German Environment Agency

Umwelt Bundesamt

Climate Action in Transport Conference

Urban Freight and Logistics: Driver of sustainable mobility in cities?

Tim Schubert
Section I 3.1
Environment and Transport

Structure

INTRODUCTION

HYPOTHESIS I Urban freight is efficient, but has a disproportionate impact on the environmental quality in cities.

HYPOTHESIS II Current trends will reshape urban freight, but also increase the amount of vehicles and goods on the streets.

HYPOTHESIS III Implementing new ideas can make urban freight more sustainable, but the legal and economic conditions must be favorable.

UPSHOT

German Environment Agency

Central environmental authority in Germany

Subordinated agency of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

Topics (selection):

- Climate protection and adaptation
- Clean air, water and soil
- Waste avoidance and eco-design
- Chemicals and pesticide approvals

Introduction

"The delivery of consumer goods (not only by retail, but also by other sectors such as manufacturing) in city and suburban areas, including the reverse flow of used goods in terms of clean waste." (OECD 2003)

Sources: By Kora27 – Own Work, CC-BY-SA 4.0; Norbert Schnitzler – Own Work, CC BY-SA 3.0; Groupe NOVEA - Own work, CC BY-SA 3.0; Rudolf Stricker - Own work (own photo), CC BY-SA 3.0; Walmart from Bentonville, USA - Walmart's Aerodynamic Trucks, CC BY 2.0

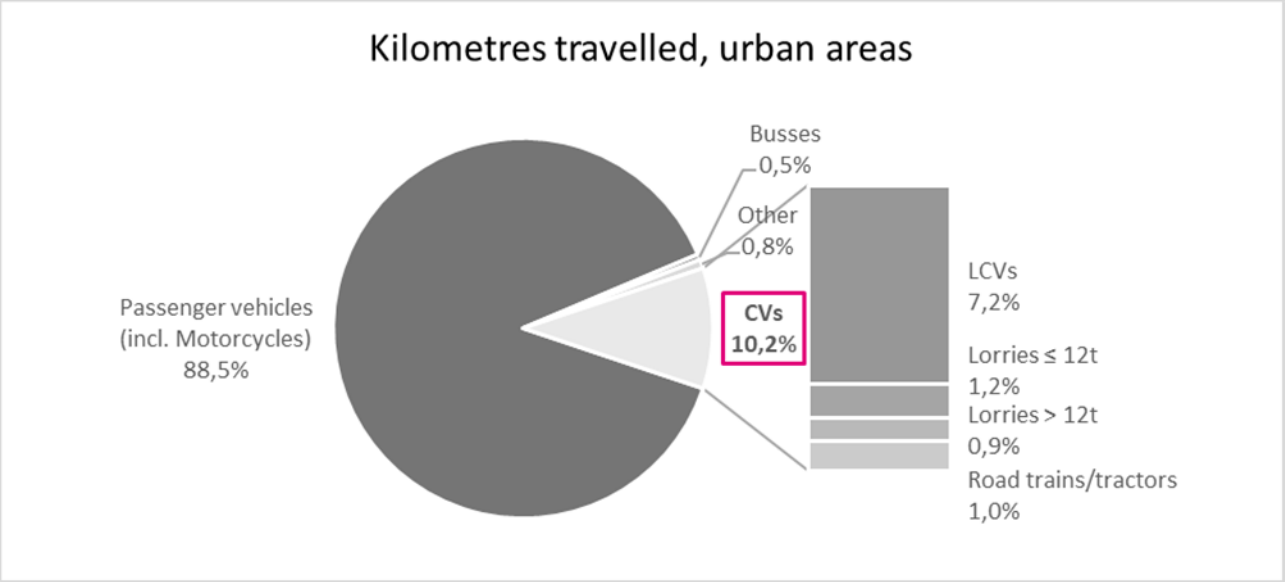
Hypothesis I: Environmental Impact

Urban freight is efficient, but has a disproportionate impact on the environmental quality in cities.

