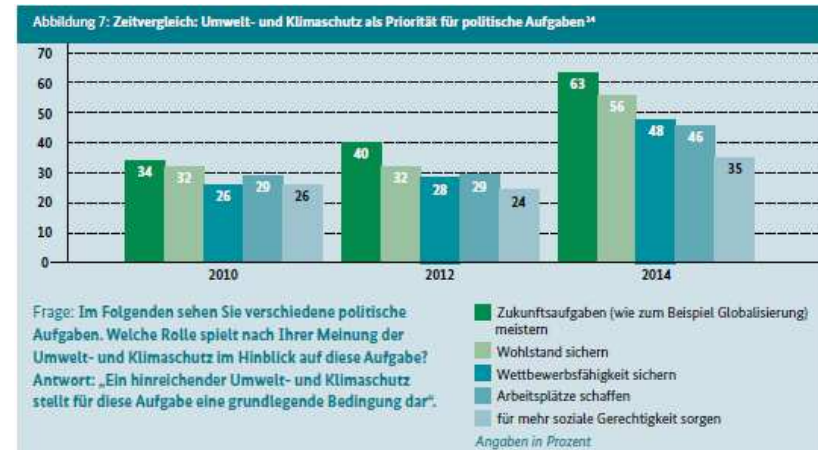
(Stadt nach Acht)

Increasing-commerce and parcel-
transports

Increasing ecological consciousness



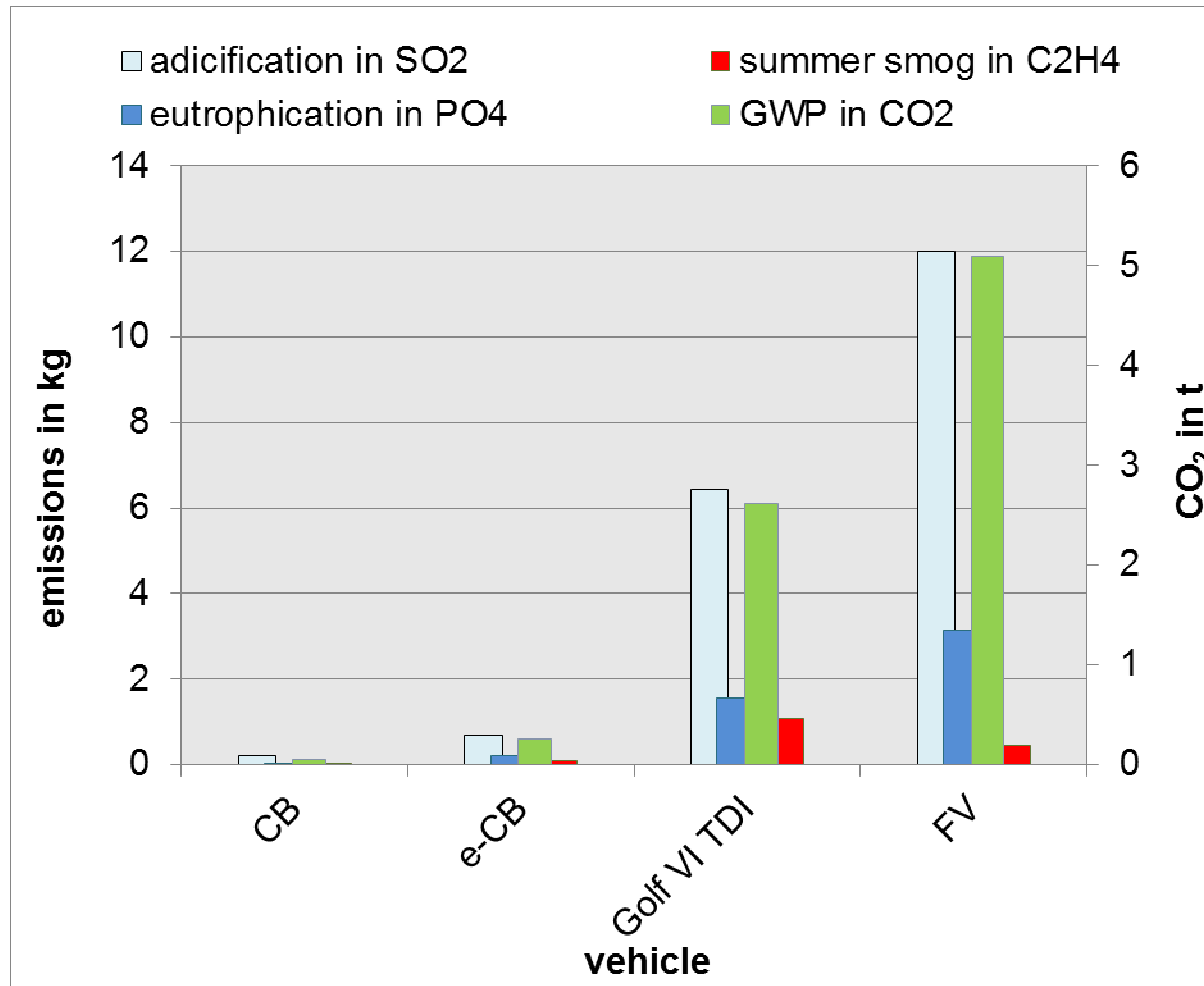
Own diagramm according to nach Lenz 2014; KEP-Studie 2015



(UBA 2014)

The ecological potential

Emissions per year

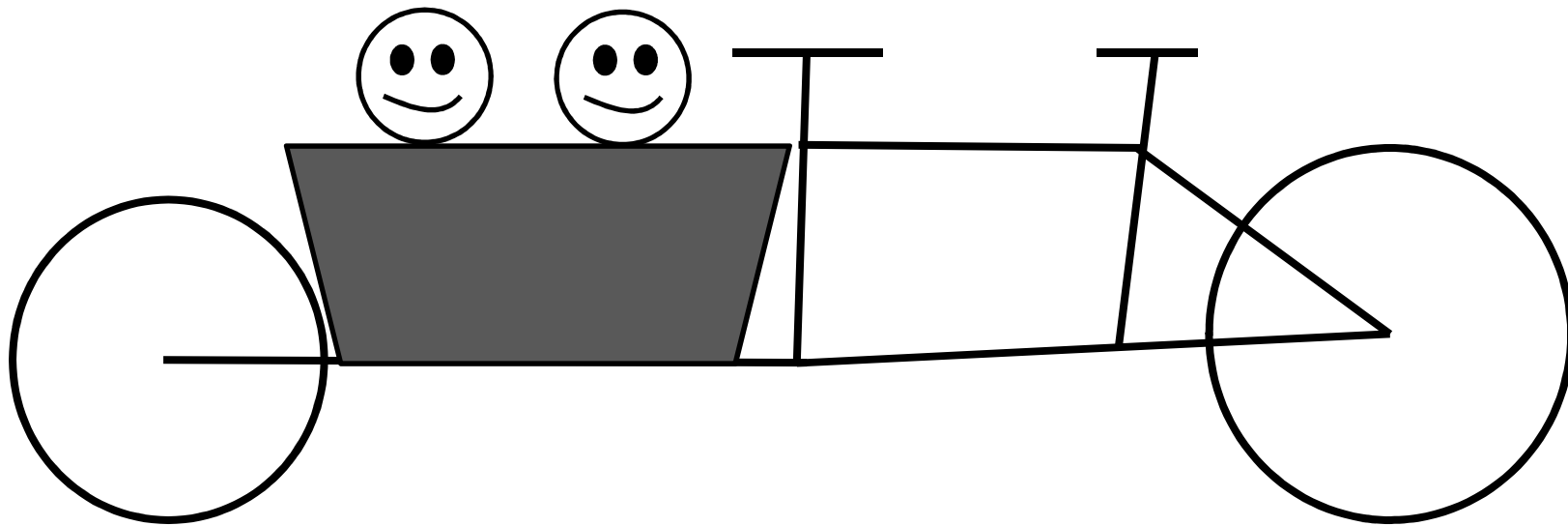


ILM/Zacke 2016

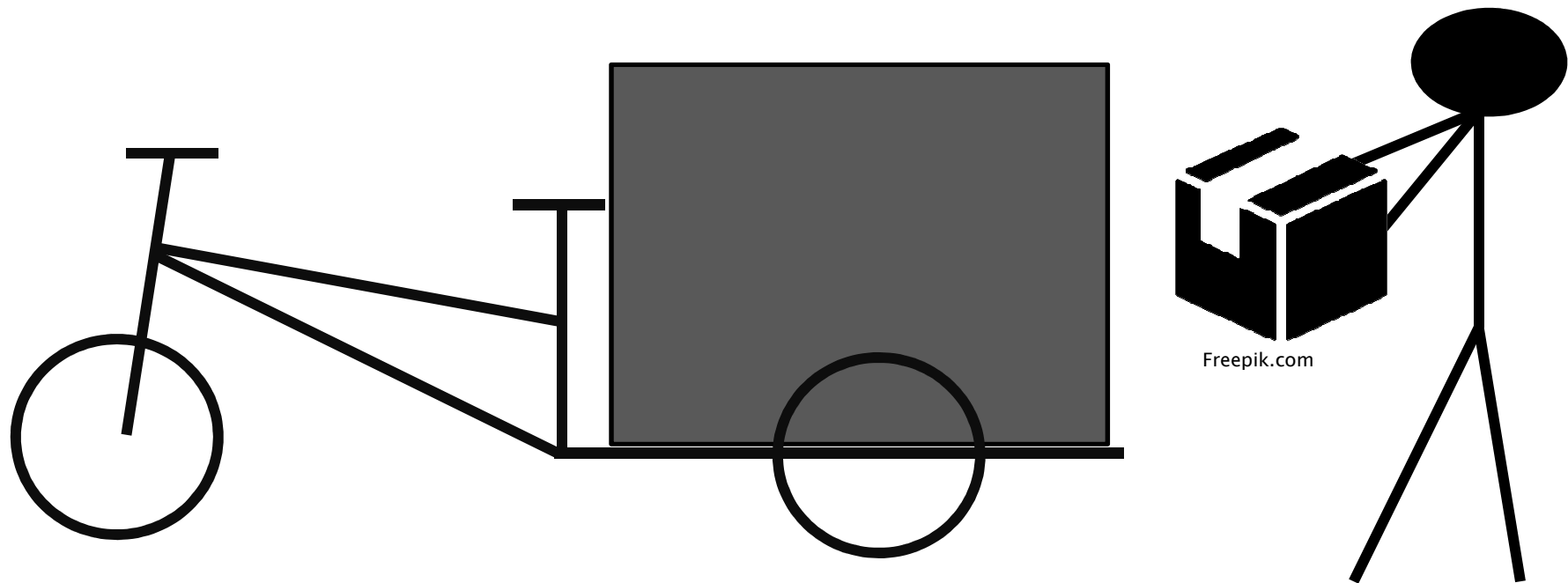
- LCA-comparison of vehicles for urban transport
- Cargo-bikes have very low emissions
- Main source of emissions is usage (e-CB)

