Efficient transport logistics for a green future

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Workshop on Smart Urban Transport Policy Futures with a focus on Electric Vehicles

Greenwich

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Logistics has to make a substantial contribution to a positive development of the present societal challenges.

- Growth in consumption of raw materials
- Limited ecosystem capacity
- Urbanization
- Demographic change
- Increasing security demands
- Diversified consumption behavior
- Various leisure activities

- Protecting the environment and preserving resources
- Environmentally and resource saving logistics
- Securing the supply of urban systems
- Robust and secure logistics solutions for conurbations
- Preserving individuality
- Individual mobility and supply of goods and services

Logistics - an issue of key importance
Ruhr Metropolis

- Europe’s third-largest urban centre after London and Paris
- Turntable for the national and european traffic
- 5,700 logistics firms along the entire value chain
- 160,000 employed in the logistics sector and logistics-related industry
- Rapid growth of logistics sector

As one of Europe’s leading logistics locations the Ruhr Metropolis develops, implements and exports logistics solutions to meet the social requirements.
Commercial Transport

- **Commercial transport comprises all economic based transports**
  - by the transport of **people** exercising their **profession** (business passenger transport)
  - transport of **goods** and commodities (freight transport)

- **Fastest growing sectors of transport**
  - Expected growth in and between cities

- **Conflict of interests between different groups**
  - Competitiveness and economic effect
  - Ensuring a supply
  - Basic requirement for the service sector
  - Negative effects on society and environment
Efficient transport logistics

Efforts and Potentials of E-Mobility

- Urban areas as a driver of sustainable developments
- Tomorrow’s logistics should protect the environment and guarantee supply
- Developing innovative technology solutions and effective supply processes

*The functioning of these solutions can only be ensured if further conditions are in place*

E-mobility offers the opportunity to develop sustainable transport solutions
Types of E-Mobility

- Offers many application possibilities
- Adaptable to operator requirements
- Different technology standards
Letter and parcel deliveries in urban areas

- Several pilot systems with battery powered delivery vehicles
- High technical demands
  - Many stops
  - Small quantities per order
  - Short distances to cover
- Global player involved such as
  - Deutsche Post, DHL
  - DPD
  - UPS
Practice Examples
E-Mobility for Transport Logistics

Deutsche Post E-Bikes

- Since 2000 used for letter-delivery
- One third of all bikes equipped with e-drive
- Average trips of 13 kilometers
- Huge amount of stops
- 50 kg max. load capacity

Source: Deutsche Post

Project "Ich ersetze ein Auto"

- 40 E-Bikes in use
- 100 kg load capacity
- 90 km range
- 18,000 milage p. a.
- 25 km/h max. speed

Source: http://www.ich-ersetze-ein-auto.de
Practice Examples
E-Mobility for Transport Logistics

Spare Parts Logistics: DHL and Renault

- Delivery of spare parts in various metropolitan regions in Europe, Asia and the USA
- Just-in-Time-Production
- Short distances to production centres

Source: DHL

eHighway

- Use of overhead power lines
- Power supply via:
  - Power lines
  - Diesel engine
- No influence on other road users

Source: Siemens

Source: Siemens
Inductive charging
- Power transfer using the electric induction
- Comfortable and easy to use
- Higher user acceptance

Redox-Flow-Electrode
- 2 fluids used for energy storage
- The idea behind the project: exchange of fluids for a fast pit-stop
Swap container for small volume commercial transport in City Logistics

- Exchange of traction batteries and transhipment together with cargo
- Range extended by battery changing process

Olaf Poenicke, Klaus Richter, Michael Schenk (Fraunhofer IFF)
Major Challenges

- Diversity
- User acceptance
- Life span
- Disposal
- Technology
- Service station network

And many more…
Scientific perspective

- Investigating potentials, issues as well as measures in planning, implementing and monitoring process
- Recommendation for suitable and efficient e-mobility concepts
Necessity of approaches integrated in commercial transport modelling

- Steering and controlling of relations between society, environmental system as well as business and logistics processes
- Prerequisite for decision-making processes
- Advising stakeholders in spatial and transport planning, business and logistics sector

Source: Own Diagram
Benefits on transport modelling

- There is a need of generally valid instruments for transport policy
- Assessing impacts expected of measures and e-mobility by transport models
- Essential contribution to processes in transport and urban planning
Benefits on transport modelling

- Discussing potentials, perspectives and issues of innovative e-mobility concepts in a discursive way
- Considering the different perspectives of the specified systems
- Identifying strategies to improve the system
- Beneficiaries are the ecological system, business sector and society
Efforts on expert systems for decision-making processes

- Combining methods
- Considering logistics aspects and strategies
- There is a need to work on interdisciplinary approaches reflecting:
  - Relationships between the dependent systems
  - Conflict potentials
  - Ways to solve the future challenges
- Integrating individual, public and freight transport in one model to investigate the interactions and linkages
Efforts on expert systems for decision-making processes

- Collecting knowhow of individual, public and freight transportation research and practice
  - Focussing on multidimensional transport models
  - For developing coordinated infrastructure and strategies
- Illustrating the behaviour of the players in these models
- Assessing modifications of the cityscape and the urban infrastructure by analysis and forecasts
- Identifying requirements and expected impacts on the transport infrastructure
Transport models can identify new possibilities

- Reducing transport induced emissions in urban areas
- Bundling commercial transport in agglomerations by introducing innovative e-mobility solutions
- Optimizing transport and goods flows / reducing trips
- Managing the combined individual, public and freight transportation
- Adapting the e-mobility requirements on current infrastructure
- Implementing charging stations for e-mobility vehicles in the current system

- **Focussed influencing mobility behaviour by using the chances of new technologies**
Outlook

- Commercial transport has to play an important role in political and economic decision-making processes.
- The scientific goal must be to create models which enable realistic illustrations of the transport system and mobility behaviour.

The future will change for all participants in the urban transport system in an ecological, economic and social manner!
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