Practices in Freight Planning
Balancing Sustainability and Resiliency

Sustainable freight planning in France and Europe

Dr. Laetitia Dablanc
• Research oriented Chair
• Warehouses, innovations, new trends in consumption and impacts on city logistics

Results available online:
• Observatory of ecommerce mobilities
• Logistics real estate and relationships with urban form in 74 large cities around the world

European transport policy somewhat includes sustainable freight

- Integrated vision of transport, including freight (freight is included in the various topics of European Union transport policy)
- Key word is **internalizing external costs**: truck pricing principles for example are set at the EU level
- Strong focus on **investments in multimodal infrastructure**: « Achieving the ambitious climate goals also requires a shift to more sustainable transport modes such as rail and inland waterways. »
- Focus on « **interoperability** », technologies that can work from one country to another
- **EU Emissions Trading System** is going to integrate transport
- **Emission standards** for vehicle manufacturing
European Green Deal (2021) and various emissions standards

• EU's climate, energy, transport and taxation policies must be fit for **reducing net greenhouse gas emissions by at least 55% by 2030** compared to 1990 levels

• EU-wide **CO₂ emission standards for heavy-duty vehicles** adopted in 2019 setting targets for reducing average emissions of new lorries for 2025 and 2030

• **Definitions** setting
  - clean heavy-duty truck: hydrogen, battery electric (incl. plug-in hybrids), natural gas (CNG, LNG, incl. biomethane), liquid biofuels, synthetic and paraffinic fuels, LPG
  - Zero-emission heavy-duty trucks: no tailpipe CO₂ emissions

• Manufacturers must meet **targets for lorry fleet-wide average CO₂ emissions** of new lorries (compared with 2019-2020):
  - from 2025 onwards: 15% reduction
  - from 2030 onwards: 30% reduction
PM and NOx emission limits: Euro standards

Table 1
EU emission standards for heavy-duty CI (diesel) engines: Steady-state testing

<table>
<thead>
<tr>
<th>Stage</th>
<th>Date</th>
<th>Test</th>
<th>CO</th>
<th>HC</th>
<th>NOx</th>
<th>PM</th>
<th>PN</th>
<th>Smoke</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>g/kWh</td>
<td></td>
<td>1/kWh</td>
<td>1/m</td>
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<tr>
<td>Euro I</td>
<td>1992, ≤ 85 kW</td>
<td>ECE R-49</td>
<td>4.5</td>
<td>1.1</td>
<td>8.0</td>
<td>0.612</td>
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<tr>
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<td>1992, &gt; 85 kW</td>
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<td>4.5</td>
<td>1.1</td>
<td>8.0</td>
<td>0.36</td>
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<tr>
<td>Euro II</td>
<td>1996.10</td>
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<td>4.0</td>
<td>1.1</td>
<td>7.0</td>
<td>0.25</td>
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<tr>
<td></td>
<td>1998.10</td>
<td></td>
<td>4.0</td>
<td>1.1</td>
<td>7.0</td>
<td>0.15</td>
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<tr>
<td>Euro III</td>
<td>1999.10 EEV only</td>
<td>ESC &amp; ELR</td>
<td>1.5</td>
<td>0.25</td>
<td>2.0</td>
<td>0.02</td>
<td>0.15</td>
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<tr>
<td></td>
<td>2000.10</td>
<td></td>
<td>2.1</td>
<td>0.66</td>
<td>5.0</td>
<td>0.10a</td>
<td>0.8</td>
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<td>Euro IV</td>
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<td>0.02</td>
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<tr>
<td>Euro VI</td>
<td>2013.01</td>
<td>WHSC</td>
<td>1.5</td>
<td>0.13</td>
<td>0.40</td>
<td>0.01</td>
<td>8.0×10¹¹</td>
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</table>

a PM = 0.13 g/kWh for engines < 0.75 dm³ swept volume per cylinder and a rated power speed > 3000 min⁻¹

Euro VII is in the making, European Commission proposal should be announced in 2022
National level: various ways to set up a sustainable freight strategy, example of France