Current situation of cargo-bikes

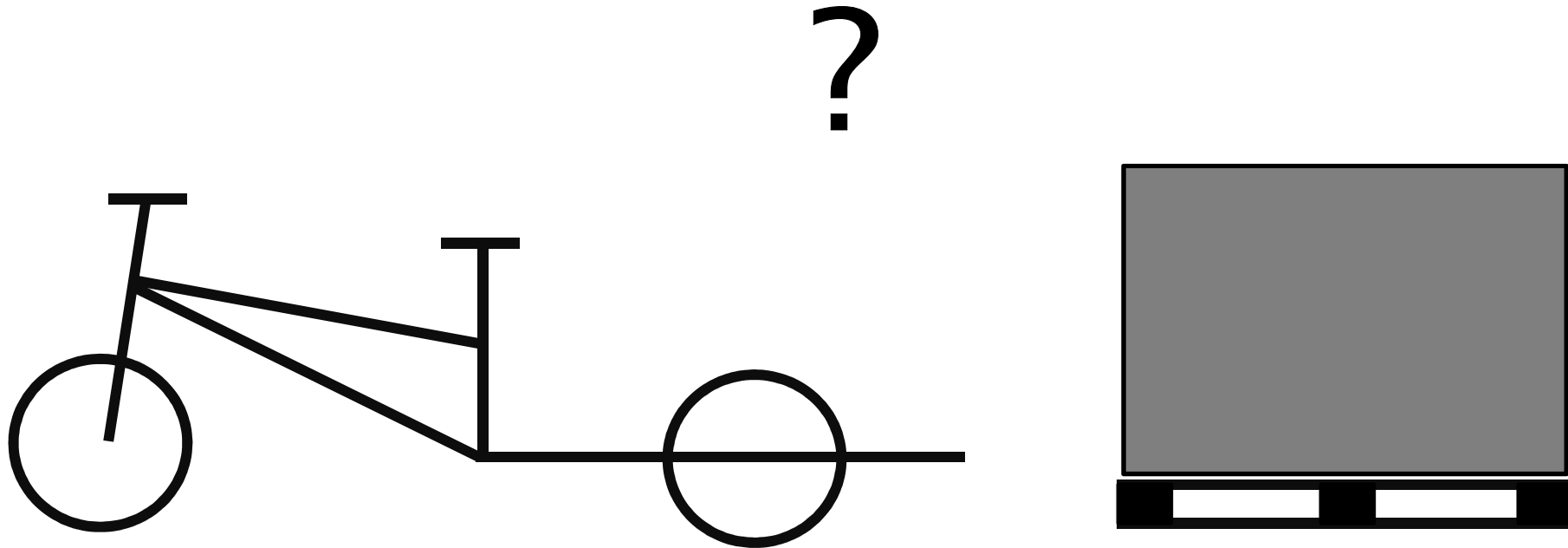
Cargobikes known



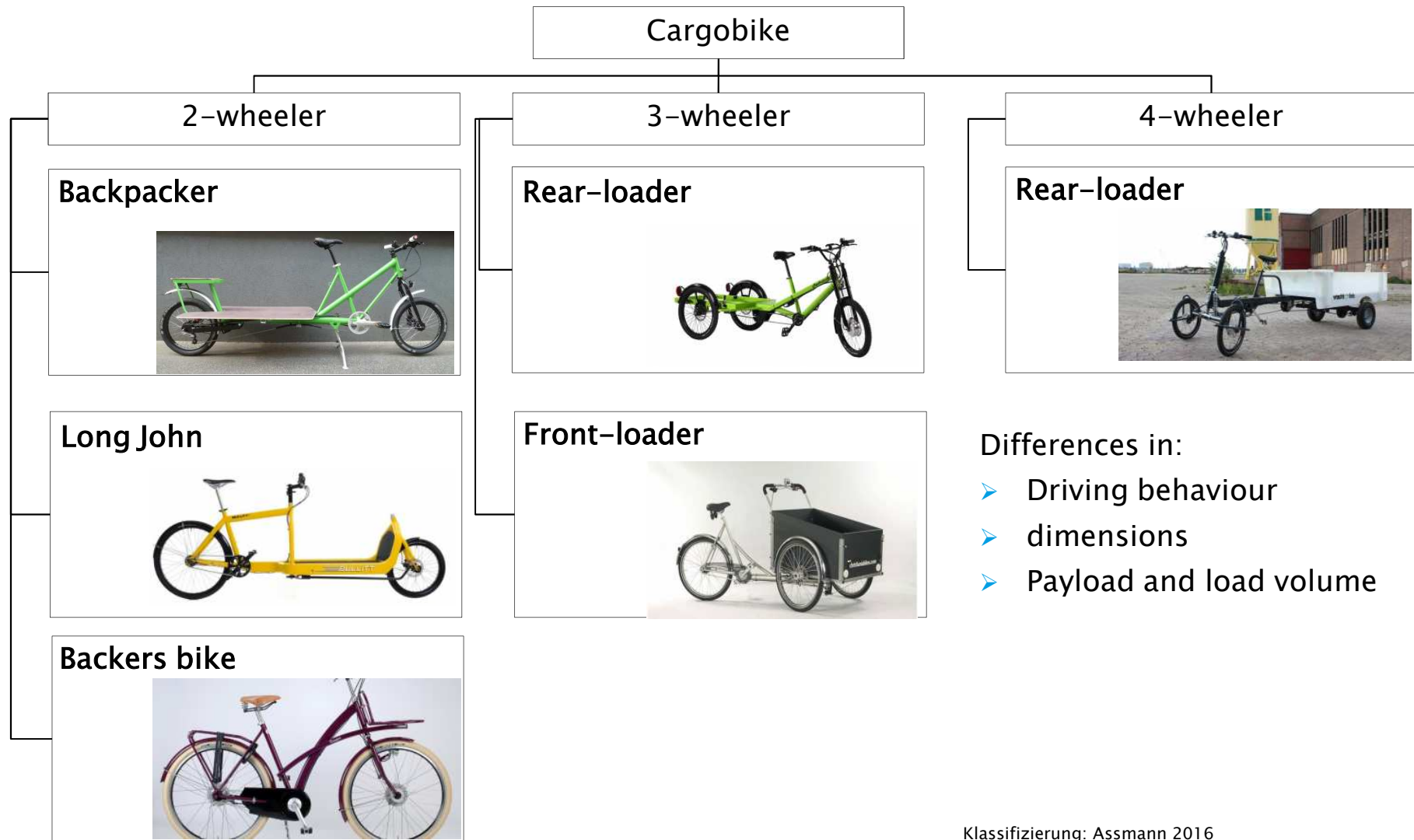
Cargobikes in progress



needs to be developed

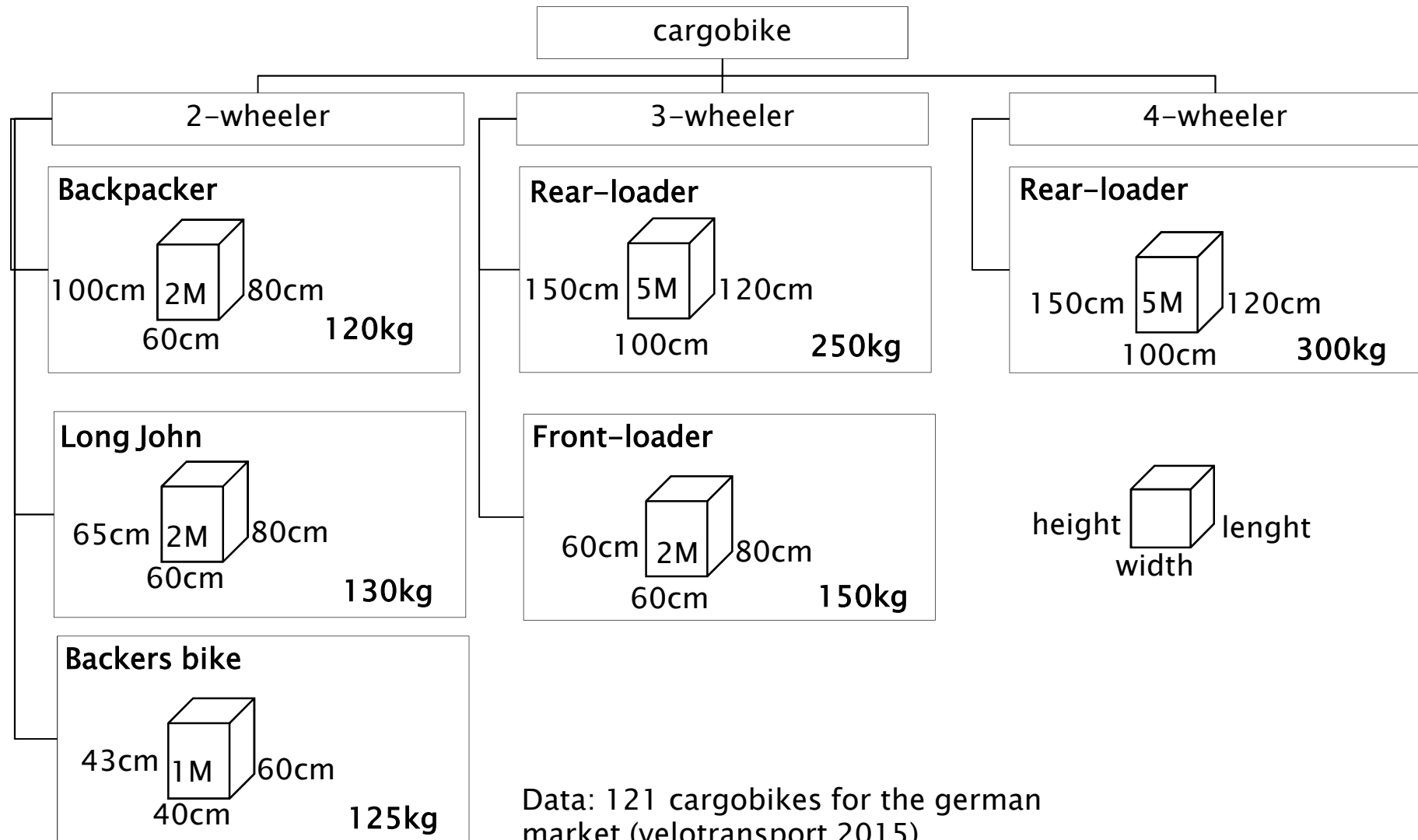


Classification of cargobikes



Klassifizierung: Assmann 2016
Abbildungen: www.velotransport.de / heavypedals.at

Load characteristics of cargobikes



Nach Assmann 2016

Cargo-bikes for pallets



<http://www.radkutsche.de/>