Source: schaltwerk / Fotolia.com

Environmental impact of urban freight transport in Germany

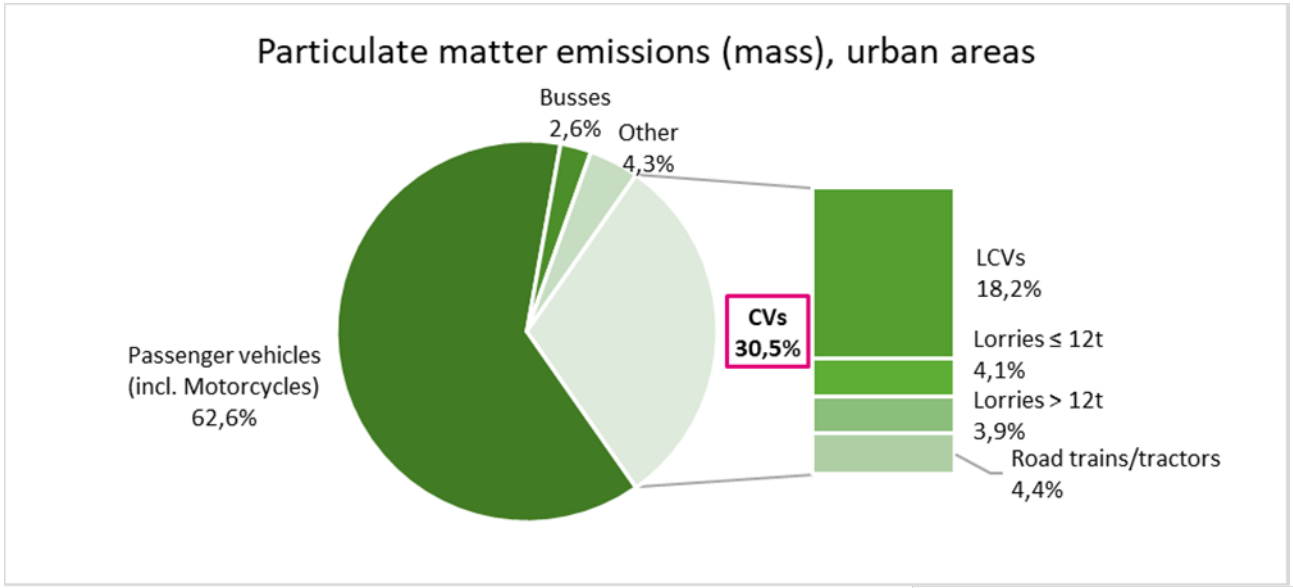
WHAT IS THE SHARE OF FREIGHT TRANSPORT IN BUILT-UP AREAS?



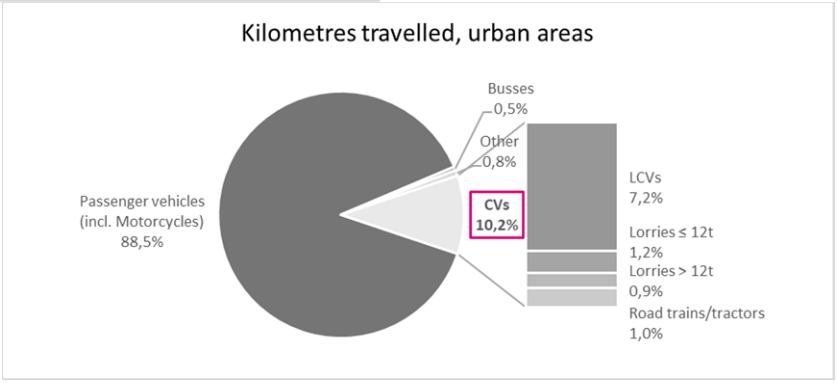
Data for 2016, Source: TREMOD 5.71 (09/2017)

Environmental impact of urban freight transport in Germany

PARTICULATE MATTER (MASS)



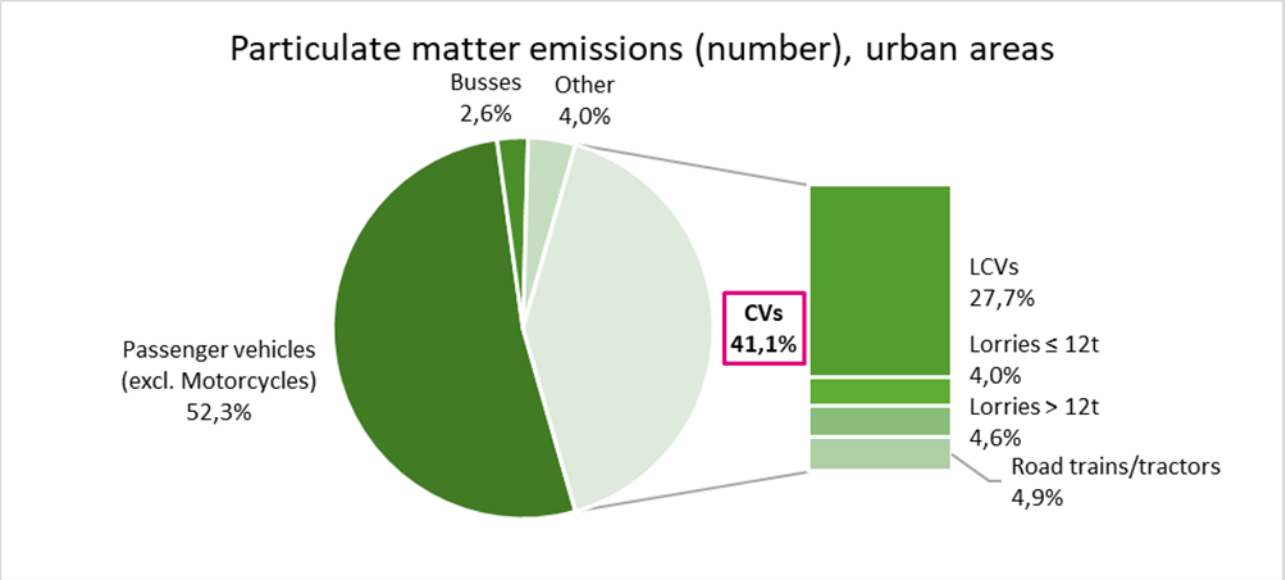
➔ Commercial vehicles are responsible for a disproportionately high share of particulate matter emissions from transport in cities.



