Urban freight transport as part of transportation planning

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Volume of urban commercial transport

Trends with increasing commercial transport:
- Changed spatial demand
- New timely requirements on transport demand
- Increasing complexity for logistic services

Ø 1/3 of all transport in cities (tkm) [KiD 2010]

SHARE OF COMMERCIAL TRANSPORT?

- Main share of freight transport on roads
- Road transport has high amount of impacts

Delivered goods for distances covered – \( T = T(\text{dist})^2 \)

Example Italy 2010
Source: Marinov 2013
Increase of delivery based on online trade

Delivery situation before online trade increased

Increasing number of delivery services

- More CEP\(^1\) companies
- Cargo bike couriers
- Private take away/on-demand delivery (Postmates, Uber freight,…)
- ….

More and faster deliveries

- Amazon Prime Now 2h

Increasing CEP\(^1\) market (red line) \(\rightarrow\) more traffic

CEP market and the transport sectors in Germany

\(^1\) Courier, express, pac
Nitrogen oxide emission inner urban traffic

Source: Martyn Douglas 2016; Data for 2014, TREMOD 5.61 (09/2015)
Infrastructure costs = forgotten costs!

Modernity Change Infrastructure in Germany 1980 to 2007

Investment demand for German municipality road bridges 2013-2020: 1 bill. € per year!

Arndt 2013
http://www.difu.de/projekte/2012/ersatzneubau-kommunale-bruecken.html

Abrasion of roads

1 LKW (24 t) = 10.000 PKW (1,4 t)

Source: ProgTrans AG, Basel 2009, from: Ralf Pagenkopf, GF Straßen.NRW (Pres. at BPPP, July 2013)
Problems caused by urban commercial traffic

- Pollutant emissions
- Noise pollution
- Accident endangerment
- Infrastructure damage
- Impairments / barriers for the traffic flow
- High spatial use and separation effects
- Impairment of the townscape
- Road as economic surface:
  - Road as storage facility
  - Logistics nodes on the road
  - Dump road
    - (36% of the supply and pick up operation in the public street space)
Problems for the commercial transport

- Delivery problems by design of road side
- Public transport stops
- Parking lanes
- No loading and unloading possibilities for delivery vehicles
- Stops in second row
- Stops on the crossing, junction or traffic light areas as well as on sidewalks
- Structural restrictions in the street space
- Barriers by building sites in the road space
- High traffic volume during new building projects
- Logistics in the road space
- Conflicts with other road users
- ...
- ... many topics, many tasks...
Electric vehicles

- Electric vehicles = no local emissions, low noise
- Adapted electro delivery vans for serving in pedestrian zones, residential areas, narrow streets …
- But consider the cost for companies in the case they have to renew their whole fleets
- Low offer of heavy duty e-vehicle!
- Examples without subsidies in practice
  - Gnewt Cargo, London
  - Cargohopper, Amsterdam
  - BSS, Nijmegen
  - UPS, Hamburg
- Need of regulations of the municipality

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Modal shift

Shift from ... to ...
Lorries/Cars  Rail  Bikes  Walk

• ~50% of urban goods transport could be delivered by **cargo bike** [www.cyclelogistics.eu](http://www.cyclelogistics.eu)
• The use of cargo bikes is mostly a cost efficient solution

Success in Dresden

e-Golf production in the Gläsernen Manufaktur
Loading zone

- Commercial transport has a highly important service function for cities!
- Third highest position after emergency and public transport
- Reserved zone at road edges for delivery and pick-up of commercial goods

What’s needed?
- Installation of loading zone with clear signs
- Parking and stopping should be prohibited
- Controlling of parking and stopping - continuously!
- But a low cost solution

Sometimes fails sometimes successful
Truck Routing System

- Designated routes for trucks in specified streets to avoid HDV traffic in residential areas
- Combining with navigation based information for freight/logistics operators

