FUTURE DEVELOPMENTS IN CITY LOGISTICS AND THE ROLE OF PROCUREMENT

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Agenda

1 city logistics: introduction
2 challenges
3 annual outlook city logistics
4 trends and developments
5 procurement in city logistics
6 conclusion
1. City logistics: introduction

Scope

Urban freight transport, defined as all movements of goods into, out of, through or within the urban area, made by light or heavy vehicles, including:

- Delivery of goods (business and home);
- Service transport and construction- and demolition traffic;
- Shopping trips made by private households;
- Reverse logistics for waste removal and for returns management;
- Service vans for maintenance, supply and removal of parts.
1. City logistics: introduction

Reasons for managing city logistics the contribution to:

- Emissions
- Safety and liveability
- Congestion
- Local economy

necessary for a city to function as such

Example from ancient Rome (Lex Iulia Municipalis, 45BC)

City logistics is not a NEW phenomena, but changes over time

Changing context >> provides new opportunities, as well as new (ways to solve) problems
1. City logistics: introduction

**Characteristics**

- Urban freight as an important *traffic component* in cities (10 to 15% of vehicle equivalent miles);

- *Low load factors* for delivery vehicles in cities (e.g. 38% for vans in London);

- Urban freight service companies are generally *very small* (85% of short distance truck companies have fewer than five employees);

- Urban freight accounts for a significant part of ambient *noise*;

- Estimated 70 - 75% of first-time deliveries are successful for business-to-consumer in the urban environment

1. City logistics: introduction

Characteristics: contribution to emissions

- Personenvoertuigen: 88.2%
- CO$_2$: 50%
- NO$_x$: 18%
- PM10: 47%

- Bestelwagens: 9.9%
- CO$_2$: 16%
- NO$_x$: 25%
- PM10: 26%

- Vracht-wagens: 1.3%
- CO$_2$: 18%
- NO$_x$: 37%
- PM10: 13%

- Russeen: 0.6%
- CO$_2$: 16%
- NO$_x$: 20%
- PM10: 14%

TNO: Rotterdam City Centre, 2015
1. City logistics: introduction

(Urban freight) transport is a derived demand

- Someone ordering goods or services is at the start of (all) city logistics, e.g.:
  - e-commerce
  - (public) procurement

- Transport operators are good at providing a transport solution
2. City logistics: challenges

GHG emission reduction target

- The city logistics system faces serious challenges for the near future
  - Serious share in transport’s GHG emissions (3.6Mton ~ 1/3rd of freight transport’s footprint in the Netherlands)
  - The carbon productivity challenge

*Annual Outlook City Logistics, 2017*
2. City logistics: challenges

* Zero emission logistics in city centers

- The city logistics system faces serious challenges for the near future
  
  *Major contributor to local emissions (and GHG emissions) in city centres*

- No easy (technical) solution available on large scale
2. City logistics: challenges

*Diversity and inertia*

- The city logistics system faces serious challenges for the near future
  - *No single solution / no silver bullet*
  - *System is very divers and difficult to change*

For solutions (or better making changes in the system) -> think about:
- *drivers for change (developments)*
- *directions to reduce negative impacts*
2. City logistics: challenges

GHG emission reduction target

- City Logistics is defined as follows: ‘the last leg in a supply chain to a customer location in a city, or the first leg from a customer location in a city back into the supply chain’
2. City logistics: challenges

**CO₂ footprint per city logistics segment**

Estimated CO₂ emissions city logistics per segment in the Netherlands

- **Temperature controlled**
- **General cargo**
- **Waste collection**
- **Parcel and express mail**
- **Facility logistics**
- **Construction logistics**

- **Van (N1)**
- **Trucks (N2 en N3)**

Annual Outlook City Logistics, 2017
3. Annual Outlook City Logistics

- develops a set of feasible paths (reference view) to decarbonize specific city logistics segments
- not a prediction of the future, nor a prescription of actions and tasks
- goal is to provide a baseline which can be shared and debated and improved, to structure discussions among stakeholders
- backcasting from GHG target
- following existing primary external drivers

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www.topsectorlogistiek.nl/download-nu-outlook-city-logistics/
3. Annual Outlook City Logistics: example

- Decarbonizing is possible
- Simply replacing diesel vehicles by electric vehicles is very costly: other solution directions are required

*Example: decarbonization path for construction logistics*
4. Trends and developments

External drivers

- Long list of trends and developments
  - DESTEP (demographic, economic, social, technological, ecological and political developments)
  - Desk research, expert interviews, expert sessions and round table sessions

Main external drivers (trends and developments) changing the city logistics system:
  - More demanding customers
  - Increasing pressure for reduction of GHG emissions
  - Increased pressure for liveability of cities
  - Circular economy
  - Connecting the physical world
  - Physical internet and universal labelling
  - Robotization and automation
  - Vehicle drivetrain technology
  - Performance based regulation
4. Trends and developments

*Societal and political pressure*

- Increasing pressure for reduction of GHG emissions
- Increased pressure for liveability of cities
- Circular economy

www.world.intesasanpaolo.com/
4. Trends and developments
Changes due to information technology

- More demanding customer
  recent mobile IT developments allow for more customer intimacy