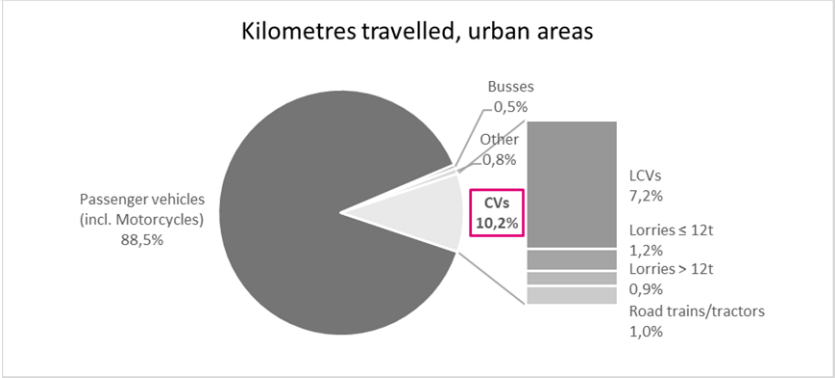
Data for 2016, Source: TREMOD 5.71 (09/2017)

Environmental impact of urban freight transport in Germany

PARTICULATE MATTER (NUMBER)



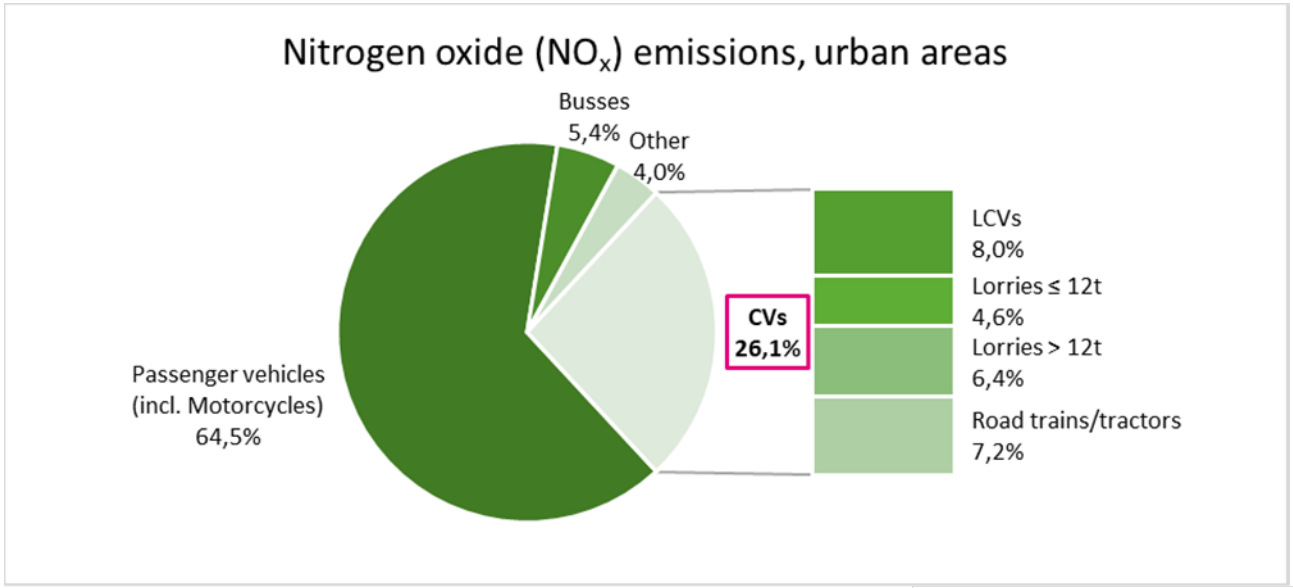
➔ Commercial vehicles are responsible for a disproportionately high share of particulate matter count, which indicates a high amout of harmful fine and ultrafine particulate matter ($PM_{2.5}$).



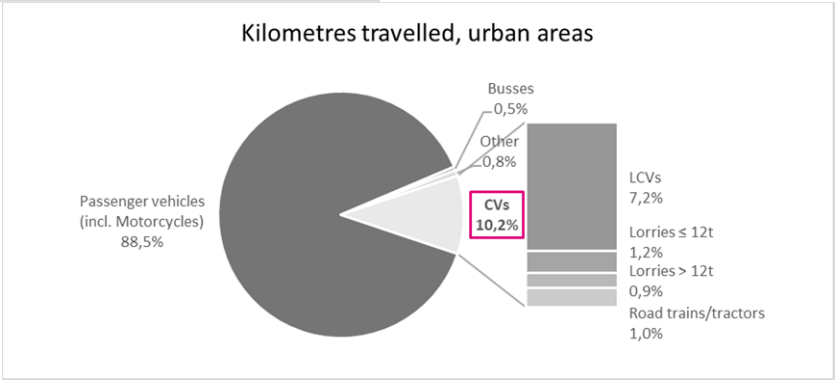
Data for 2016, Source: TREMOD 5.71 (09/2017)

