Cleaner mobility solutions: “last mile delivery” in Europe

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Last Mile Freight Delivery: Use of Cleaner Mobility Vehicles
OUR TEAM
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Research areas

Last mile delivery, Freight Transport and Traffic simulation

Electric mobility monitoring and impacts, LCA Fleet impacts, Policy implications

Sustainable transports, Urban Mobility Management

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Introduction

What is the current situation?
European applications of EV on last mile delivery

Energy, emissions, traffic and system efficiency in urban centers are affected by

**Urban logistics (last mile delivery)**

Almost 100% of goods transport within cities is done by motorized vehicles
Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system

**Ten Goals** for a competitive and resource efficient transport system: benchmarks for achieving the **60% GHG emission reduction target**

**Goal #1**: Developing and deploying new and sustainable fuels and propulsion systems

Halve the use of ‘conventionally-fuelled’ cars in urban transport by 2030; phase them out in cities by 2050; achieve essentially **CO₂-free city logistics in major urban centres by 2030**.

Energy, emissions, traffic and system efficiency in urban centers are affected by

**Urban logistics (last mile delivery)**

Problems addressed by

• **Introduction of cleaner solutions**
• **Adoption of more flexible and smaller solutions**
• **Parking and delivery policies**
• Micro-platforms
• Others
European applications of EV on last mile delivery

Number of electric cars per 1000 passenger cars (2012)

Adapted from Weeda, M., P. Kroon and D. Appels (2012) Elektrisch vervoer in Nederland in internationaal perspectief, ECN/Angentschap NL, Petten
European applications of EV on last mile delivery

Number of electric goods vehicles per 1,000 freight vehicles (2012)

Adapted from Weeda, M., P. Kroon and D. Appels (2012) Elektrisch vervoer in Nederland in internationaal perspectief, ECN/Agentschap NL, Petten
European applications of EV on last mile delivery

EVs are starting to be available for last mile delivery
Energy, emissions, traffic and system efficiency in urban centers are affected by

**Urban logistics (last mile delivery)**

Light goods are often transported over very short distances by HDV. Every second trip in urban areas is shorter than 5 km and could easily be done by bike.

**Small sizing of vehicles** -> 25% potential of all trips that could be shifted from motorized vehicles towards cycling-related solutions.

- Less energy consumption and CO₂ emissions
- Reduction in congestion, noise levels and pollution
- Increase in space for citizens
- Increase in the quality of urban life.
What is being done in Europe?

EU projects involving urban freight delivery
The ELCIDIS project tested a better solution for urban logistics by:

- Organizing urban distribution using quiet and clean (hybrid) electric vehicles
- A more efficient organization of urban logistics by more efficient routing of the vehicles and the use of urban distribution centers (UDC).
European projects: CIVITAS

**CIVITAS**: 15 projects on urban mobility (2002-2016)

CIVITAS works on 9 areas but the area of urban freight logistics it encourages:
- The use of cleaner freight vehicles
- Solutions to better coordinate freight logistics

More efficient freight deliveries can reduce congestion, lower emissions and free up space for sustainable modes.

Compare measures:
European projects: BESTFACT

**BestFact:** Best Practice Factory for Freight Transport (2012-2015)

**Objective:** develop, disseminate and enhance the utilization of best practices and innovations in freight transport

Areas of action:
- **Urban Freight**
- **Green Logistics & Co-modality**
- **eFreight**
European projects: **Cyclelogistics**

**Cyclelogistics** - Moving Goods by Cycle (2011-2014)

11 countries

Objective: aims to reduce energy used in urban freight transport by replacing unnecessary motorized vehicles with cargo bikes for intra-urban delivery and goods transport in Europe

http://www.cyclelogistics.eu/
European projects: **Cyclelogistics**

**Cyclelogistics** - Moving Goods by Cycle (2011-2014)

- Focus Groups
- Living Laboratory
- Shop by bike
- Vrachtfiets
- Goods Delivery
- Consumer Tests
European projects: STRAIGHTSOL

City Logistics project

STRAIGHTSOL http://www.straightssol.eu/
Strategies and measures for smarter urban freight solutions (2012-2014)
E-Mobility NSR: North Sea Electric Mobility Network (2011-2014)

Objectives:

• Provide **state of the art information** which may help policy development in e-mobility in the NSR.
• Provide insight into the **gaps and needs in respect of infrastructure, logistics and preliminary standards** for multi charging techniques.
• **Long-term analysis** upon which regional and local governments as well as other relevant stakeholders in the NSR may engage on e-mobility.

