

City logistics innovations: game-changers or over-hyped curiosities

Professor Alan McKinnon

*Kühne Logistics University
Hamburg*

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Policy Session

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City Logistics / Urban Freight Problems

Coincidence of a high level logistical activity
and high density of population

Economic inefficiency:

high delivery costs

under-utilisation of vehicle fleets

traffic congestion

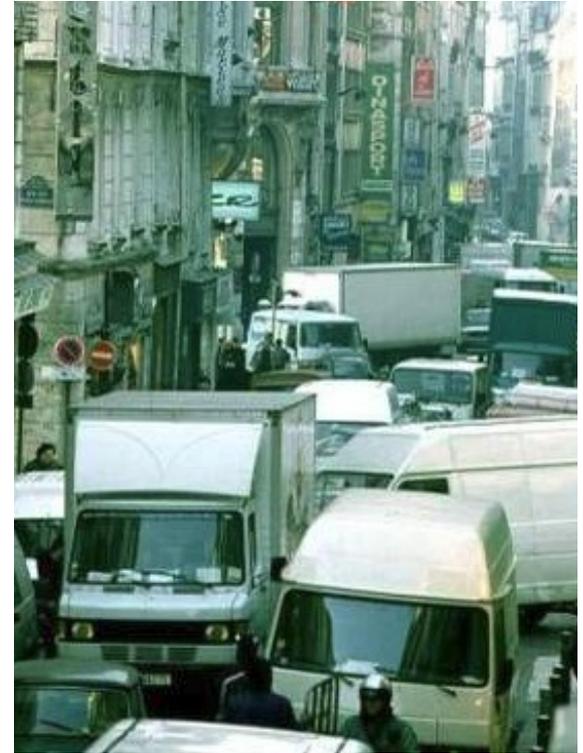
Environmental damage:

air pollution / climate change

noise irritation

accidents

visual intrusion

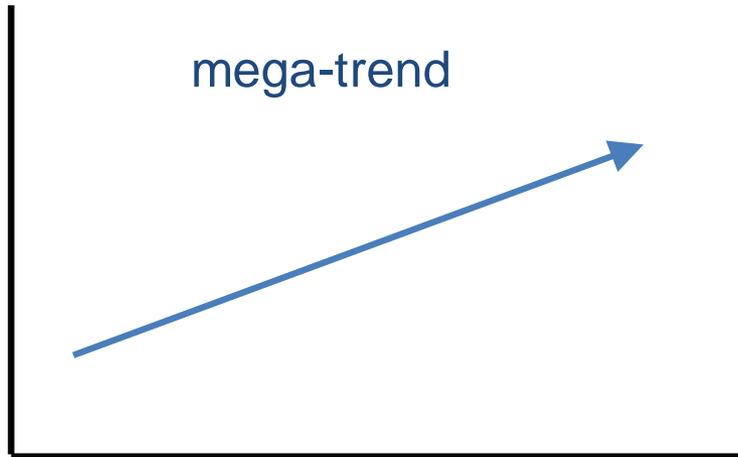


EU target:

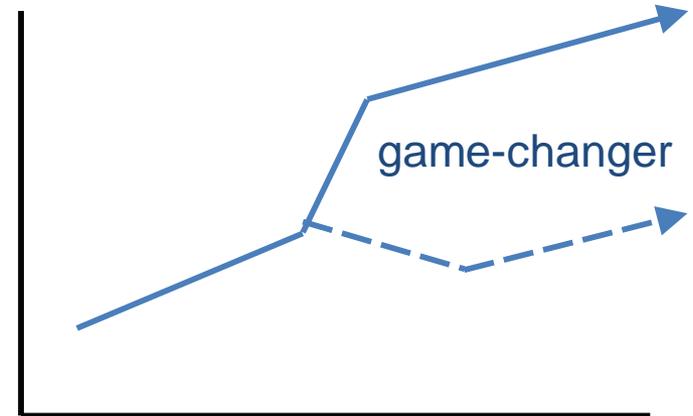
'Achieve essentially CO₂-free city logistics by 2030 – in major urban centres'