- National State and municipalities mostly, with various other authorities at a lesser extent (Regions)
- Freight operations can’t be subsidized except for (strictly) intermodal
- Freight investments:
  - rail freight infrastructure (new strategy 2021)
  - acquisition of clean veh. eg 2022: €150,000 per battery electric large truck
- Maximum gross weight of trucks set by the national level at 44 tons (very different in other European countries)
- Regions: set up regional master plans (guidelines) and by 2024 will decide on truck pricing regulation on major roads
- Cities:
  - Euro standards are used to define truck access bans in metropolitan areas
  - New zoning plans favor urban warehouses
2016 zoning ordinance of Paris: regulations incentivizing the implementation of logistics facilities

- Areas dedicated to large urban services
  - River banks
  - Rail areas
  - Hospitals or former hospitals
  - Other

- 61 location perimeters for logistics activities
Chapelle logistics hotel (45,000 sq m)

- Recycling of a former freight rail area
- Four levels
- Multi-use: logistics, offices, data center, sports, urban farm
- Rail infrastructure (unused yet)
Chapelle logistics hotel
Logistics facility from the recycling of a gas station (project)
Low Emission Zones: targets by municipalities with a strong push from the national government

• In 2025 all 40 largest metro areas in France will have to implement a Low Emission Zone banning trucks older than 2014 and vans older than 2011
• France is shy in terms of LEZ number, standards, enforcement
• End of diesel: 2024 Paris, 2025: Grenoble, 2026: Lyon, 2028: Strasbourg
• End of ICE cars and vans 2035 in the country
• End of ICE trucks 2040 in the country
Freight forums (consultation) and freight data collection

- All major cities are engaged in freight partnerships with the industry representatives
- From specific freight surveys to new methods to collect data
  - Big data from ANPR cameras (automated number plate recognition)
  - Data sharing with freight operators
- Data serve freight modelling and carbon footprint assessments
Zero emission city logistics in the Netherlands and *data sharing* with logistics service providers

**Roadmap to zero emission city logistics, Rotterdam 2025**

<table>
<thead>
<tr>
<th>Segments</th>
<th>Subsegments</th>
<th>Most common type vehicles and propulsion 2019</th>
<th>Most common type vehicles and propulsion 2025</th>
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<tr>
<td>Fresh</td>
<td>Retail (meter)</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
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<td>Hospitality and specialists</td>
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<td>Fresh home deliveries (groceries and prepared meals)</td>
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<td>General freight</td>
<td>Retail chains (non-meter)</td>
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<td>Services (including laundry, moving, garbage)</td>
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<td><img src="image10" alt="Image" /></td>
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<td>Two-person home deliveries (furniture, white goods)</td>
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<td>Markets</td>
<td>Wholesale and retail outlets</td>
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<td>Warehousing and distribution</td>
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<td>Express and parcels</td>
<td>Express and parcels</td>
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<td>Facilities/services</td>
<td>Maintenance and service</td>
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<td>Office supplies, hospitals and municipal services</td>
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<tr>
<td>Construction</td>
<td>Public space (landscaping and construction work)</td>
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<td>Building (rail)</td>
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<tr>
<td></td>
<td>Construction €€</td>
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<tr>
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<td>Personnel</td>
<td><img src="image29" alt="Image" /></td>
<td><img src="image30" alt="Image" /></td>
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Ressources

• CHAIRE LOGISTICS CITY: www.lvmt.fr/en/chaires/logistics-city-sogaris/
• METROFREIGHT www.metrans.org/metrofreight
• Enquêtes sur les livraisons instantanées à Paris : https://hal.archives-ouvertes.fr/hal-02374915
• Urban Freight Lab: https://depts.washington.edu/sctlctr/urban-freight-lab-0
• Urban freight platform: https://www.chalmers.se/en/centres/lead/urbanfreightplatform/Pages/default.aspx
• World Economic Forum (2020) The future of the last-mile ecosystem
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