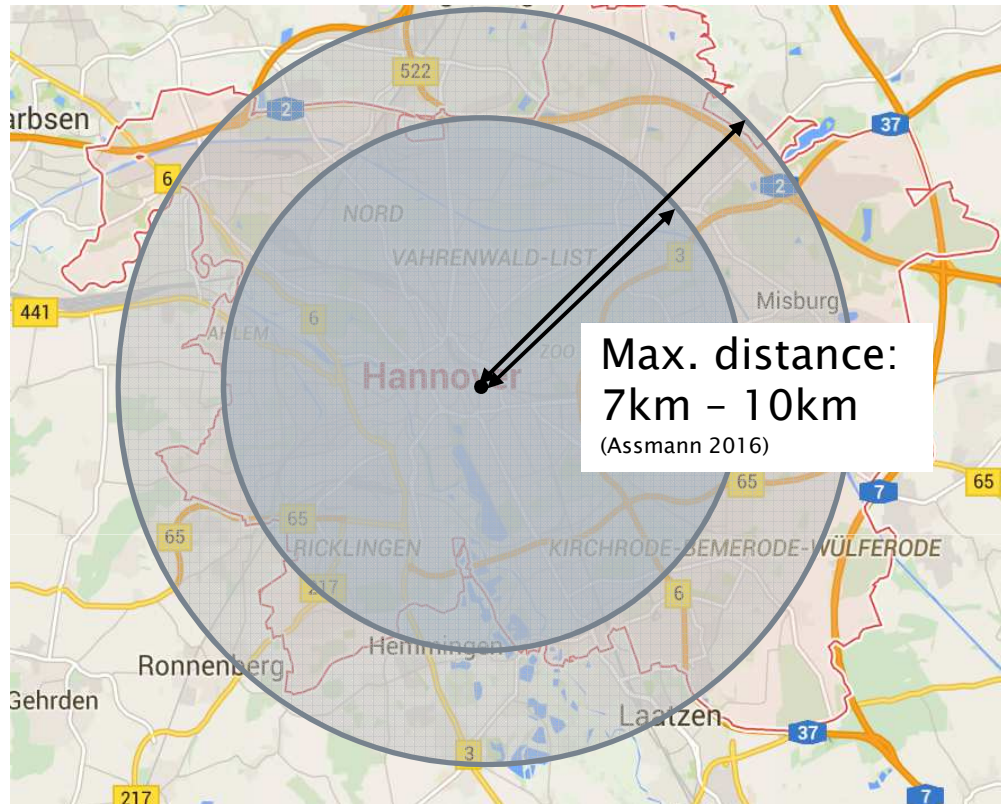
pedalpower.de



<http://www.cyclesmaximus.com/>

Company	Radkutsche	Company	PedalPower	Company	Cyclus Maximus
Model	Musketier	Model	Grizzly	Model	Trike
Cross weight	300kg	payload	300kg	payload	250kg

Range of cargo bikes



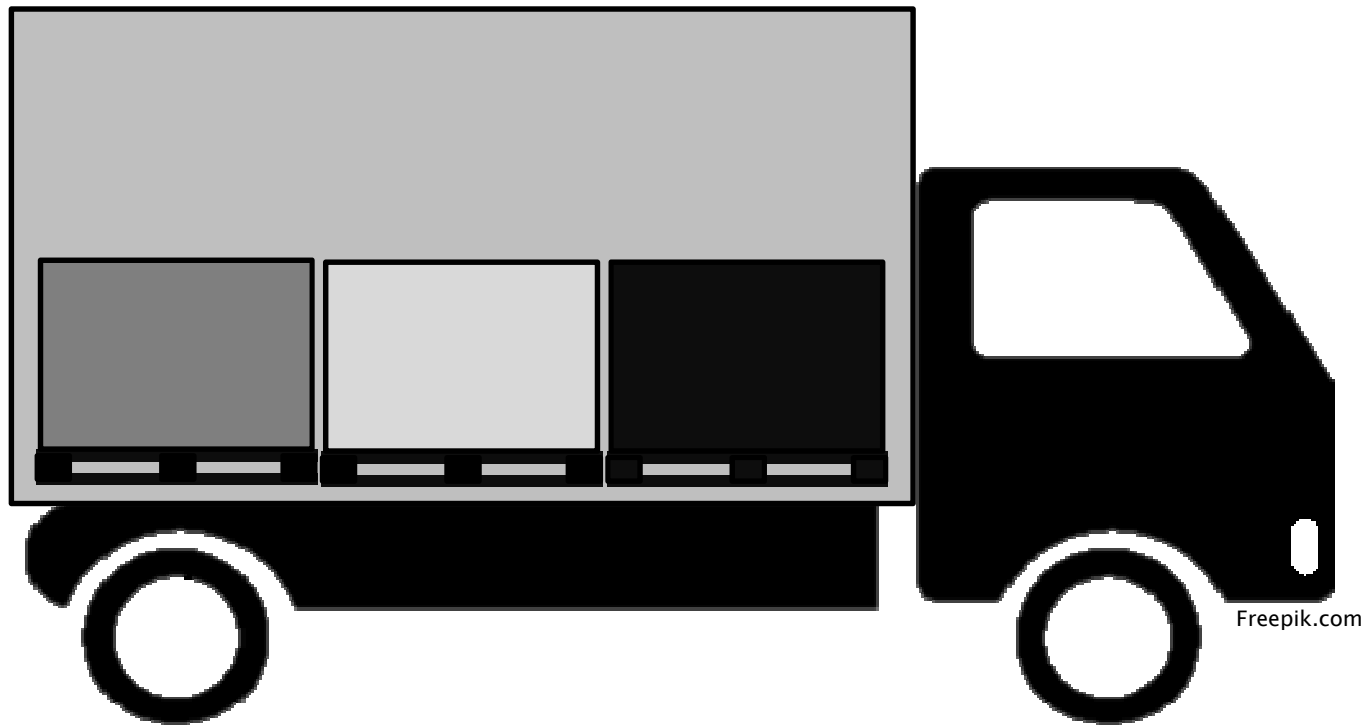
Maps.google.com

- Capacity of battery major problem

Daily distance	(Gruber 2015)	(Riehle 2012)
max	100 km	120 km
mittel	48 km	

Why transporting pallets?