Environmental impact of urban freight transport in Germany

NITROGEN OXIDES (NO_X)



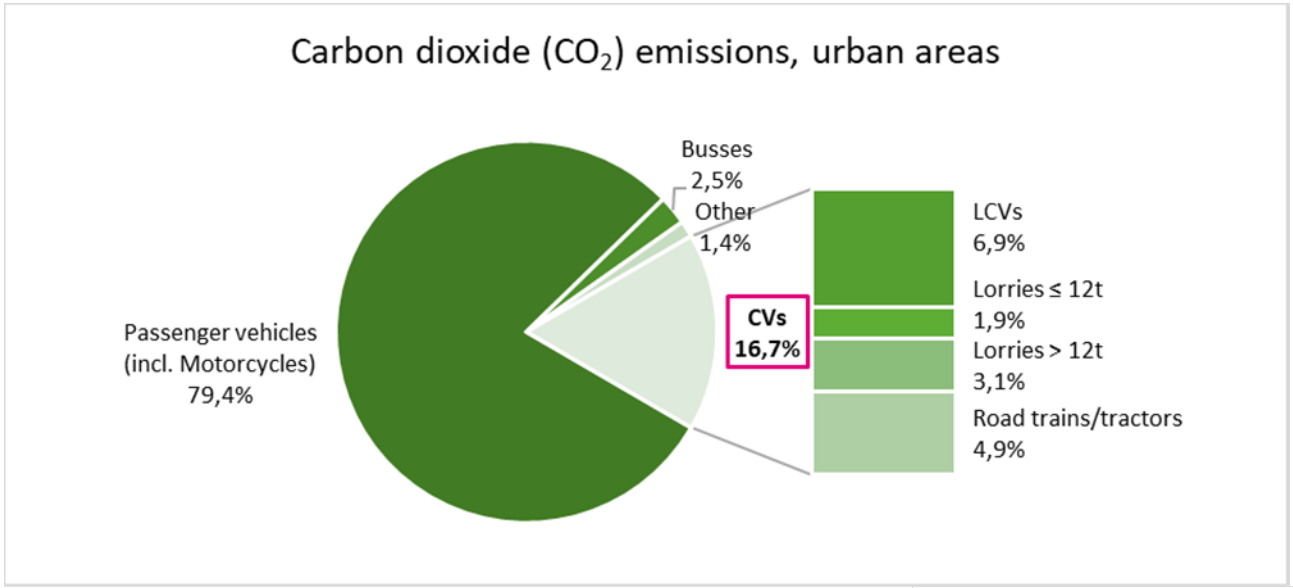
➔ Commercial vehicles are responsible for a disproportionately high share of nitrogen oxide emissions in cities, but it is already decreasing in relative and absolute terms.



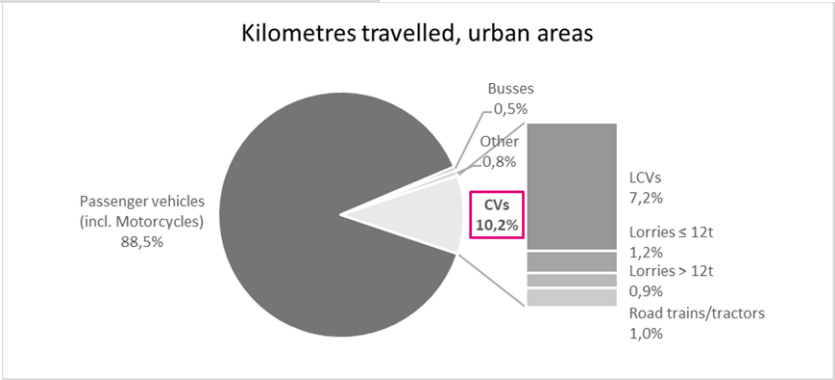
Data for 2016, Source: TREMOD 5.71 (09/2017)

Environmental impact of urban freight transport in Germany

CARBON DIOXIDE (CO_2)