2011 Transport White paper

Logistics Futurology



continued urbanization
growth of urban freight traffic
decentralization of retailing
switch to online retailing
greening of vehicle fleet
etc



omni-channel logistics
unattended delivery
crowd-shipping
freight 'uberization'
drones
3D printing

City Logistics Innovations: *from curiosity to mainstream?*

modal shift

cargo cycles



cargo trolleys



cargo trams



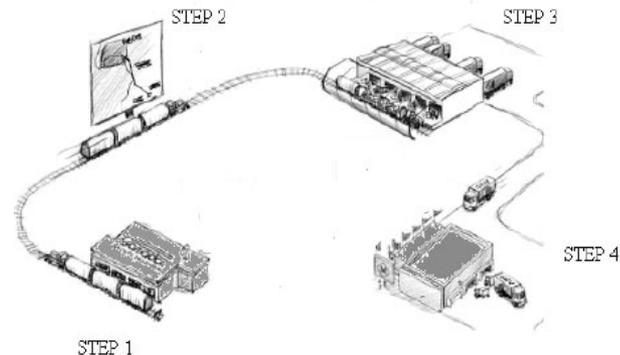
underground rail



water-borne freight



surface rail

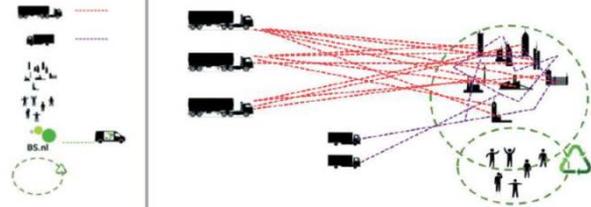


MONOPRIX

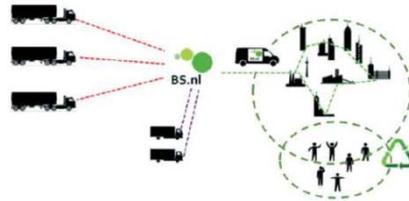
operational innovations

urban freight consolidation schemes

Cities without Binnenstadservice



Collective warehouse Binnenstadservice



mobile transshipment points



delivery servicing plans (DSP)

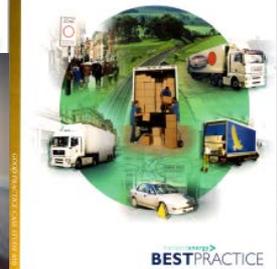
	Ferrari Regent St	Consolidation of every 3 loads into 1
	Anthropologie Regent Street	Consolidation of 80-100 small supplier consignments / week into 4 loads
	TfL (Palestra)	Deliveries reduced by 20% (from 250/week)
	Emirates Stadium	Deliveries reduced by 20%, consolidated food & milk deliveries
	Fire Brigade	Consolidation Centre -£90,000 supply chain saving
	University	Stationery deliveries reduced by 80% - average invoice value £28, cost to process £20