part load traffic as potential



10 Bill. € Turnover in Germany (DLSV 2015)

Deeper figures about part load in cities

Share of deliveries in cities by operator

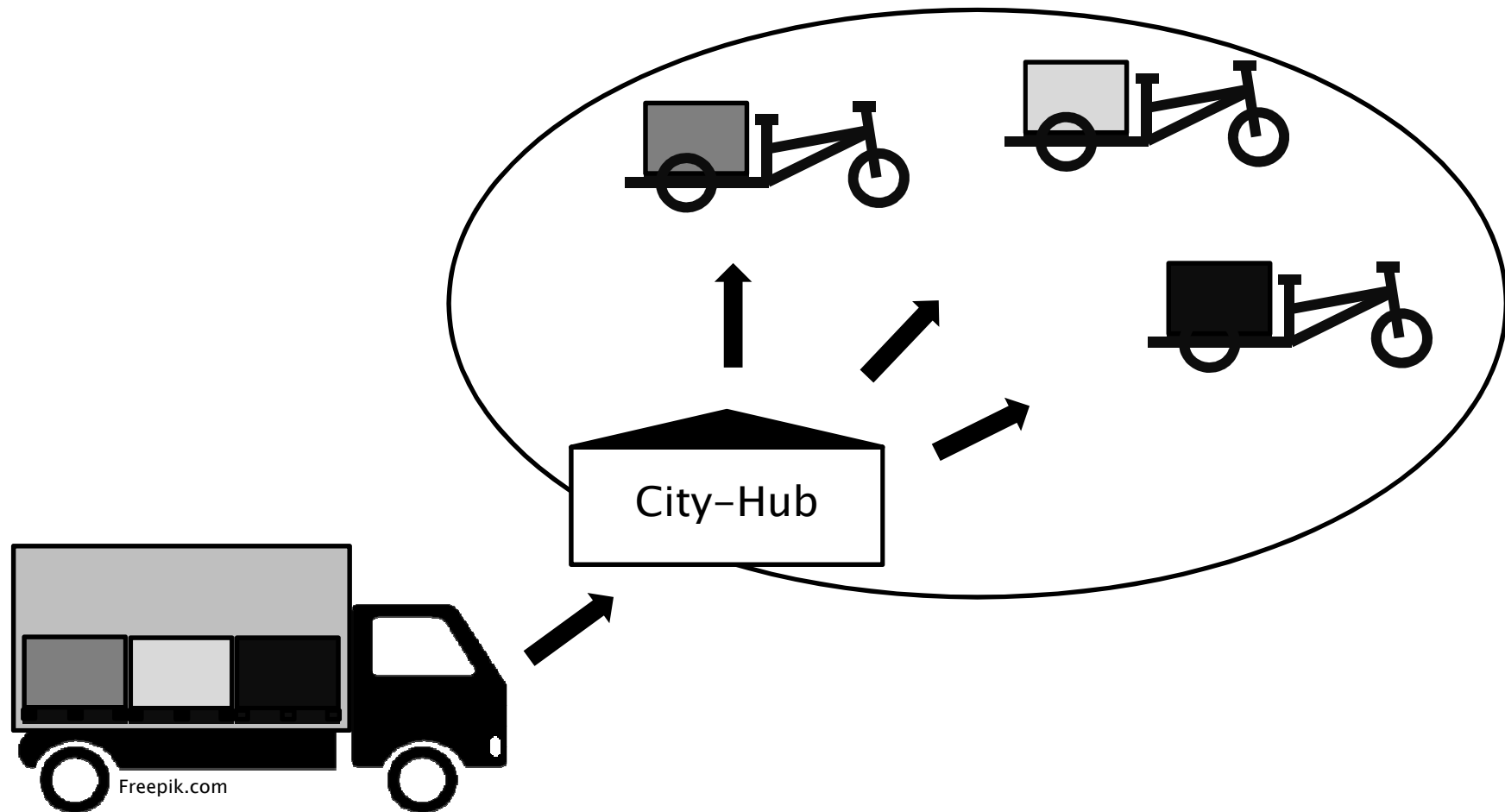
operator	Munich 1999	Bremen 1995	Osnabrück 1995	Hamburg 1992	Hannover 1996	Frankfurt 1993	average
Own account	32,4%	56,5%	44,5%	56,1%	44,0%	44,7%	46,4%
CEP & Post	17,3%	28,2%	37,1%	27,2%	27,0%	28,2%	27,5%
Forward er	43,7%	15,3%	18,3%	16,7%	29,0%	27,1%	25,0%
Different	6,6%	–	–	–	–	–	1,1%



Duisburg Essen () S.221

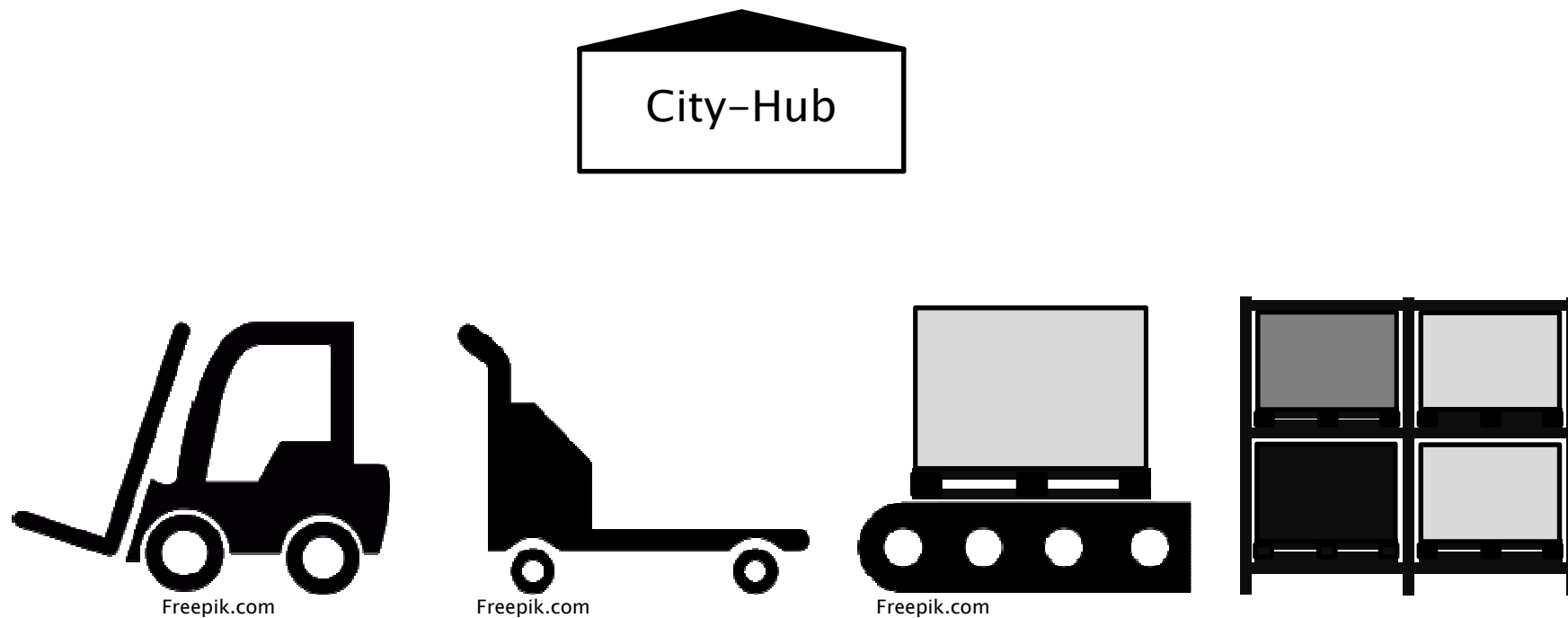
- Part load is typical for forwarder
- Knowledge and data about urban goods flows is scarce