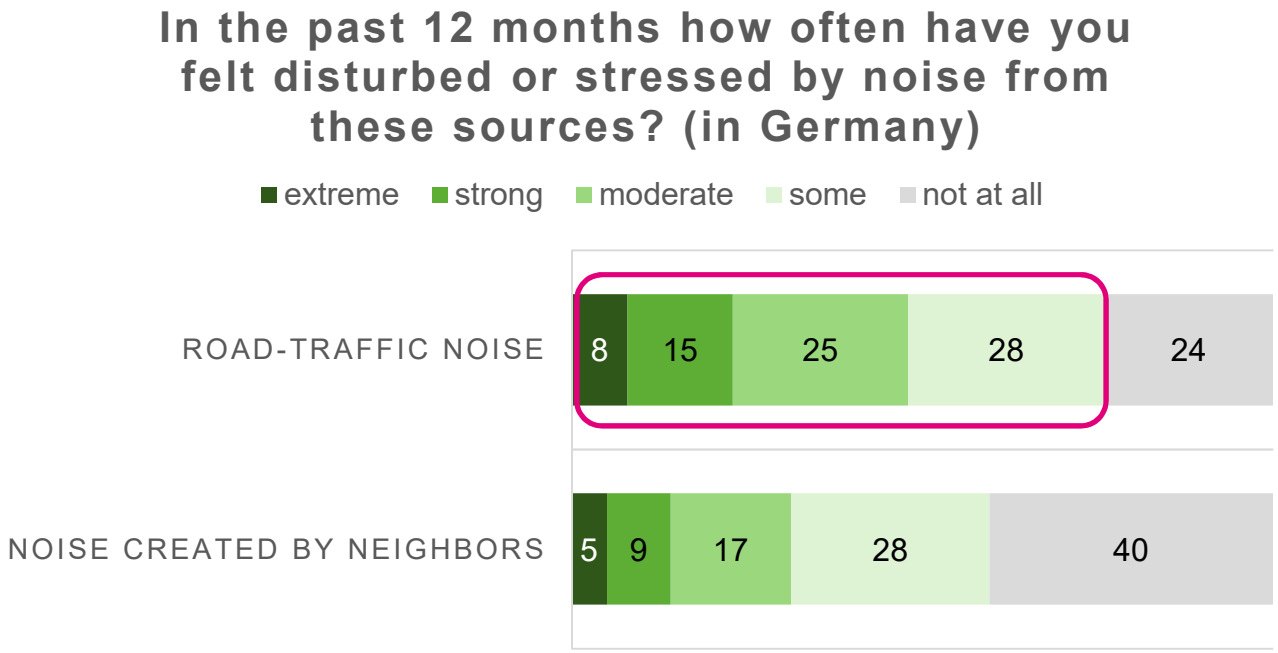
➔ Commercial vehicles must contribute to the goal of greenhouse gas neutrality by the middle of the century according to Germany‘s Climate Action Plan 2050.



Data for 2016, Source: TREMOD 5.71 (09/2017)

Environmental impact of urban freight transport in Germany

NOISE



➔ 76% say that they have felt disturbed or stressed by road-traffic noise in the past year.

➔ At 50 kph on a major road, an HGV is 6 to 10 times as loud as a car.

Source: Umweltbewusstsein 2016 / Umweltbundesamt

Hypothesis II

Current trends will reshape urban freight, but also increase the amount of vehicles and goods on the streets.

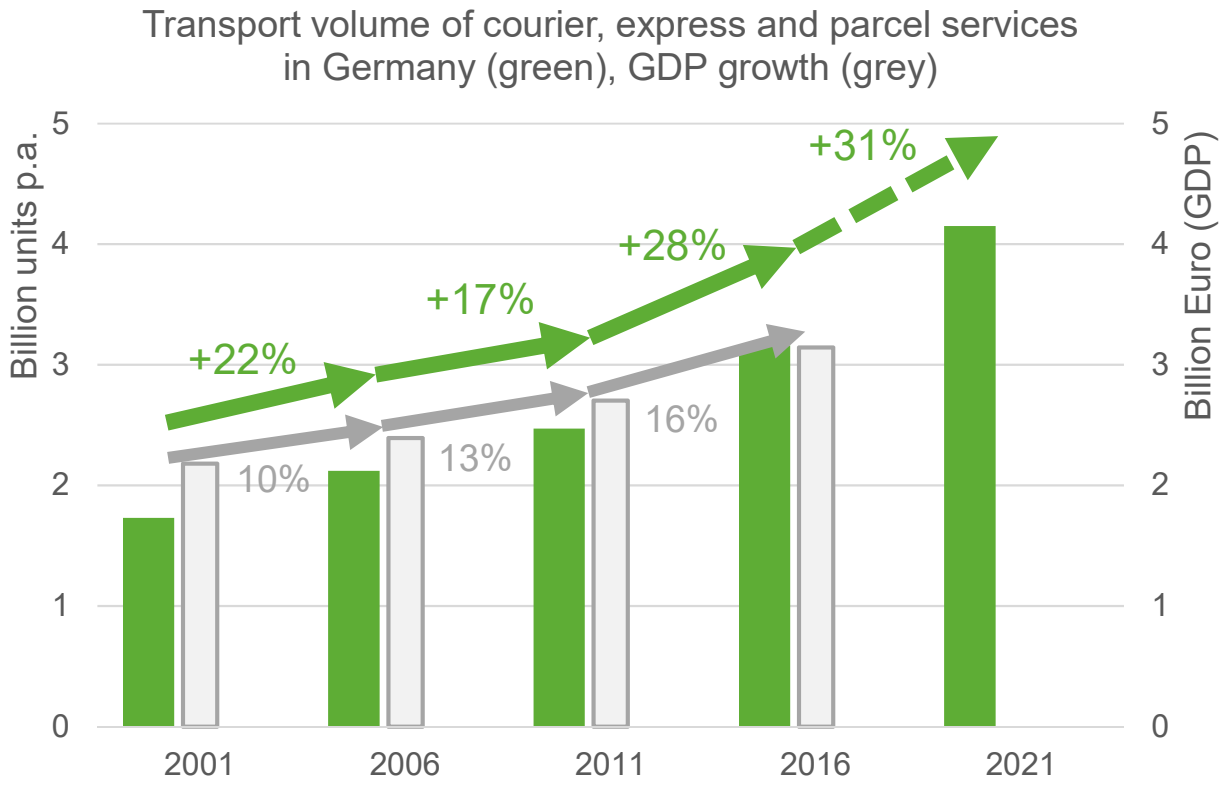
Source: Kara / Fotolia.com

Trends affecting urban freight (selection)