off-hours / night-time delivery



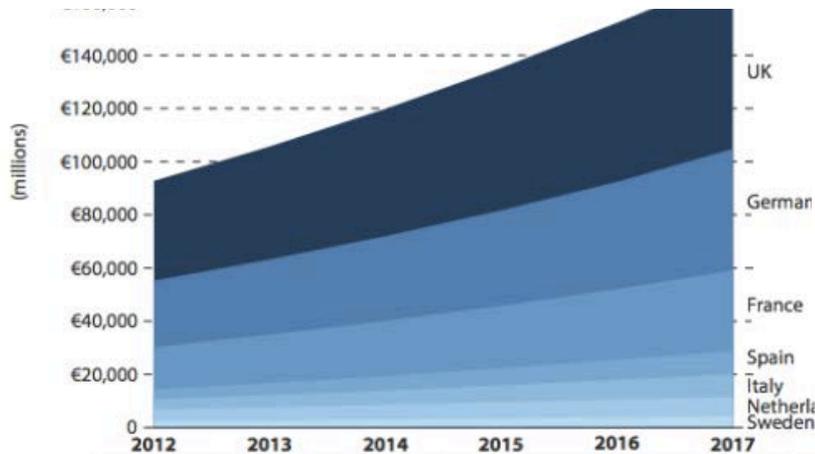
freight quality partnerships

public policy innovations

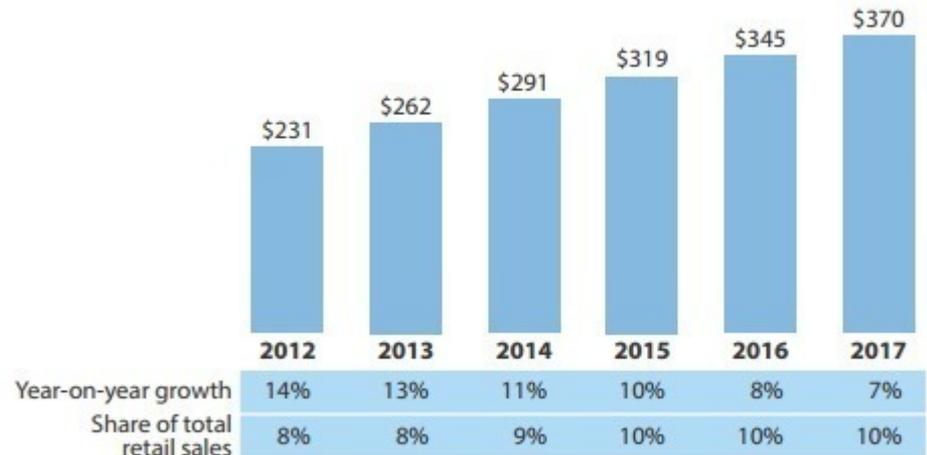


Growth of Online Retailing in Europe and the US

Growth of European Online Retail Sales 2012-2017

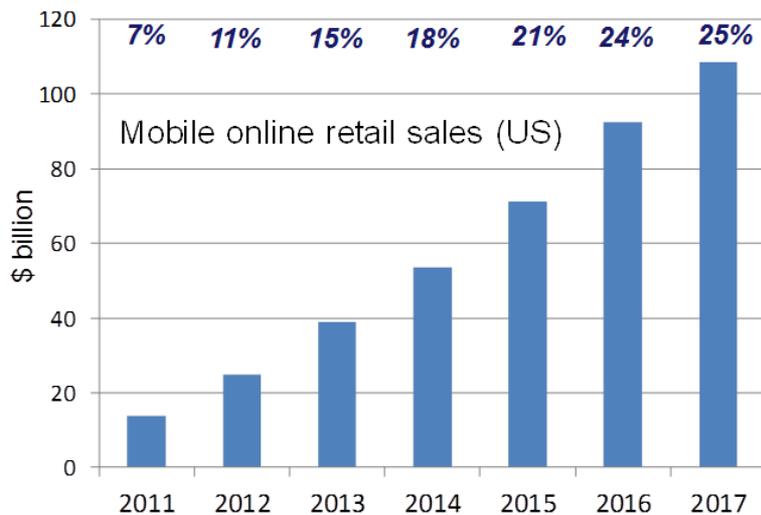


Growth of US Online Retail Sales 2012-2017



Source: Forrester Research

% of total online retail sales



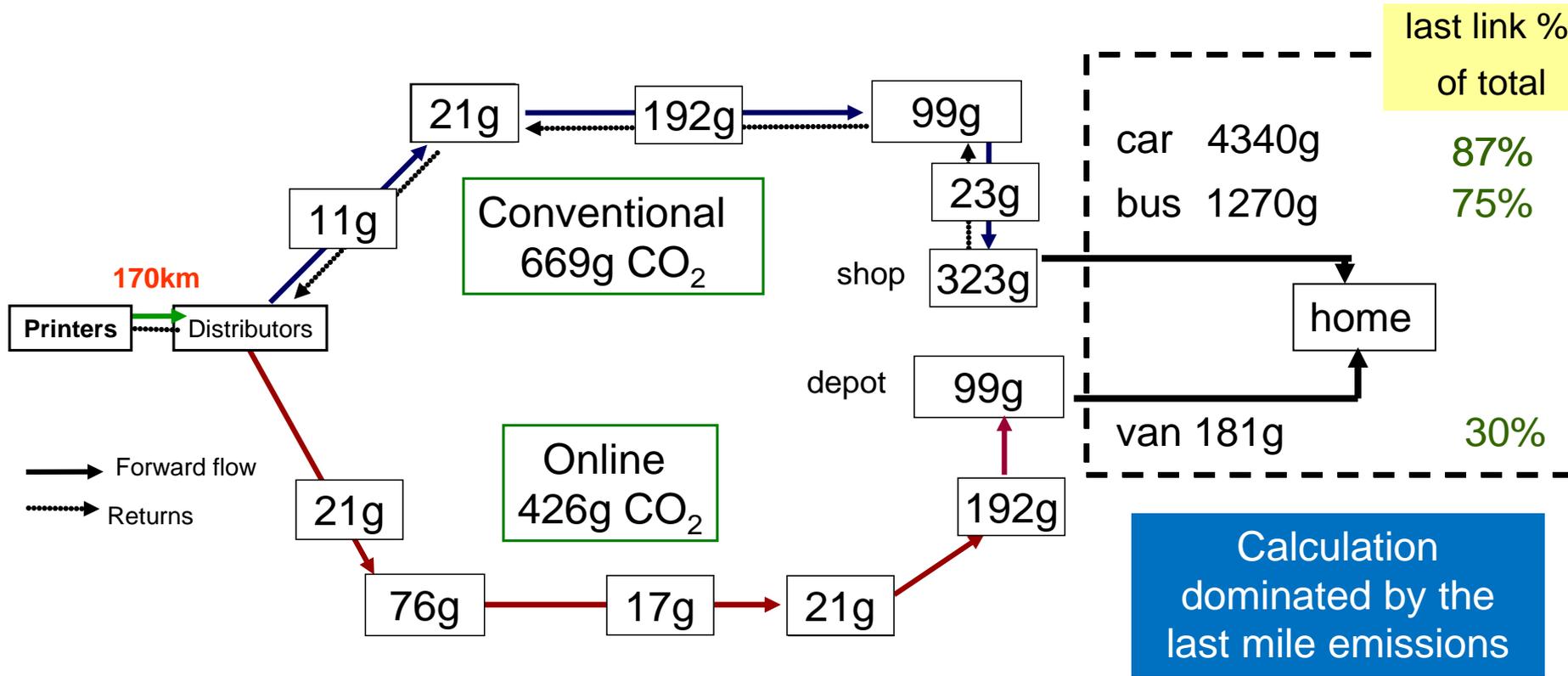
Source: eMarketer (2013)



omni-channel logistics

Comparison of the Carbon Intensity of Conventional and Online Book Retailing

Source: Edwards, McKinnon and Cullinane, 2009



Online retail supply chain's CO₂ advantage:
Over shopping by car : 8.3 x *Over shopping by bus: 2.8 x*

Underpinned by numerous assumptions

Unattended Delivery Options for Online Consumer Orders

Collection points



Home access system



fixed

External boxes

mobile



train station



Integral box



park and ride

unattended delivery to the home

average 40% reduction in trips, fuel use and emissions
based on Finnish research

rapid growth of 'click-and-collect' from shops / 'pick-ups'

delivery to the car



Logistics of online retailing not simply a substitution of a car-borne shopping trip by a van delivery to the home – it is broad diversification of order fulfilment channels and methods