Crossdocking as city-hub



Handling of pallets and cargo-bikes

Handling equipment for crossdocking

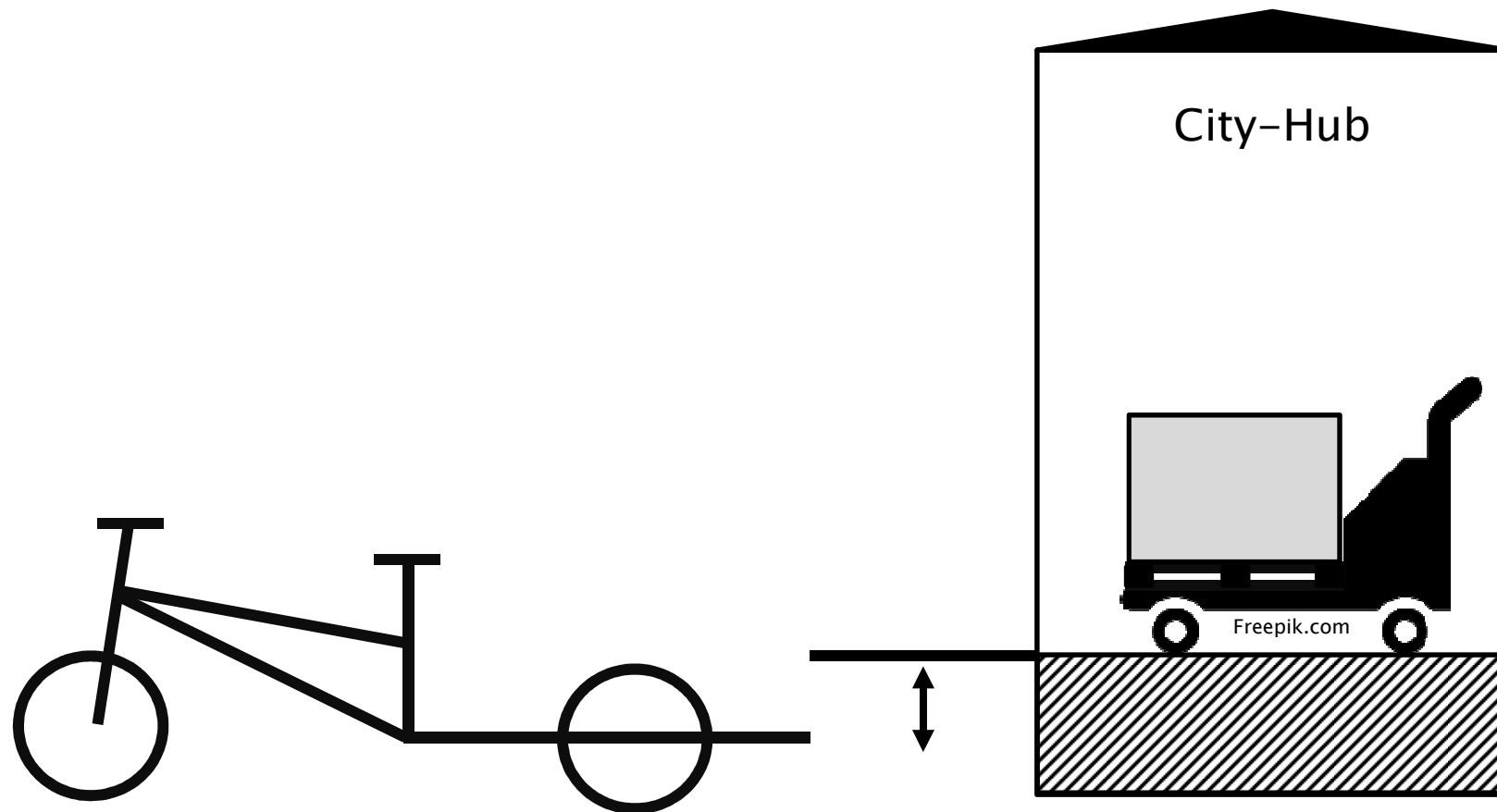


Conventional ramps

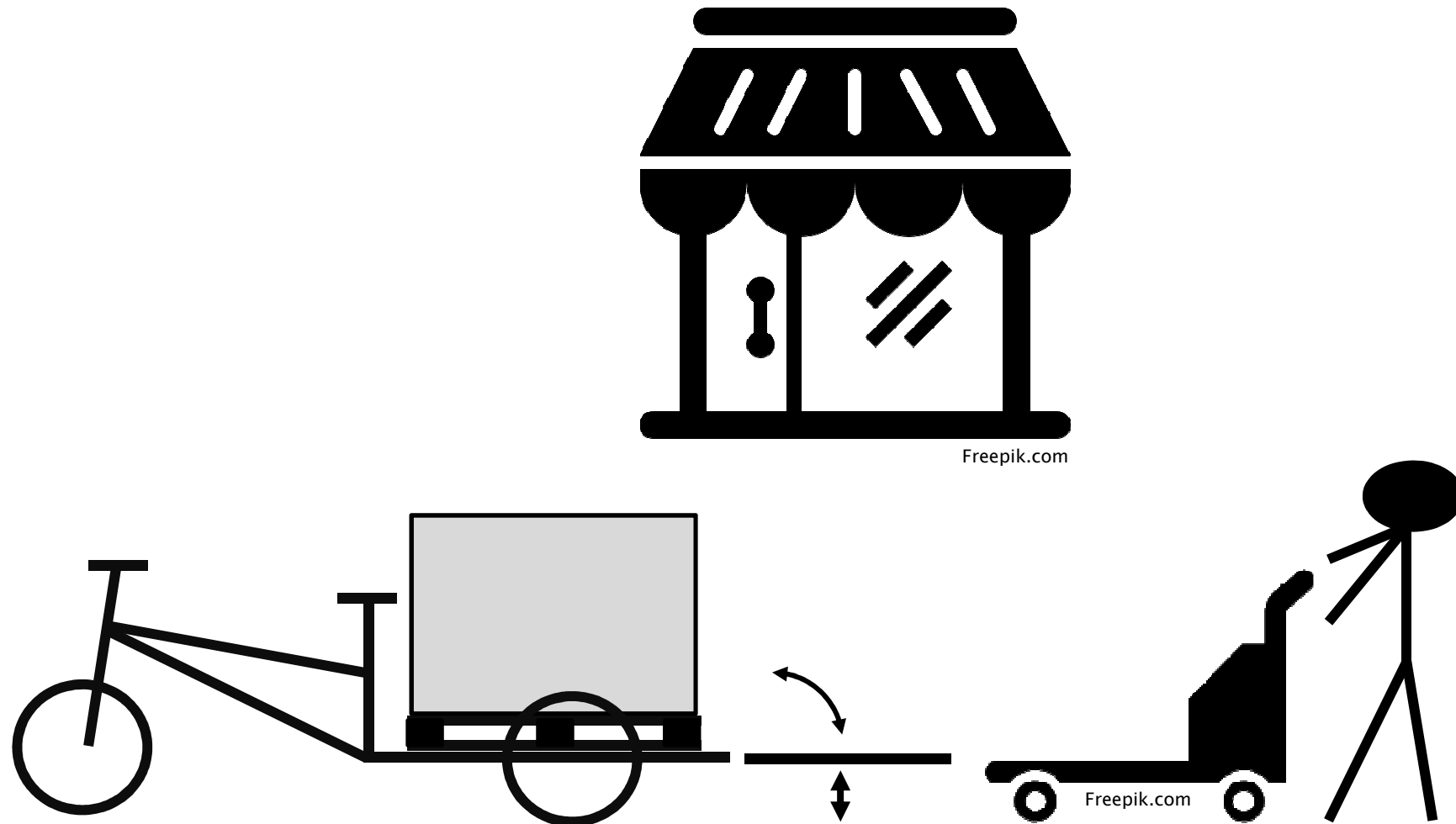


<http://www.bs-dienstleistungen.de/media/bilder/Lager.jpg>

Ramps – do not waste space inside



What if we do not have ramps – often the case

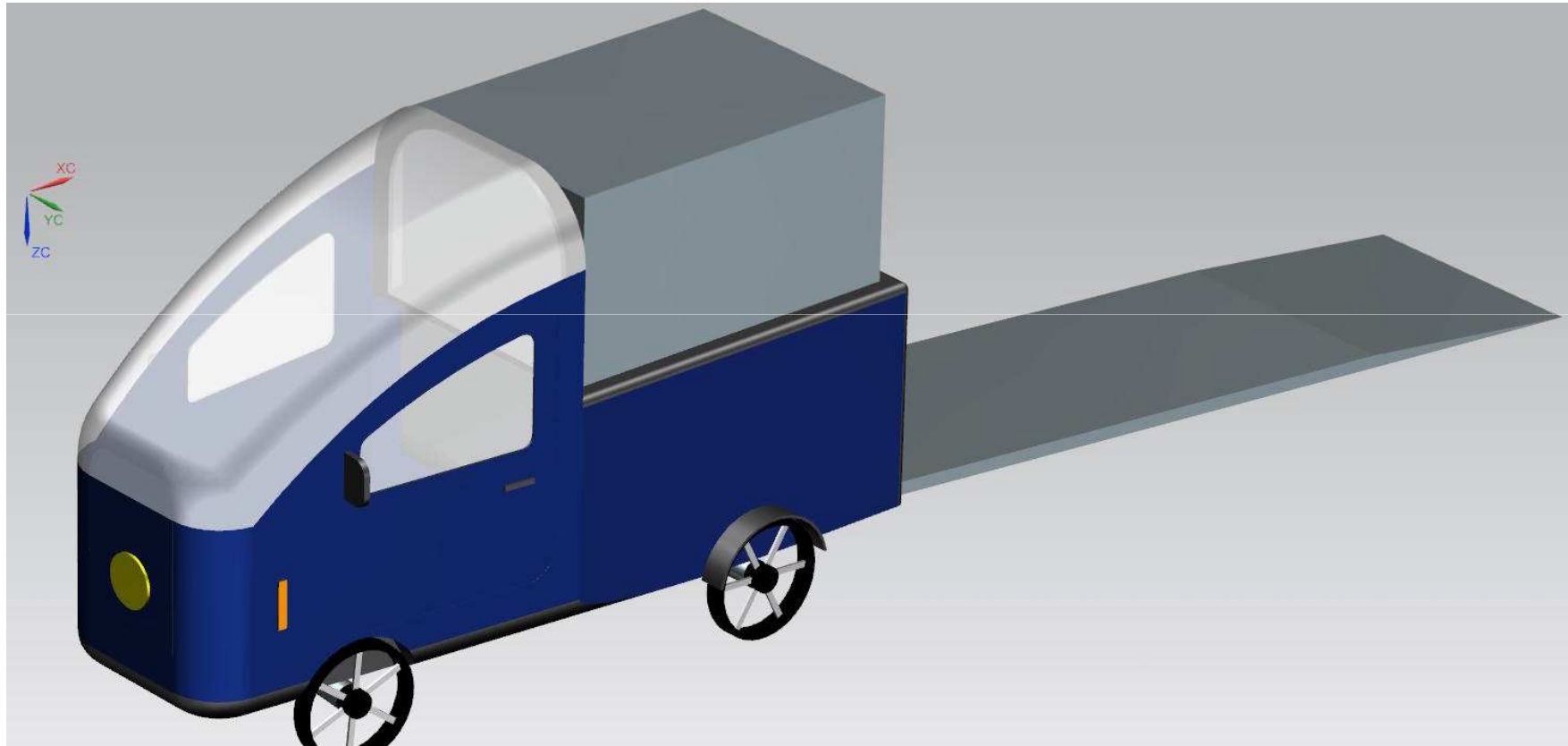


Taillifts



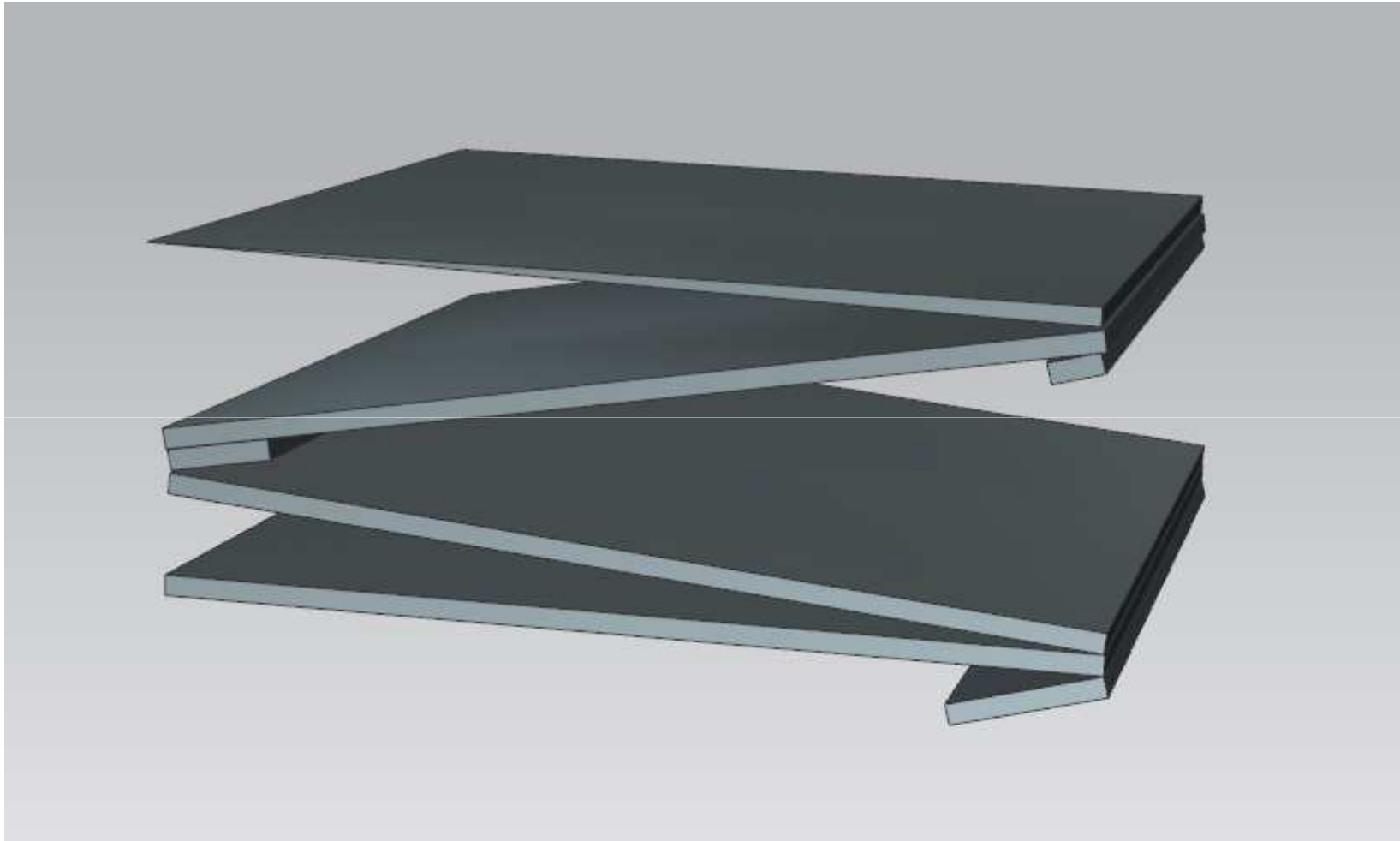
http://www.baer-cargolift.com/typo3temp/fl_realurl_image/de-meyer1-DE.jpg