Sources: By SounderBruce - Own work, CC BY-SA 2.0; Superbass - Own work, CC BY-SA 4.0; Eduardofamendes - Own work, CC BY-SA 4.0; Scott Lewis - own Work, CC BY 2.0; Louise.ward - Own work, CC BY-SA 4.0

Growing number of shipments by courier, express and parcel services

CHANGES IN CONSUMER BEHAVIOR: E-COMMERCE



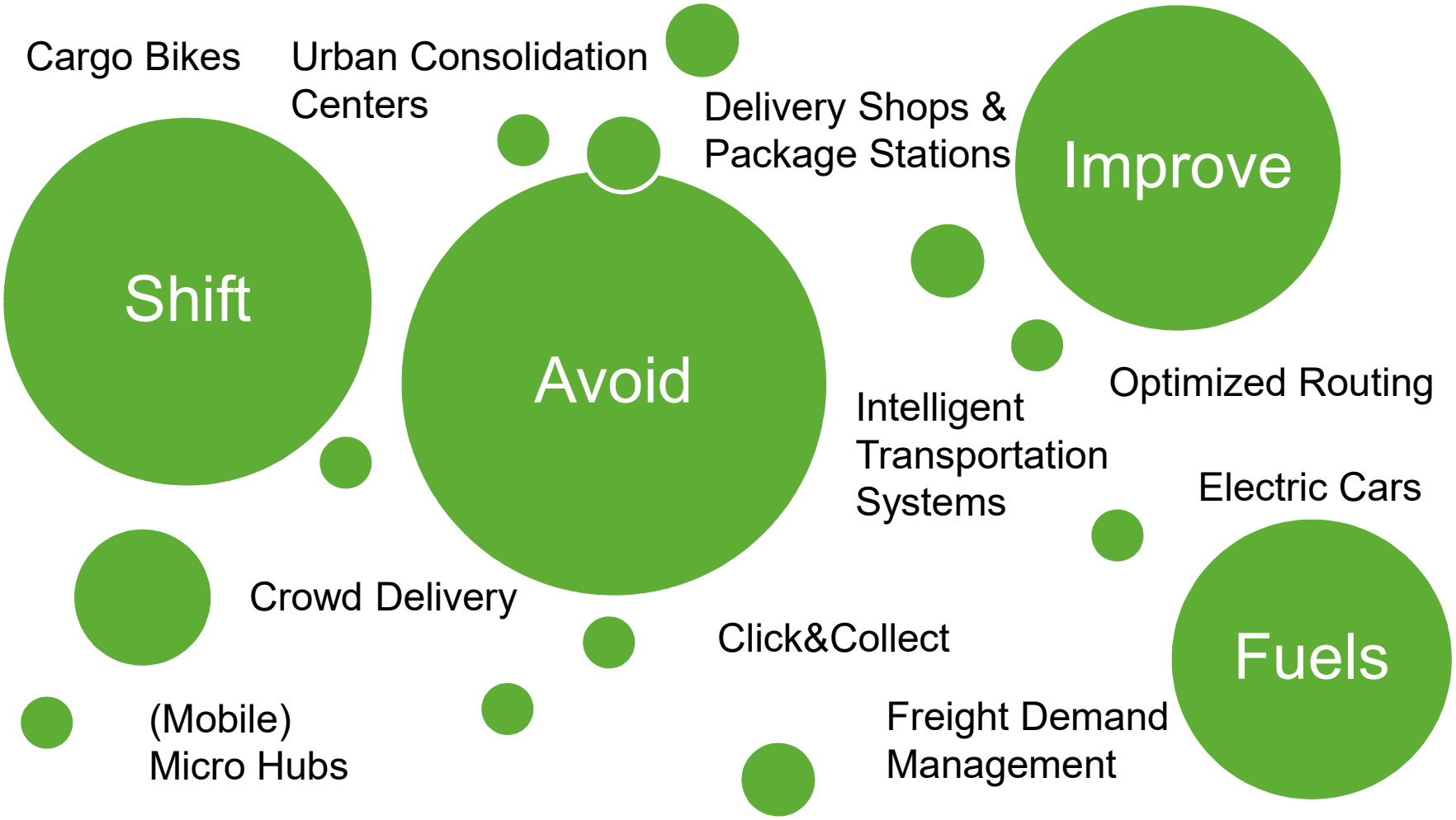
Source: Own work, Data: BIEK (2017) KEP-Studie 2017

Hypothesis III

Implementing new ideas can make urban freight more sustainable, but the legal and economic conditions must be favorable.