Crowd Sourcing of Parcel Deliveries: *Crowdshipping*



- exploiting new spirit of collaboration
- commercialisation of social networking

redefining interface between passenger and freight transport

Benefits:

- accelerates last mile distribution
- more flexible, life-style-adjusted delivery
- fewer failed deliveries
- low marginal cost / improved asset utilisation
- lower traffic levels, emissions and congestion

Problems:

- increased risk of theft, loss and damage
- inadvertant delivery of illicit products
- vulnerable to criminal / terrorist activity



Amazon trialling delivery of parcels by taxi in Los Angeles



Could Amazon plus Uber be the click-and-collect dream combo?

Andrew Hill | Author alerts | Oct 15 2014 11:50 | 2 comments | Share

Financial times (15 Oct 2014)



Distribution by Drone: *will city logistics take to the air?*

'..the next big paradigm in transportation' CEO of Matternet



10 reasons why distribution by drone is unlikely to work

Very limited distance range and payload weight – *in the absence of a battery miracle*

Impossible inventory trade-off between product range and decentralised distribution

Lacks the scale economies of hub-spoke distribution and last-mile groupage

Household reception system very difficult and costly to standardise and operate

Accident / liability risk: *to people, aircraft etc*



Security risk: *ideal target-practice for guns and air rifles*

Dependence on the weather



Public concern about privacy and environmental quality

Demand for premium same-day delivery – *small segment of online market*

Authorities very unlikely to approve use of urban air-space by delivery drones

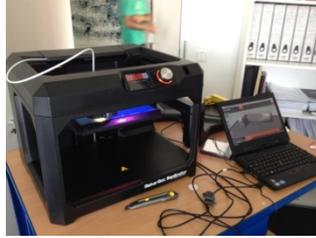


Overview of Small UAS Notice of Proposed Rulemaking

Drones are *'not a mass phenomenon'*

(Frank Appel, CEO of DHL)

3-D Printing / Additive Manufacturing / 'Fabbing'



- Bulk delivery of printer filament replaces many separate product deliveries
- Supply chain simplification – *eliminates numerous nodes and links*
- Minimal return flow of unwanted product / waste