Taillifts for cargo bikes – a design concept



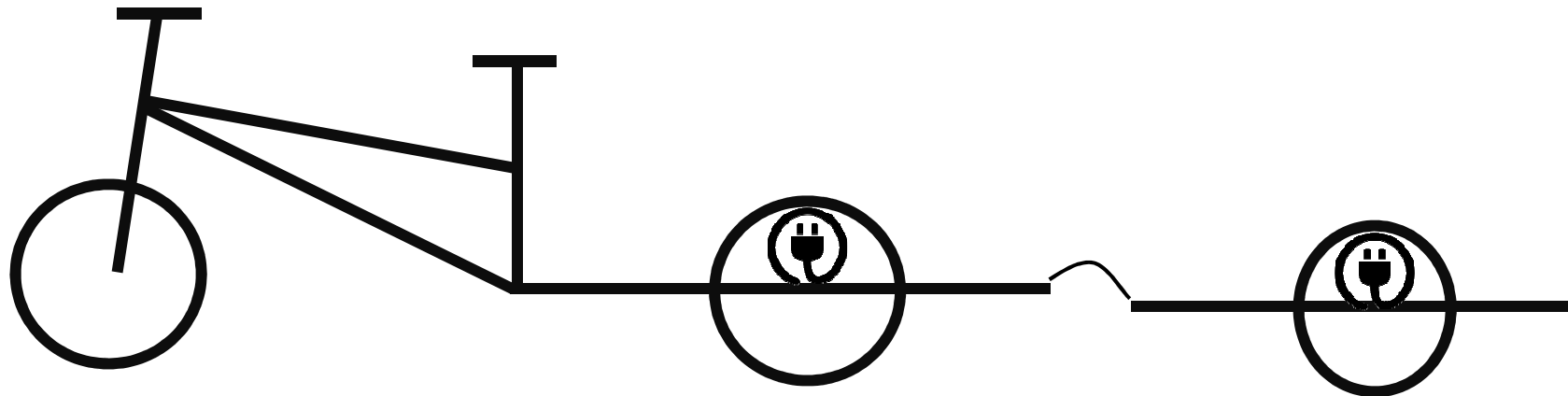
ILM 2016

The taillift should be foldable

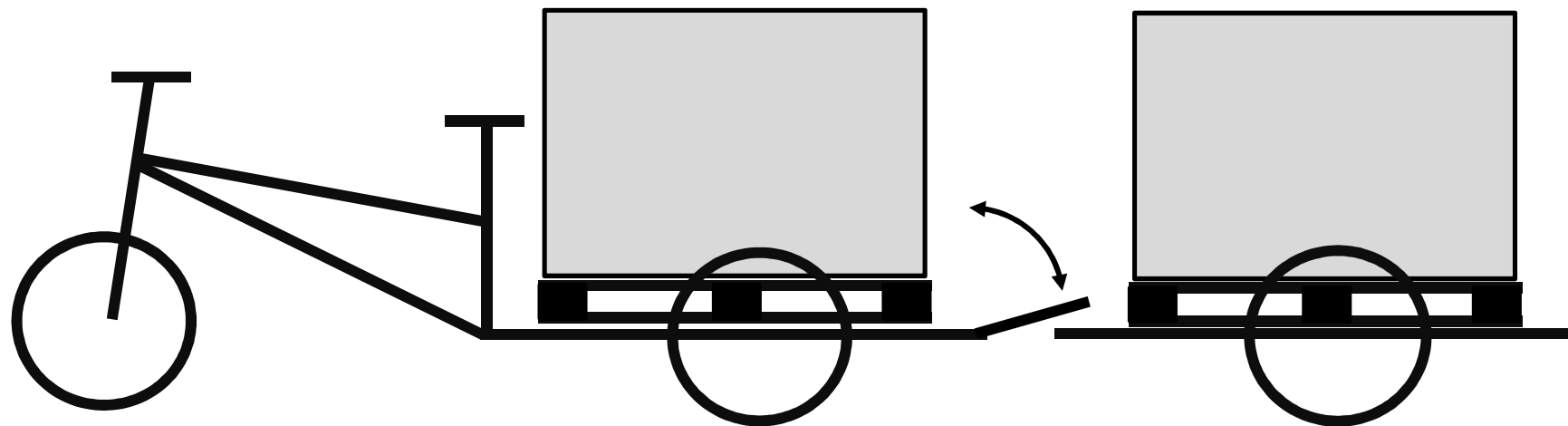


ILM 2016

Self powered trailer



Articulated Cargobike



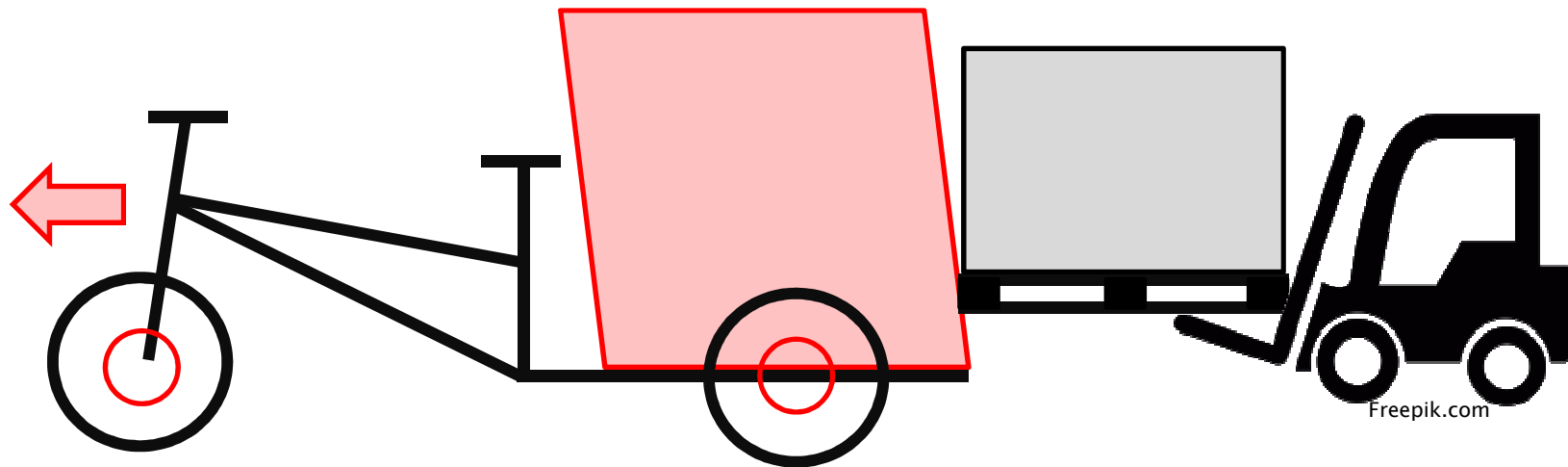
Articulated lorry



<http://holzfunktion.ch/wp-content/uploads/2013/11/Logistik-Durchladen-Motorwagenzu-Anh%C3%A4nger-3-von-4.jpg>

