Urban freight data and quantified impacts of projects in Europe

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Translating facts into vision
Contents

- Introduction
- Urban freight data
- Quantified impacts of projects
- Prospects for the future
- Conclusions and recommendations
Introduction

Background: quantitative information on urban freight transport is not easily available.

Problems known in advance:
- Availability of data and evaluations
- Quality of data and evaluations
- Limited comparability (different objectives, survey areas, methodologies, indicators...)
- Some data not publicly available
- Unclear what the “right” indicators are
- Freight still unknown by some decision makers
However, figures can be powerful persuasion tools – the key to raising awareness. And it becomes more and more important to take action!

Therefore the BESTUFS team has developed two reports aiming to provide useful, inspiring information for anyone interested in urban freight transport data and quantified impacts of urban freight projects in Europe.
Methodology

- Identification of existing material
- Data gathering: partners helped to collect data and examples
- Reporting
- Validation of both report by experts in two dedicated meetings
The first report, “Quantification of Urban Freight Transport Effects I” (2006) provides information from surveys and statistics on:

- Freight volumes and commodities in urban areas
- Urban freight transport fleet
- Urban deliveries
- Economy
- Environment
- Safety
Quantification of Urban Freight Transport Effects I

Table 3-4 Time of goods delivery in The Netherlands

<table>
<thead>
<tr>
<th>Time frame</th>
<th>Utrecht</th>
<th>Amsterdam</th>
<th>Rotterdam</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 to 12:00</td>
<td>77%</td>
<td>82%</td>
<td>80%</td>
</tr>
<tr>
<td>12:00 to 18:00</td>
<td>22%</td>
<td>7%</td>
<td>19%</td>
</tr>
<tr>
<td>18:00 to 23:00</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>23:00 to 7:00</td>
<td>0%</td>
<td>11%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 4-11 Mean number of weekly core goods deliveries by vehicle type

<table>
<thead>
<tr>
<th>Business type</th>
<th>Deliveries</th>
<th>Articulated</th>
<th>Rigid</th>
<th>Van</th>
<th>Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food retail</td>
<td>16.4</td>
<td>21.0%</td>
<td>55.8%</td>
<td>23.2%</td>
<td>-</td>
</tr>
<tr>
<td>Clothing retail</td>
<td>4.8</td>
<td>32.0%</td>
<td>42.0%</td>
<td>26.0%</td>
<td>-</td>
</tr>
<tr>
<td>Other retail</td>
<td>8.6</td>
<td>7.5%</td>
<td>38.4%</td>
<td>49.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Restaurant</td>
<td>3.0</td>
<td>57.1%</td>
<td>14.3%</td>
<td>14.3%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Public house</td>
<td>5.0</td>
<td>-</td>
<td>70.0%</td>
<td>30.0%</td>
<td>-</td>
</tr>
<tr>
<td>Hotel</td>
<td>24.5</td>
<td>-</td>
<td>100.0%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Banks</td>
<td>5.3</td>
<td>-</td>
<td>-</td>
<td>100.0%</td>
<td>-</td>
</tr>
<tr>
<td>Other Services</td>
<td>9.7</td>
<td>5.3%</td>
<td>21.2%</td>
<td>65.7%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Warehousing</td>
<td>36.8</td>
<td>21.8%</td>
<td>44.9%</td>
<td>33.3%</td>
<td>-</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>24.1</td>
<td>27.2%</td>
<td>34.3%</td>
<td>38.5%</td>
<td>-</td>
</tr>
<tr>
<td>Personal Services</td>
<td>2.3</td>
<td>-</td>
<td>25.0%</td>
<td>60.0%</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

Source: Effects of Freight Movements in Winchester

Source: Volvo truck corporation environmental affairs, June 2005
The second report, “Quantification of Urban Freight Transport Effects II” contains information on the impacts of urban freight measures and projects on:

- Economy
- Environment
- Social

(the three pillars of sustainability)
Impacts of measures

**Impacts**

**Economic**
- To city and citizens:
  - Product costs
  - City’s attractiveness
  - Delivery space
  - Employment
- To companies:
  - Congestion
  - Investment/operation/delivery costs
  - Vehicle fleet
  - Efficiency/productivity

**Environmental**
- To city and citizens:
  - Pollution
  - Noise
- To companies:
  - Environmental image

**Social**
- To city and citizens:
  - Quality of life
  - Health
  - Accidents
- To companies:
  - Working conditions

September 14, 2007
Often, cities implement different measures at the same time. Report presents examples as:

- Single measures: one implemented measure
- Multiple measures: (near) simultaneous implementation of several measures (e.g. Urban Distribution Centre + Low Traffic Zone + incentives)
Collected information

- Start date
- Current status
- Parties involved
- Description
- Measure’s objective
- Additional information (acceptance, success factors, etc.)

- Impacts:
  - Economic
  - Environmental
  - Social impact
Examples

- Packstation pick-up point
- PIEK: technology for quiet distribution
- Night distribution Barcelona
- Low emission zone Utrecht
- Heavy vehicle fee Switzerland
- CITYPORTO Padua
- Impacts of access restrictions
- Environmental zone Gothenburg
### Economy
- Low cost for cities, eventually infrastructure adjustments
- Better service availability for customers

### Environment
- Reduction of unnecessary trip in city centre: a study in Cologne 2006 (29 Stations installed) showed that 35,000 vehicle km can be saved annually
- Less pollution and energy consumption

### Social
- Customer satisfaction increasing
- Improved quality of life for citizens
PIEK: quiet distribution in evening and at night
Supermarket pilot 2007

Pilots in 2007 with evening distribution: results show large reduction in travel time, fuel consumption and emissions.

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tilburg - Eindhoven</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance:</td>
<td>35 km</td>
<td>35 km</td>
</tr>
<tr>
<td>Trip duration:</td>
<td>1:30</td>
<td>0:30</td>
</tr>
<tr>
<td>Yearly distance:</td>
<td>210.000 km</td>
<td>210.000 km</td>
</tr>
<tr>
<td>Type of vehicle:</td>
<td>Volvo FH400</td>
<td>Volvo FH400</td>
</tr>
<tr>
<td>Fuel usage:</td>
<td>43 litres</td>
<td>33 litres</td>
</tr>
<tr>
<td>CO2</td>
<td>244 ton</td>
<td>187 ton</td>
</tr>
<tr>
<td>HC</td>
<td>4 kg</td>
<td>4 kg</td>
</tr>
<tr>
<td>Nox</td>
<td>633 kg</td>
<td>486 kg</td>
</tr>
<tr>
<td>PM10</td>
<td>10 kg</td>
<td>7 kg</td>
</tr>
</tbody>
</table>
Barcelona night-time deliveries

| Economic impact(s): | - Return on investment: 3 years  
- 7 12T trucks during day time could be replaced by 2 40T trucks during the night  
- Additional labour cost (night-working bonus)  
- For 7 points delivered cost savings of about 6,000 € per month |
| Environmental impact(s): | Results of measurements of noise due to unloading activities.  
Inside buildings:  
- min value 23.5 dB(A) [+ 0.3 dB(A)]  
- max value 33.4 dB(A) [+- 0]  
On-street:  
- max value 52.2 dB(A) [+ 0.1 dB(A)] |
| Social impact(s): | - Drivers (and shop owners) need to work during night time  
- The reactions of the residents nearby the shops which are delivered during night time are very positive – no complaints occurred. |
Low emission zone Utrecht

Euro Emission Standard of trucks and lorries in environmental zone Utrecht
Figure 3: Development of driving performance in road freight transport

Heavy vehicle fee Switzerland
The financial self-sustainability is going to be achieved, facing the end of public granting after 2007.
The necessity of public grants (provided by Municipality, Province, Region and Chamber of Commerce) is decreasing year by year.
Impacts of restrictions on distribution costs estimated for food supply chain in NL