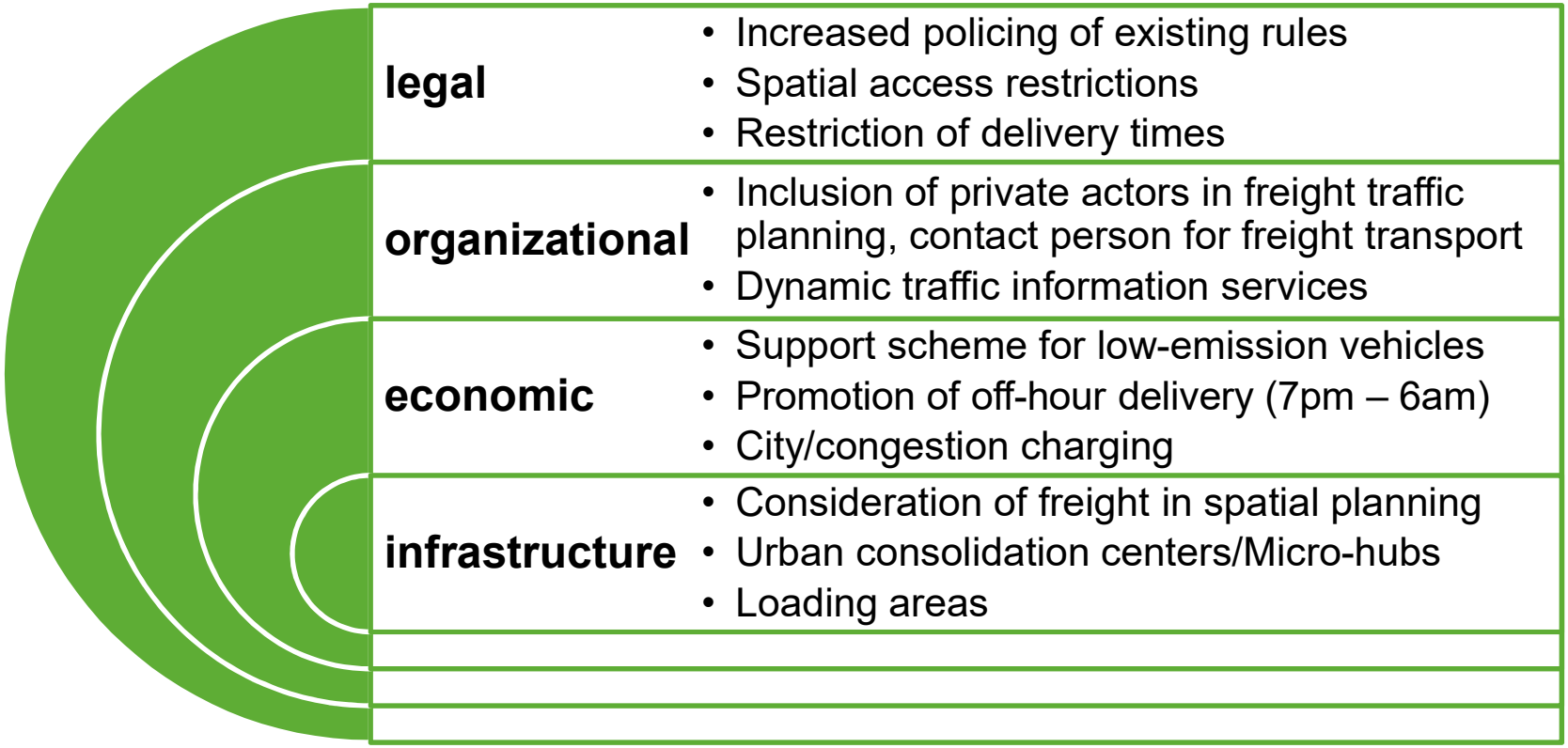
Source: Amac Garbe / DLR

(Old) and New Ideas



Policy approaches to promote sustainable urban logistics

WHAT MEASURES HAVE ALREADY BEEN IMPLEMENTED TO IMPROVE URBAN FREIGHT? (EXAMPLES)



But: Experience from pilot projects shows: Incentives alone are not sufficient and regulatory intervention is often necessary.

Policy approaches to promote sustainable urban logistics

WHY DID THE PILOT PROJECTS IN EUROPE DURING THE 1990S/2000S FAIL? (EXAMPLES)

By Schaarschmidt (2011), Müller-Steinfahrt (2016)

Lack of willingness to participate (retail companies)
- Less affected by problems, benefits not obvious

➔ **Policies need to**
(1) promote cooperation by focusing on receivers, too, and
(2) improve economic viability by changing the calculation,
i.e. balance the additional cost through incentives and regulation

Level of service not guaranteed
- Consolidated delivery leads to bottleneck at the recipient, insufficient shipment data transmission

Lack of interest at the local government level
- Change in local politics, low priority, lack of resources, lack of initial funding