less traffic, fuel use and emissions

Need mass adoption to have much impact on urban traffic levels

Constraints on the Mass Use of 3D Printing

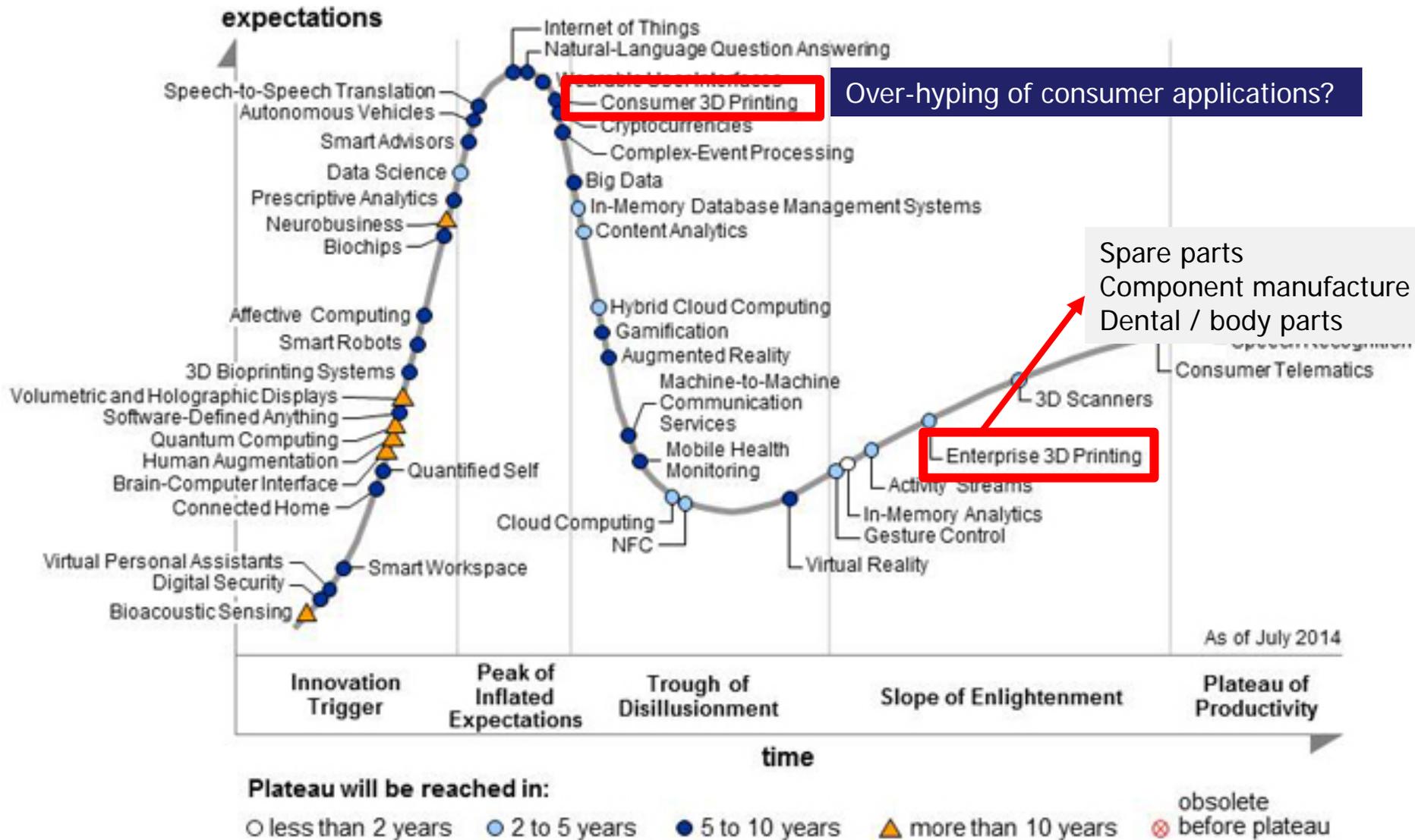
- Very expensive relative to scale economies of batch production
- Need to attach high value to customised products
- Technical difficulty in producing all but simple parts
- Limited range of materials used – constrains functionality
- Layering and bonding process causes intrinsic weakness

Home-made toys – *entry point for the domestic market?*

News > Technology > 3D printing

Hasbro aims to make 3D printing child's play

Position of 3D Printing on the Gartner 2014 Hype Cycle



Verdict on the 'game-changers'