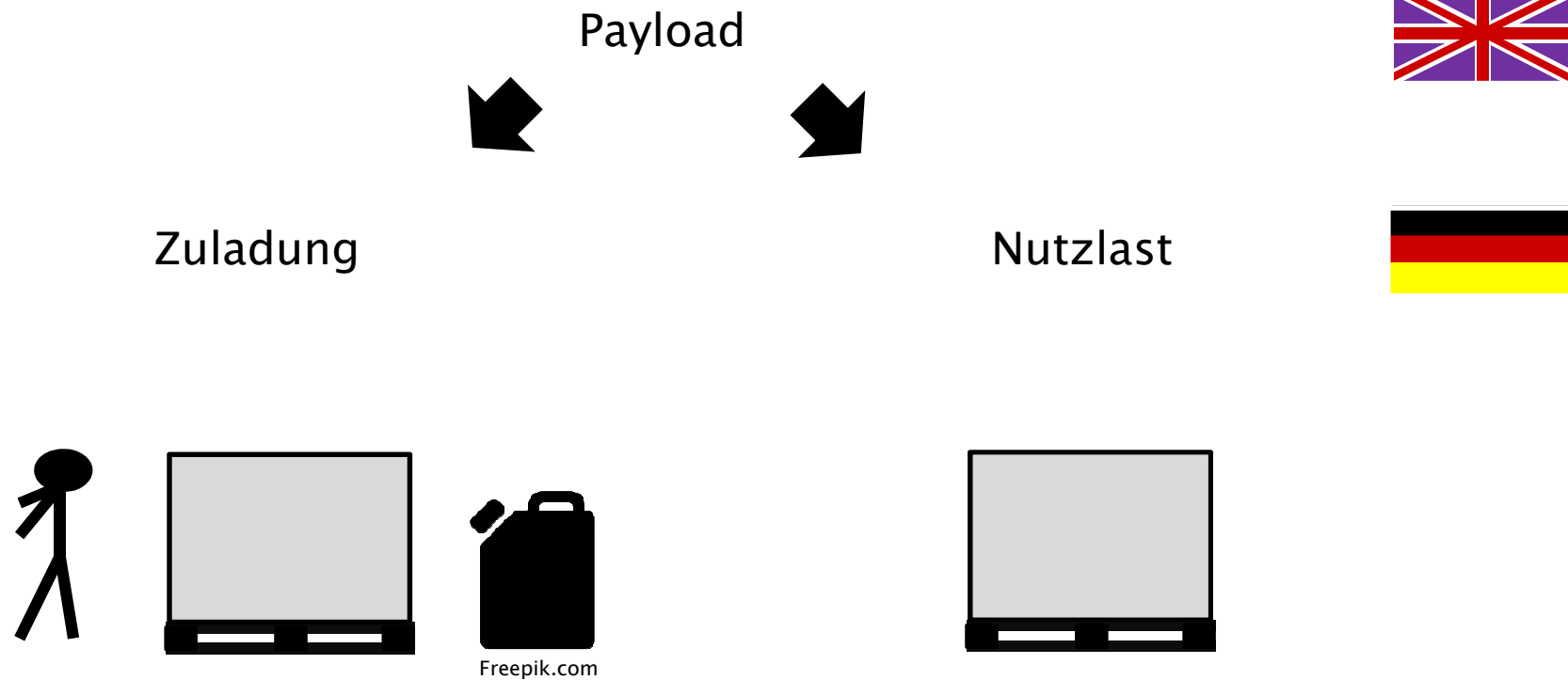
Important issues

Improve the cargobike

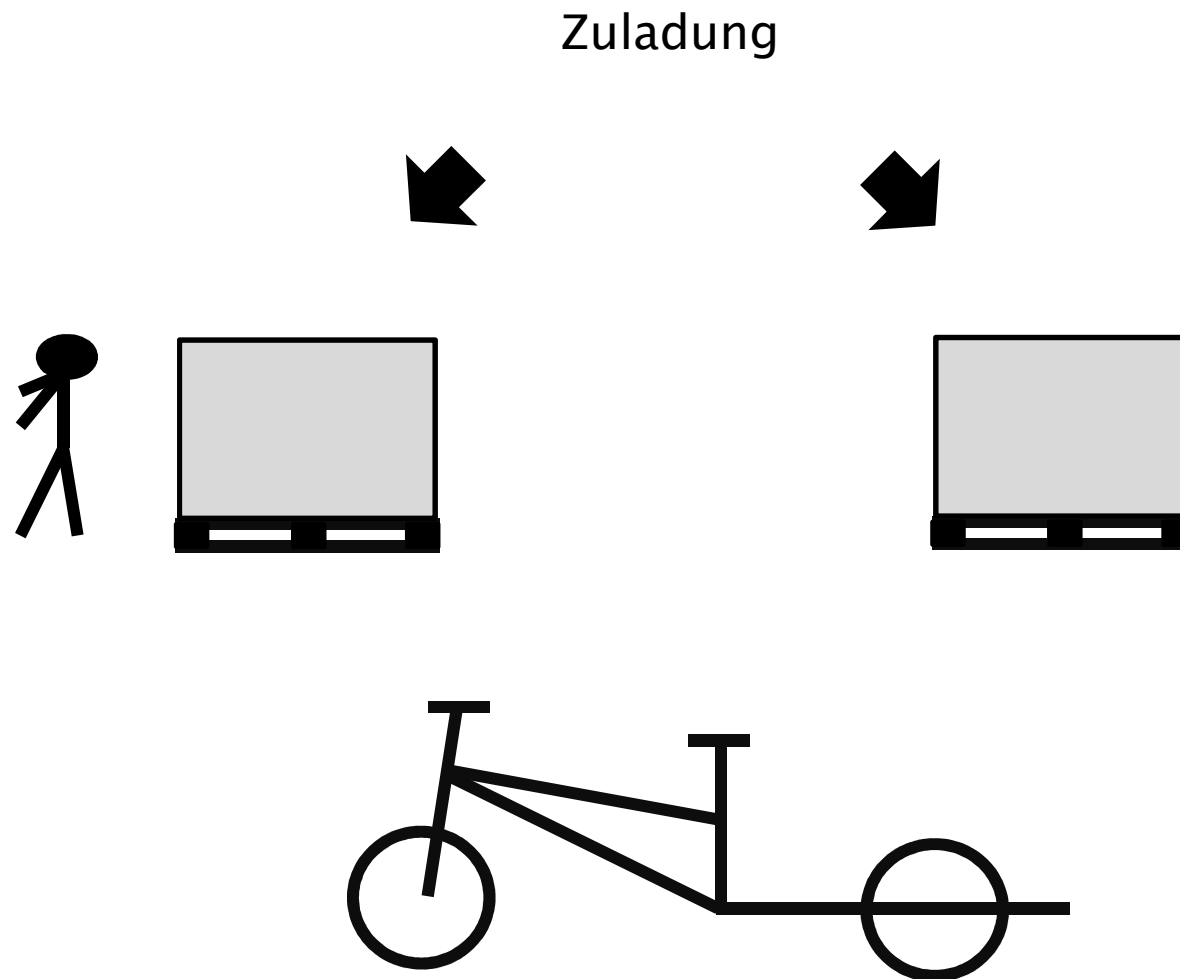


- Stability of brakes
- Safety issues on roads and cyclepaths
- Acceptance of public

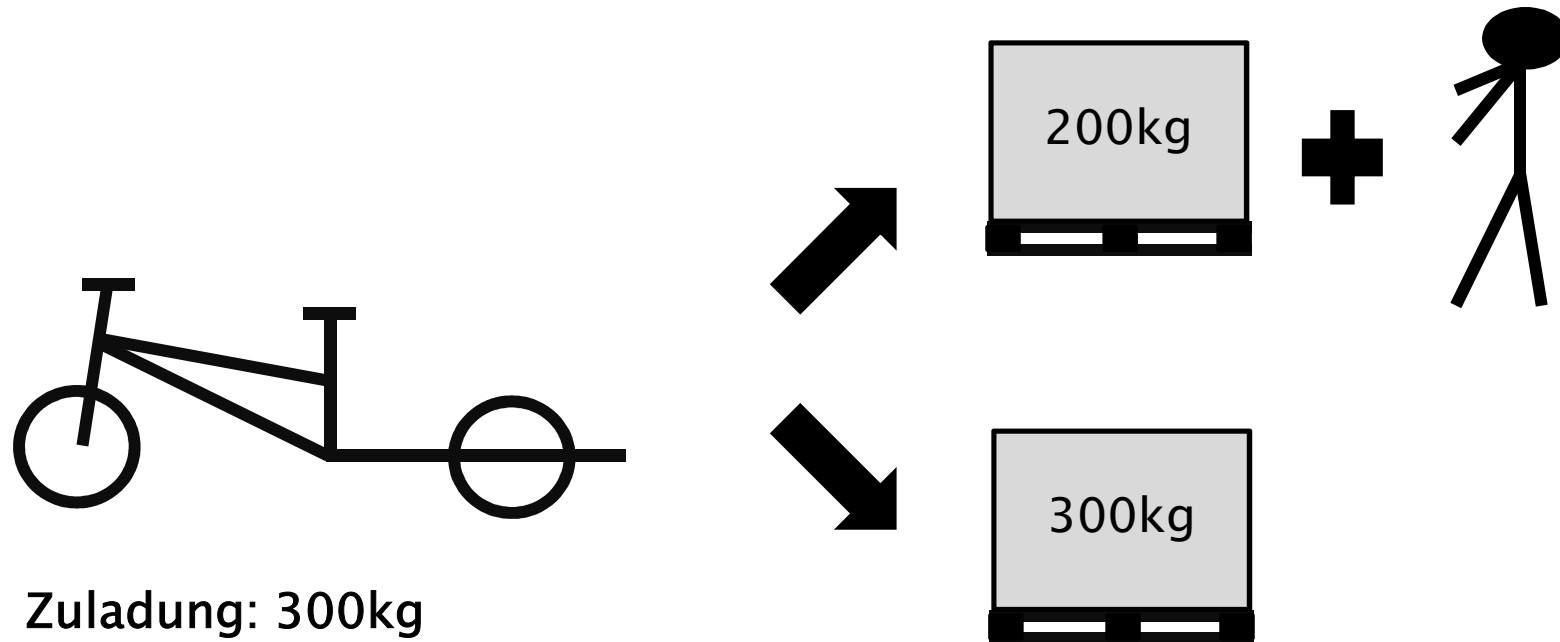
The definition of „payload“ – just a german problem?