Good practice in Germany, Denmark and the United States

URBAN DISTRIBUTION CENTERS AND E-TRUCKS

Aim: Avoid by consolidation

Where: Copenhagen

Source: © citylogistik-kbh.dk

Good practice in Germany, Denmark and the United States

URBAN DISTRIBUTION CENTERS AND E-TRUCKS

E-CARGO BIKE COURIER

Aim: Shift

Where: 8 cities in Germany

Source: Amac Garbe / DLR

Good practice in Germany, Denmark and the United States

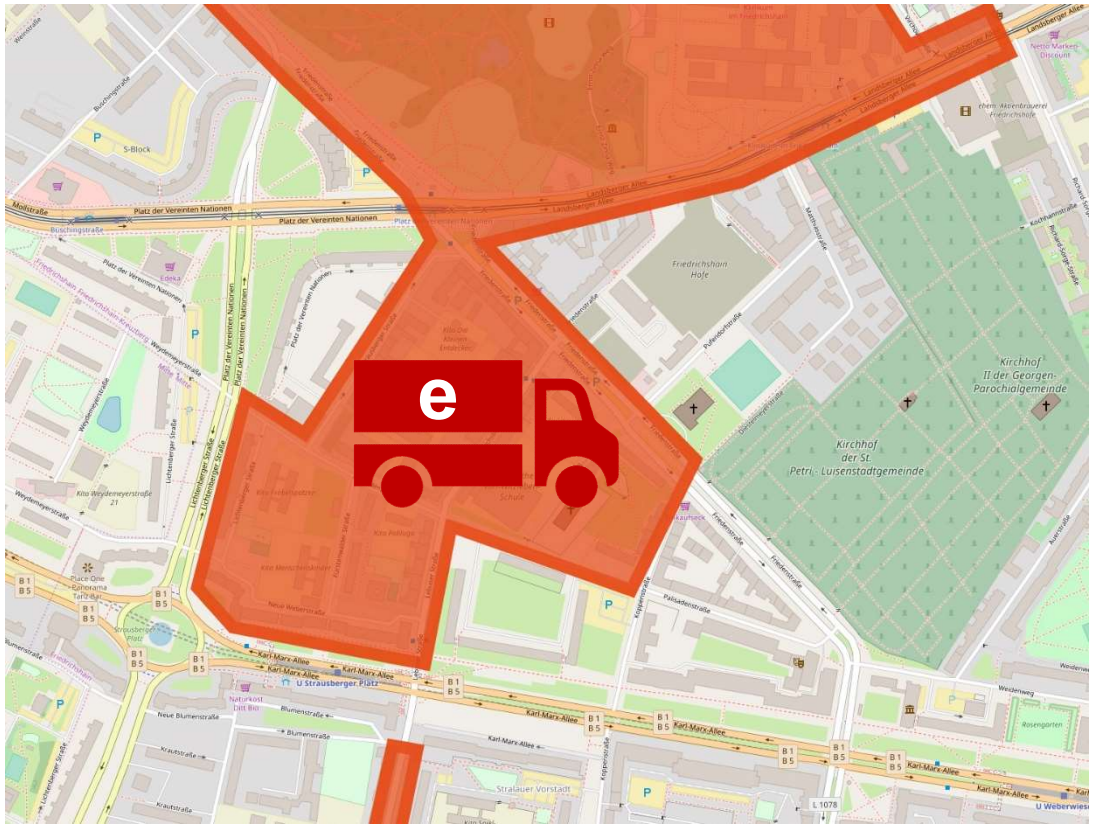
URBAN DISTRIBUTION CENTERS AND E-TRUCKS

E-CARGO BIKE COURIER

SMART ROUTING WITH GEO-FENCING

Aim: Improve

Where: Berlin



Source: Own work, © OpenStreetMap contributors

Good practice in Germany, Denmark and the United States

URBAN DISTRIBUTION CENTERS AND E-TRUCKS

E-CARGO BIKE COURIER

SMART ROUTING WITH GEO-FENCING

MICRO-HUBS AND CARGO-BIKES
Aim: Avoid and Shift
Where: Hamburg (and other cities)

Source: © 2015 United Parcel Service of America, Inc.

Good practice in Germany, Denmark and the United States

URBAN DISTRIBUTION CENTERS AND E-TRUCKS

E-CARGO BIKE COURIER

SMART ROUTING WITH GEO-FENCING

MICRO-HUBS AND CARGO-BIKES

OFF-HOUR DELIVERY WITH INCENTIVES
Aim: Avoid and Improve
Where: New York City

Source: By Takashi Hososhima from Tokyo, Japan - Delivery service truck, CC BY-SA 2.0

The Upshot

HYPOTHESIS I: Urban freight is efficient, but has a disproportionate impact on the environmental quality in cities.

Cities and national governments need to act to make urban freight transport more sustainable.

HYPOTHESIS II: Current trends will reshape urban freight, but also increase the amount of vehicles and goods on the streets.

The growth of E-commerce and new business models increase the pressure to act now.

HYPOTHESIS III: Implementing new ideas can make urban freight more sustainable, but the legal and economic conditions must be favorable.

Adoption of new, sustainable concepts for urban freight must be accelerated by both incentives and regulation.

Thank you for your attention!

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www.uba.de/en/topics/transport-noise