- Connecting the physical world
  IoT applications, transparency and vehicle-connections
4. Trends and developments

*Changes due to information technology*

- Physical Internet and universal labelling
  
  *easier connections between networks*
4. Trends and developments

*Changes due to technology*

- Robotization and automation
- Autonomous vehicle technology
- Automated warehouse
4. Trends and developments
Changes due to technology

› Vehicle drivetrain technology
› Improve ICEVs
› Electric vehicles
› BEV / PHEVs

Figures and analyses: TNO in FREVUE
4. Trends and developments

Required policy developments

- Towards performance based regulation
- Flexible and customizable regulation
- Differentiating for logistics activities and environmental performance
- Standard regimes, but local application of zones
5. Procurement in city logistics

*Trends and developments only enabling change…*

- Trends and developments show directions for changes in city logistics system

- Keep in mind the motive for (urban freight) transport: someone is ordering the goods or services

- Real changes start at procurement: the customer sets the conditions

- Deployment of solutions / new directions depend on the question if someone is serviced ‘better’
5. Procurement in city logistics

E-commerce and home deliveries

- Awareness raising at customers
- Currently no real incentive (or option) for customers to choose for a sustainable option
- New services required, scale is an issue
5. Procurement in city logistics

Public procurement

- Cities (local authorities) can do a lot to reduce negative impacts:
  - Regulate
  - Coordinate
  - Stimulate
  - Facilitate
  - Experiment

- Authorities usually have a big role as ‘freight attractor’ in cities (including construction orders and permissions)

- Public procurement typically represents 10-20% of GDP within EU member states, and the public sector is therefore a major market actor

- Procurement can be used as a strategic instrument for helping to meet specific policy goals of the organisation through its influence on supply chains, and not simply as an administrative function
5. Procurement in city logistics

*Gap between policy objectives and procurement*

Procurement as a strategic instrument and not as an administrative function, *but*:

- No (easy) insights in transport footprinting
- Transport is indirect procured
- Procurers have ‘other’ incentives
- Procurement is not always centrally
- Transport movement (people and goods) as part of the procured service

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**Diagram**

- **C1**: own transport fleet
- **C2**: purchased transport service
- **C3**: delivery of goods, works, services
5. Procurement in city logistics

What volume? Mapping the current state

There is no easy way to find the exact procured transport

- Spent based (invoices)
- Delivery Service Plans (DSP)

**Internal procurement:**
- System errors
- Dependent on category managers
- Procurer targets

**External suppliers:**
- Difficulty to reach critical group
- Key suppliers: talking; regular data supply
- Supplier surveys

### Supplier Survey

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you rank your relationship with your supplier?</td>
<td></td>
</tr>
<tr>
<td>How do you rank the team of members who helps you in your project analysis and support?</td>
<td></td>
</tr>
<tr>
<td>How well does it communicate all its plans and goals?</td>
<td></td>
</tr>
<tr>
<td>Analysis of the team member who is your source of contact to your supplier:</td>
<td></td>
</tr>
<tr>
<td>Does he responds on time, is he regular in the meetings, and productive?</td>
<td></td>
</tr>
<tr>
<td>Is he able to take decisions, create innovative solutions, and is capable to tackle any situations?</td>
<td></td>
</tr>
</tbody>
</table>
5. Procurement in city logistics
What volume? Mapping the current state

Example: primary results Rotterdam (Population: 638,221)
5. Procurement in city logistics
A Hub for The Hague

The 'Logistical Hub The Hague' project will carry out a research and pilot project to organize the logistics within the government more efficiently and sustainably. It is a trial - in collaboration with the municipality of The Hague - where government buildings in The Hague are supplied with their materials from a central distribution center. The goal is to reduce CO₂ emissions, a better accessible city center and a cost saving by organizing the logistics processes more efficiently.
5. Procurement in city logistics
A Hub for The Hague

Overzicht van kantoorpanden en aantal werkplekken

- Rijk (36)
- Bedrijven (23)
- ZBO (13)
- Den Haag (17)

gemiddeld kantoorpand: 730 werkplekken
5. Procurement in city logistics

A Hub for The Hague: facility flows per week (normalized to number of employees per building)

Facilitaire goederenstromen per week
[genormaliseerd naar het aantal medewerkers per pand]
5. Procurement in city logistics

A Hub for The Hague: estimates volume
Conclusion

- City logistics faces serious challenges,
  but there are also opportunities to deal with these challenges

- Existing trends and developments could lead to more sustainable city logistics organisation, however this does not occur automatically

- Sustainable procurement could contribute to changing the system to become more sustainable (more in the direction of the Physical Internet vision) (as could strict spatial and environmental regulations)
THANKS FOR YOUR ATTENTION

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For more information:
• Outlook City Logistics 2017 download via www.topsectorlogistiek.nl/download-nu-outlook-city-logistics/
• Quak, Kok and Den Boer 2018 The future of city logistics. City Logistics 1 (Taniguchi and Thomspon), p.125-146
• FREVUE Deliverable 3.2 Economics of EVs for City Logistics - Report download via www.frevue.eu/reports (on transition towards zero emission city logistics, TCO analyses and requirements for wide scale electrification)