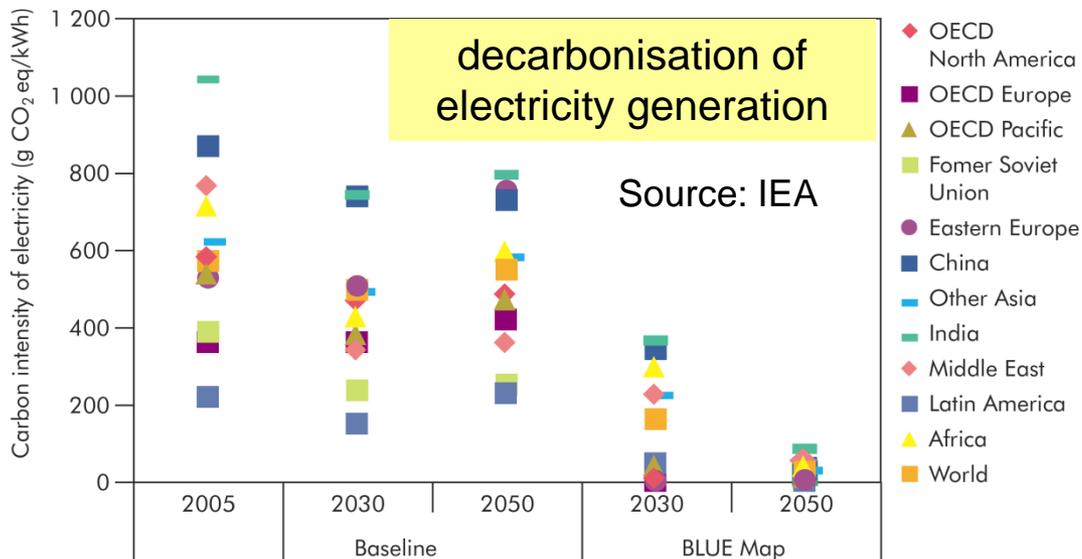
Drones – yet another curiosity

Crowdshipping / freight-passenger vehicle synergies: major opportunities if social attitudes, collaborative business models, IT systems and regulatory policy are well aligned.

Consumer-based 3D printing: potential for significant reduction in the amount of freight movement in urban areas – but scalability will be limited

Co-ordinated implementation of the much broader range of city logistics innovations will be required

+ real game-changers:

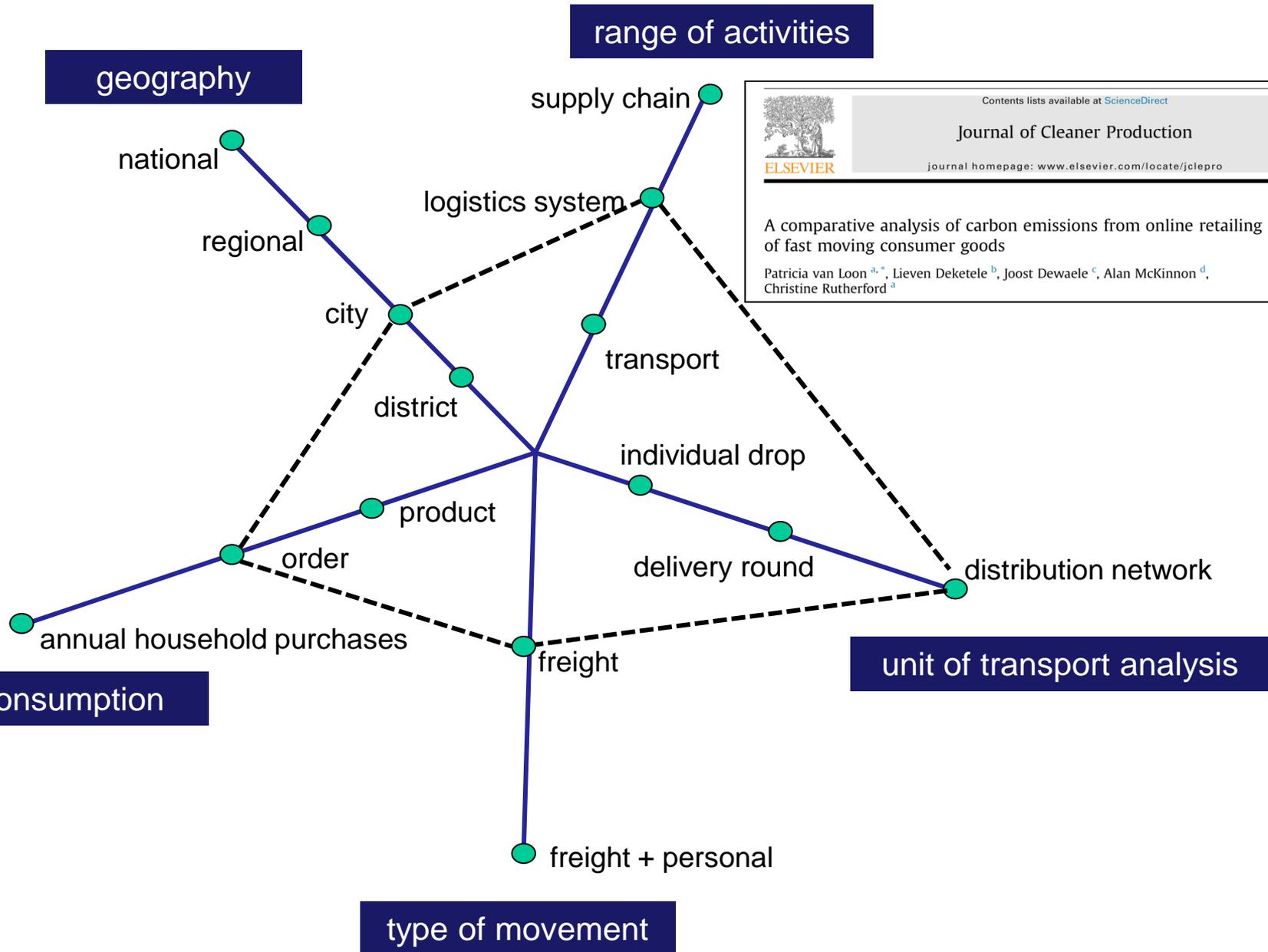


vehicle electrification



IT and software developments: *e.g. predictive analytics*

Carbon footprinting city logistics: *where do you draw the boundary*



Logistics of instant gratification

For online retailers, speed of delivery is a key competitive differentiator
Pursuit of cost-effective same-day delivery from any order point to any delivery point

Amazon DASH



Smart fridge



vendor management inventory (VMI) at consumer level on a JIT basis

potential explosion in number of home deliveries – *restrained by price mechanism?*

Patience is a virtue

Patience will be even more of a virtue in a low carbon world

Possible areas for transport research

Feasibility, scaleability and impact of individual city logistics innovations

Possible synergies between these innovations

Applicability of the innovations in different urban environments

Role of public bodies in incentivizing the uptake of innovations deemed to be beneficial in economic and environmental terms

Potential for modelling personal and freight flows in urban areas as an integrated 'fulfilment' system

Resolving methodological issues related to the carbon footprinting of city logistics and the setting of meaningful targets

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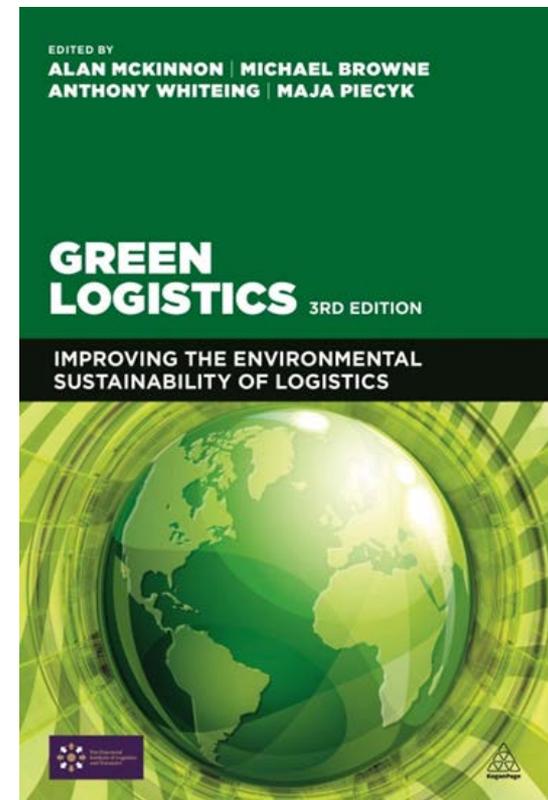
Kühne Logistics University – the KLU
Wissenschaftliche Hochschule für Logistik und Unternehmensführung
Grosser Grasbrook 17
20457 Hamburg

tel.: +49 40 328707-271

fax: +49 40 328707-109

e-mail: Alan.McKinnon@the-klu.org

website: www.the-klu.org





'Oh by the way, two ping pong bats arrived by drone yesterday...why would your mother send those?'