- Time windows: +63%
- Vehicle restrictions: +37%
### Environmental zone Gothenburg

![Environmental zone sign](image_url)

<table>
<thead>
<tr>
<th>Category</th>
<th>HC</th>
<th>CO</th>
<th>NOx</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miljövinst med miljözon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Buss</td>
<td>16.5</td>
<td>-8.4</td>
<td>-8.4</td>
<td>-36.1</td>
</tr>
<tr>
<td>Miljövinst med miljözon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tung Lastbil &lt; 16 ton</td>
<td>-46.1</td>
<td>-26.7</td>
<td>-20.7</td>
<td>-67.0</td>
</tr>
<tr>
<td>Miljövinst med miljözon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tung Lastbil &gt; 16 ton</td>
<td>-16.4</td>
<td>-2.9</td>
<td>-6.3</td>
<td>-26.9</td>
</tr>
<tr>
<td>Miljövinst med miljözon</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Totalt</td>
<td>-3.6</td>
<td>-6.1</td>
<td>-7.8</td>
<td>-33.2</td>
</tr>
</tbody>
</table>
## Cross comparison (extract)

<table>
<thead>
<tr>
<th>Single measures</th>
<th>Environmental Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pollution</td>
</tr>
<tr>
<td>LCCC, UK</td>
<td>↓ CO2 emissions: c. 75%</td>
</tr>
<tr>
<td>CityPLUS, IT</td>
<td>↓ (Less pollutant vehicles)</td>
</tr>
<tr>
<td>LogUrb, PT</td>
<td>↓ in mileage (280.5 km/week)</td>
</tr>
<tr>
<td>Packstation, DE</td>
<td>↓ 36 million kg CO2</td>
</tr>
<tr>
<td>PIEK, NL</td>
<td>↓ 60.000 kg PM10</td>
</tr>
<tr>
<td>Night Delivery, ES</td>
<td>↓ of 7 trucks (12T)</td>
</tr>
<tr>
<td>City Cargo (Tram), NL</td>
<td>↓ 61,27 Kt on CO2</td>
</tr>
<tr>
<td>BILK, HU</td>
<td>↓ 1.660.000 kg NOx</td>
</tr>
<tr>
<td>Route planning, HU</td>
<td>↓ 773 kg CO2/day</td>
</tr>
<tr>
<td>Trip Planning Program, DE</td>
<td>↓ 3 vehicles could be saved</td>
</tr>
<tr>
<td>London Congestion Charging, UK</td>
<td>↓ (reduction of vehicles: 19%)</td>
</tr>
<tr>
<td>Congestion Charging, SE</td>
<td>↓ (no change in # deliveries)</td>
</tr>
<tr>
<td></td>
<td>↑ Euro4/5: 11%</td>
</tr>
</tbody>
</table>
Prospects for the future

- Improvement of quality, comparability and availability of urban freight data and evaluations is needed to improve awareness and to make better decisions.
- People trade in privacy for value!
- Private traffic management centres because of lack of competence in cities?
- Huge potential for Gallileo?
  - Arrival forecasts of the trucks at destination
  - Anonymous information to traffic management
  - *Automated law enforcement*?
- European Observatory on Urban Mobility?
Two useful reports have been produced, but:

- There are big gaps in urban mobility statistics at the EU level, but also at the local level where freight flows are concerned.
- Regular freight surveys are rare and results are often very difficult to compare because of the different methodologies used.
- Monitoring of the effects of measures is also often quite insufficient and difficult to compare.
Cities should be encouraged to finance regular freight surveys, as most cities do for personal travel surveys.

Guidance on efficient and comparable data collection and monitoring could help cities.

Data collection pilots in cities in different countries could provide interesting comparisons.

The establishment of suitable performance measures and benchmarking would help cities to determine the most relevant fields of action and would deepen the understanding and monitoring of urban freight related measures.

Role of the Commission?
Acknowledgement

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- NEA, RAPP, Transman, PTV

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Thank you for your attention.