Challenges of first and last mile freight transport

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CONTENT

Facts and figures

Challenges
(operational and policy)

Solutions

Recommendations
In 2018, 4.2 billion people, 55 percent of the world’s population, lived in cities. By 2050, the urban population is expected to reach 6.5 billion.

Cities occupy just 3 percent of the Earth’s land but account for 60 to 80 percent of energy consumption and at least 70 percent of carbon emissions.

The economic role of cities is significant. They generate about 80 percent of the global GDP.

Transport is the second largest energy consuming sector, with 32% share of final energy consumption and 23% of CO2 emissions.

• **In just 20 years**, without appropriate actions, our cities will become much more congested, less safe, more polluted and in general increasingly complex in terms of liveability and mobility.

• **Continuous growth** of urban areas - increases the need for innovative and efficient logistics in cities.

• Last and first mile is of particular importance - need to **search for synergies between short and long-distance transport**
Operational challenges

- Lack of urban freight data (type of vehicle, number of shipments, frequency ?)
- Growth of e-commerce (large proportion return to sender – 70%)
- Increasing number (growth) of small packages (pull logistics principles)
- Same day, JIT and instant delivery (new standards, especially for food)
- Low utilisation rate of freight vehicles (20% empty trips, load factor only at 0,3)
- Not adequate logistics facilities in cities (transhipment points, loading bays ...)
- Traffic congestion, traffic safety (double parking, traffic emissions CO2 ...)
- Big share of own delivery (far from optimal, small quantities)

If we don’t have a good overview of logistics processes we are not able to manage them properly !
What about last mile?

The final journey in the supply chain. It is transport from logistics nodes to end users in the city.

Challenges:

- **Transhipment** from long distance trucks to short distance vehicles.
- Limited accessibility to customers in city centers (narrow streets)
- Traffic congestion (time consuming)

**Last mile** is considered the most expensive part of the supply chain - contributing as much as **28%** to the cost of transport.
Policy challenges

• EU transport policy goal:
  • essentially CO2-free city logistics in urban centres by 2030.

In practice, two different approaches:

• ACCESS RESTRICTIONS for freight vehicles in the city
  • freight transport is responsible for majority of traffic problems
  • it needs to be removed from the cities (especially city centre) ......

• IMPROVING ACCESSIBILITY conditions for freight vehicles
  • Efficient freight transport is crucial for functioning of the city,
  • the most effective solution needs to be found.
Solutions – best practices

URBAN CONSOLIDATION CENTRES (UCC)

London - a city consolidation center was introduced, which was available for the needs of construction logistics in the city.

The following benefits have been identified:

- **70-80% reduction in energy consumption** (and consequently CO2 emissions)
- **70% reduction** in the number of vehicles delivering to the construction site.
Solutions – best practices

MOBILE DEPOT

TNT introduced this measure in Brussels and achieved good results in reducing emissions.

In the pilot project, they achieved:

• **24% reduction in CO2 emissions**
• **22% reduction in PM10 particles**
• similar results are achieved also in Turin (Italy)
In Vienna, they have developed an intelligent system to optimize vehicle driving around the city. The pilot project achieved

• 60% savings in time,
• 15% savings in mileage,
• 20% savings in fuel and emissions, and
• 30% reduction in delivery costs to the city center.
The city of Barcelona implemented a project to promote night deliveries to major stores in the city:

- vehicles equipped with PIEK noise reduction technology (silent hydraulic system and low-noise tires).

During the pilot they managed to:

- reduce delivery times by 50%,
- fuel consumption by 57% and
- emissions by 53%.
In Rome, a computer simulation was carried out in which dynamic management and reservation of loading bays were envisaged. They found that such a concept could reduce:

- total delivery time by 66%.
- similar results achieved in Paris and Vienna.
In Turin, it was estimated that:

• CO2 emissions of \textbf{250 grams per kilometer} could be reduced by using a freight bicycle.

In a pilot project in London, the introduction of freight bicycles:

• reduced the total distance travelled by \textbf{14\%} and CO2 emissions per consignment by \textbf{55\%}.  

Solutions – best practices
E-DELIVERY CVEHICLES

In London, by replacing diesel lorries with electric and tricycles:

• the distance traveled from the consolidation center was reduced by 20%
• and CO2 emissions by 54%.

Solutions – best practices
Solutions – best practices

ROBOTIC AUTONOMOUS DELIVERY

Currently trials in California and Washington D.C.

The first results show that with a small fleet of robotic vehicles:

• the cost of the last mile can be reduced by up to 40%.
Solutions – best practices

There are also many other options:

- **Crowd sourcing** (wan sharing)
- **Delivery lockers**
- **Dron delivery**
- **Delivery to the trunk of a car**
- **Shared distribution centres among logistics operators**

Many innovative (mainly technology driven) approaches.
Reccomendations

• **Cities differ among each other** (size, density, type of commercial activities etc)
  
  • but are **facing similar urban freight problems** (accessibility, lack of loading bays, lack of coordination/collaboration etc.) and could therefore **learn from each other**.

• **If we want to solve problems**, we first need to **understand urban freight transport phenomena** (number of transport missions, freight quantity, type of vehicles, utilisation rates etc.)
  
  • this is **precondition for solving urban freight problems** in cities and **develop sustainable policies** and measures.
Reccomendations

• It is very difficult to assess the effects of particular measures in advance:
  • living lab approach is suggested with the help of evidence-based policy making,
  • this enables to gather the data and evaluate the results along implementation.

• Implementation requires involvement of different stakeholders’ (city authority, logistics operators, receivers):
  • establishment of freight quality partnership (FQP) is recommended which allows to co-create measures and helps to reach expectation of all different participants.
Reccomendations

• **Sustainable Urban Mobility Plans** (SUMP) which are adopted in many European cities are mainly dealing with transport of people:

  • there is a need to **raise awareness** of freight transport aspects and develop **Sustainable Urban Logistics Plans** (part of SUMP, annex to SUMP, standalone documents).
Thank you very much.

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