**Source:** Stadt Dortmund, Stadtplanungs- und Bauordnungsamt and Stadt Hamm, Stadtplanungsamt - Verkehrsplanung

- **Control is need**
- See projects „SMARTFREIGHT“ and „GOFER“ as well
Suppliers try to bundle their deliveries
Intra-company and in networks
Inter-company as supplier or sender cooperation
First CL models in 1990’s failed due to the competition and high coordination demand which were setting barriers of cooperation for companies on the same level of the supply chain
Barriers decreasing since full digitalisation of the information flow of the supply change: City logistic 2.0
But transactions cost for the delivery companies
Municipalities have to set a supporting framework including restrictions to promote supplier cooperation
Cooperation during construction period – Exp. Berlin Potsdamer Platz

- Prognosis: 42,000 additional lorry km/day
- Due to the *bau-log* concept mileage reduced to 1,300 lorry km/day
- 80% railway & inland navigation
- Relieved the inner-city road network
- Avoided noise and pollution to residents
- Building project was completed half a year earlier
- Additional cost for *bau-log* reduced after three months

urban development contract → Successful in Berlin
Delivery goods

- 2 underground docking stations for goods delivery at road tunnel
- Provide 110 shops, 30 restaurants, 2 cinemas, hotels and offices
- Underground delivery stations in a determined logistic regiment
- Shippers could book time slots of 15 min at one of 15 ramps
- 170 to 180 lorries use this station each day from 5 a.m. until 9:30 p.m.

High investment costs: only a solution for inner city areas with a high lorry demand

Control?
Actions fields of municipalities to reduce traffic in delivery

- Promotion of low emission delivery vehicles and concepts, e.g. restricted areas as environmental zones
- Implementation or support of coordinated route navigation, e.g. using ITS systems to optimize the delivery tours and control
- Installation of loading zones for delivery vehicles, commercial transport is essential for a city and control
- Support of supplier cooperation (City-logistics 2.0)
- Support of receiver/consignee cooperation, e.g. platform (delivery ramp) sharing, common procurement
- Initiating consulting platforms for commercial transport problems
- Implementation of area concessions for delivery and control


Set of promotions, restrictions, and control
Integration in planning process, Specific stakeholders and arena

- Consider specific stakeholders and policy fields in UFT

- Integration in all steps of planning process is needed

- Integration in all plans and planning levels are needed: national, regional, local; informal (land-use plans, transport plans), and formal (detail plans,...)
Success factors for the implementation of measures

Factors of successful implementation of measures in UFT

1. **Pressure to act** must exist
2. Knowledge about stakeholder constellation and **stakeholder involvement**
3. **Cooperation** by using discussion groups/round tables etc.
4. **Definition of common goals**
5. **Problem analysis**
6. **Step-by-step implementation** of measures, at first the most promising ones
7. Don’t hesitate to implement **restrictions and benefits** for environmental friendly uses/user
8. **Continuously monitoring** (control of success)
9. Information and **public relation** (use the media as an ally)
10. **Dissemination**: Replication, perpetuation, integration in a comprehensive concept
11. **Realistic expectations** about the opportunities and impacts

**SULP**? Or part of **SUMP**? It depends…

VCD 2006, revised
Legal framework of implementation

1. **Justification link**
   ▲ List of the urban quality goals and necessary measures intended
   ▲ Representation of the connection between the quality goals and the planned measures

2. **Integration in urban development concept**
   ▲ Concept should contain:
     • Temporal and local realisation steps
     • Impact assessment of the measures
     • Catering legitimate interests of parties concerned (residents, local enterprises)
     • At first implementation of measures with high probability of success

3. **Decision of the city council**
   ▲ Positive decision of the responsible committee regarding the concept

Courageous municipalities are needed!

Arndt, Sommer 1998
Abbreviations

UFT = Urban Freight Transport
CT = Commercial Transport
CL = City Logistics
CEP = Courier, Express, Package Services
HDV = Heavy Duty Vehicles
Sources


PWC 2017: Aufbruch auf der letzten Meile – Neue Wege für die städtische Logistik, pwc Deutschland 2017, https://www.pwc.de

Bentobox: http://www.bentobox-berlin.de/citylog-projekt/


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