www.e-mobility-nsr.eu
European projects: ENCLOSE

City Logistics project

ENCLOSE - ENergy efficiency in City LOgistics Services for small and mid-sized European Historic Towns (2012-2014)

www.enclose.eu

Start: May 2012
Duration: 30 months
Coordination: MemEx Srl, Livorno (Italia)
Consortium: 16 partners from 13 EU countries
European projects: ENCLOSE

City Logistics project

ENCLOSE - ENergy efficiency in City LOgistics Services for small and mid-sized European Historic Towns (2012-2014) Almada City

Survey
700 shops
+ 30 cardrivers
+ 20 logistic companies
European projects: FREVUE

City Logistics project

**FREVUE** Demonstration of *Urban Freight Electric Vehicles for Clean City Logistics* (March 2013 – 2017)

DG Research  FP7

http://frevue.eu/
European projects: DOROTHY


Regions: Tuscany, Comunidad Valenciana, Lisboa e Vale do Tejo Region, Oltenia Region

- Definition of a Joint Action Plan (JAP) for RTD and innovation in Regions
  - Identification of the innovation measures and assessing of technological, implementation and benefit framework
- Mentoring of new clusters and measures towards the implementation of the Joint Action Plan
What else is being done in Europe?

Practical Applications of \textit{EV} \& \textit{bikes} in Last mile delivery
European applications on last mile delivery

Analysis of case applications in:

- Denmark (10)
- Norway (2)
- Germany (9)
- UK (11)
- The Netherlands (13)
- Belgium (10)
- Sweden (3)

Considering:
- Status
- Number and type of vehicle
- Type of application
- Funding
- Impacts
- Operation

Main source of information: E-Mobility NSR Comparative Analysis of European Examples of Schemes for Freight Electric Vehicles Compilation report, TU Delft, HAW Hamburg, Lindholmen Science Park, Aalborg, Denmark
European applications on last mile delivery

**Austria**
- Window Cleaner (Vienna)
- Food Delivery (Graz)
- Advertisement distributors
- Mail services (Graz)
- Bike messengers (urgent orders)

**Bulgaria**
- Festivals
- High School Proms
- Putting up posters
- Courier
European applications on last mile delivery

**Denmark**
- All sorts of goods transport
- Street vendors (ice cream, coffee, pancakes, cocktails, snacks, soup, sandwiches, sushi)
- Deliveries (post; packages)
- Shopping; supermarkets
- People - parents transporting children to day care centres

**Italy**
- Private mail and small packages delivery
- Waste collection (re-launched by creation of pedestrian areas)
- Child/children
- Municipal police (pedestrian areas)
European applications on last mile delivery

Romania
☐ delivery of refreshments such as hot dogs & coffee
☐ waste paper collection
☐ advertising
☐ courier services

Safety/security is an issue

New York
☐ Mostly food delivery;
Temperature is an issue
What are we doing?
• 1881: first carrier cycle was used by the British Post Office
• A few decades later, many shopkeepers used this type of bike to make local deliveries of bread, meat, milk etc.
The past?

- Thomas Edison was about to invent the light bulb
- The Statue of Liberty was about to be made in France and shipped to New York
- The Eiffel Tower didn’t exist yet
The present

Various models, able to transport up to 500 kilograms, and varying in price from 800 to 6000 euros, can be found on the market.
What are the main barriers?
Main barriers (Europe)

- The biggest problem seems to be (mis)perception: safety, security and theft of both cycles and payload (source: Transport for London)

- Technology (availability, cost, reliability/trust,...)

- Diesel Culture

- And for bicycles / cargo bikes
  - Driver fatigue
  - Range (4 or 7 km)
  - Topography
  - Weather (seasonality)
How are we addressing the challenges?
Research questions

1) How does the use of CMS´s affects traffic, energy efficiency and emissions?

2) What should be the geographical coverage of CMS’s replacing conventional vehicles on city logistics?

3) What is the appropriate business model, the adequate incentives and policies?

4) How do these solutions behave in real world conditions?
Research questions

1) How does the use of CMS’s affects traffic, energy efficiency and emissions?
2) What should be the geographical coverage of CMS’s replacing diesel vans on city logistics?
3) What is the appropriate business model, the adequate incentives and policies?

Macro-simulation of traffic impacts of the introduction of small electric vehicles in Oporto
Research questions

4) How do these solutions behave in real world conditions?

On road monitoring of electric vehicles and electric bicycles (over 200km monitoring in Lisbon)

Dynamics, energy consumption of vehicle (and biker)