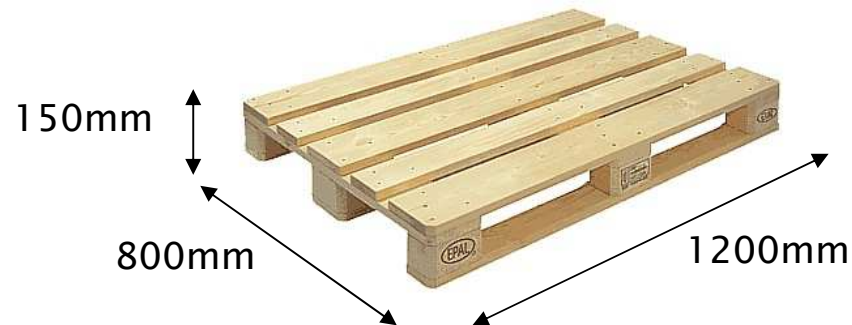
Unclear usage of „Zuladung“ with cargobikes



The definition of „Zuladung“ – a german problem

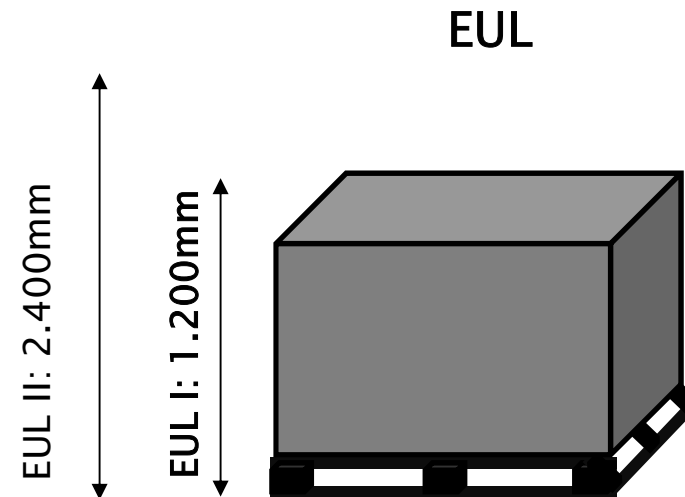
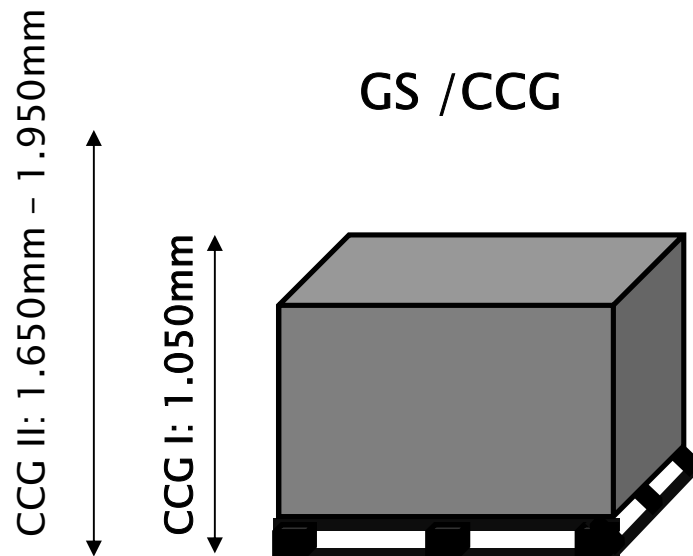


The idea of pallets and standardization

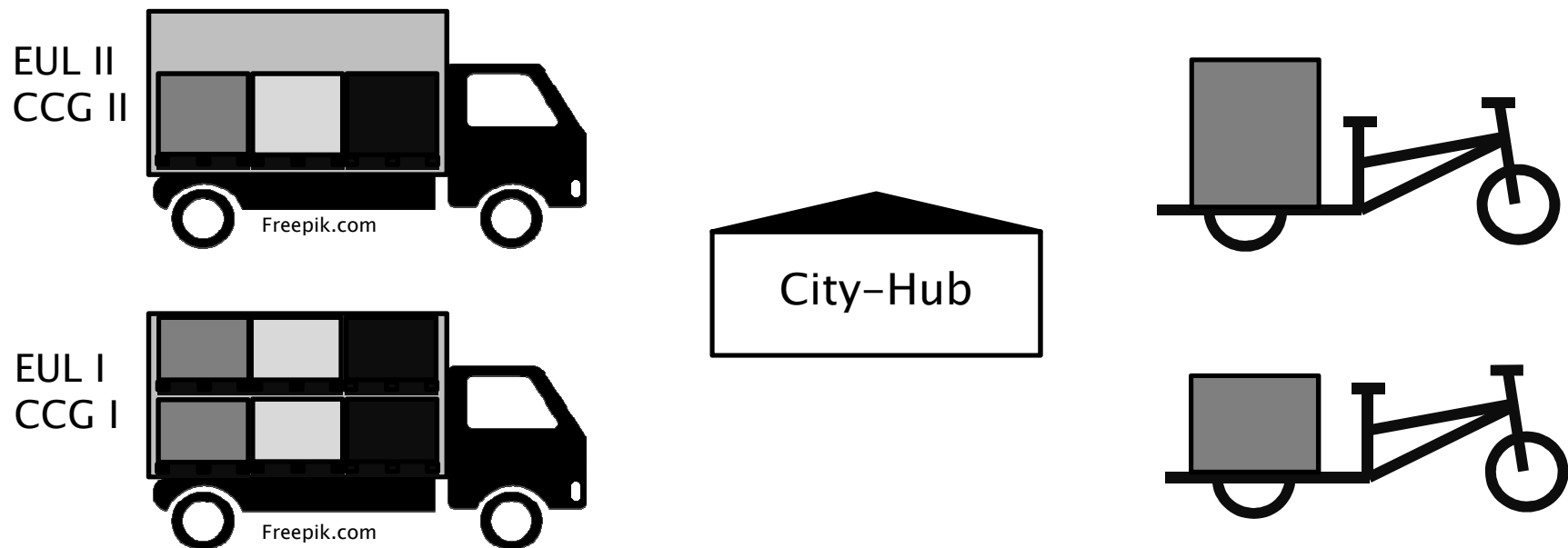


DIN EN 30783
DIN EN 13698
DIN 15147

Pallet loading standards:

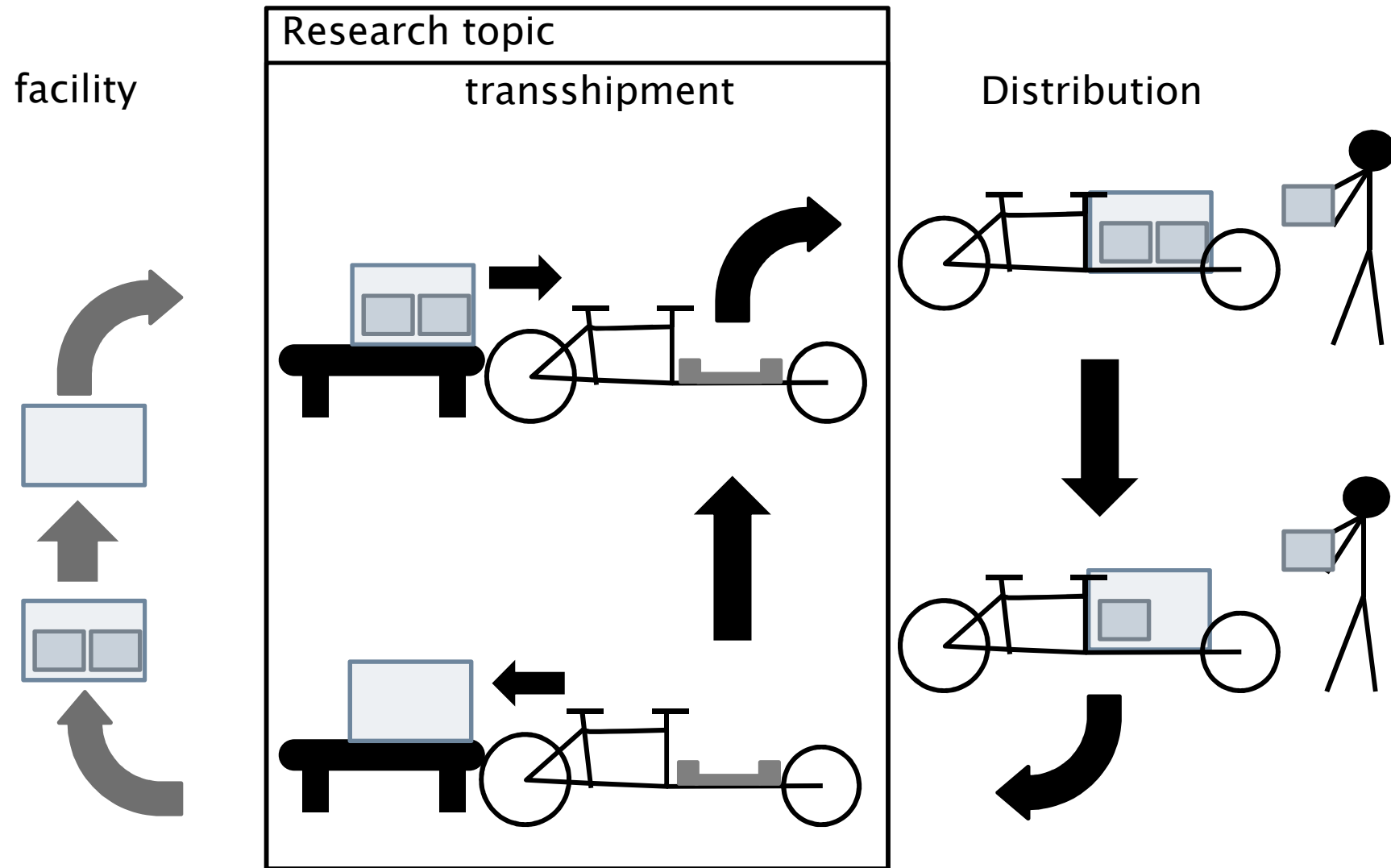


Dimensions in depot-systems



Also possible with container-systems.

AWEEL – The Project



Thank You!