The new setting and prospects of the urban freight market: the contribution of ALICE to decarbonization of European cities

Paola Cossu – FIT CONSULTING SRL CEO
The need for collaboration between cities and industry in urban logistics

- **Concentration**: Every week until 2050, one million people will be added to the world’s cities. The increasing number of vehicle and emerging transport needs is harming quality of life.

Collaborative transportation systems have become an increasingly popular practice due to the crisis.

**BUT**

It still requires further actions to achieve climate-neutral cities and efficient logistics.

- **Internet penetration** growth in Europe is increasing with an estimation of 90% of individuals being connected in 2019.

- **New disruptive trends, technologies and models** are transforming urban logistics patterns (e-commerce, crowd-economy, autonomous vehicles)
Extremely demanding consumers: «whim logistics»

"Once you saw an iPhone, you realised that it is the future. I believe the first time a neighbour of yours orders his bottle of wine that he forgot for dinner and he gets it in 15 minutes, that's it, you want it.”

Yariv Bash, the founder of Flytrex - drones
Some interesting truths.....

B2C in the UK, Germany, and France exceeds 50% of the market.

Online sales across Europe expected to rise by 94% by 2021.

ONLINE RETAIL: 5-YEAR GROWTH FORECASTS BY COUNTRY, 2016-2021

Source: Centre for Retail Research
“Customers are always going to want more selection, faster delivery speed, and lower costs,” he added. “We believe that lower costs include lowering the costs to the environment we all live and work in every day.” **Dave Clark, Amazon**

Consumers habits move towards on-demand solutions that satisfy needs for faster delivery ("whim logistics"), causing pressure on existing logistics system. “Business as usual” is business no more.

Amazon has built a huge logistics operation to get more goods to customers’ homes in less and less time. As it moves to **reduce its reliance on legacy carriers**, the retailer has created a **network of contractors across the country** that allows the company to expand and shrink the delivery force as needed, while avoiding the costs of taking on permanent employees.
Some interesting truths

CHANGE IN THE LAST MILE MODEL

Major actors subcontracted last mile to consumers

New models completely reverse the logic

Source: Aurélien Rouquet/Neoma Business School
E-commerce is an opportunity

A consumer shopping by car (5km from home) adds to the Product 50% of the CO2 footprint of the transport supply chain till the supermarket shelf....

Source: EDWARDS AND MCKINNON, Shopping trip or home delivery: which has the smaller carbon footprint? Logistics Research Centre, Heriot-Watt University.
Is fast delivery so fundamental for an individual?

The freight transport is seeing disruption from new business models that address customer demand for ever faster delivery, as well as new technologies that are likely to reach market readiness over the next ten years.
Some delivery models (Mc Kinsley)

Identified delivery models

We thoroughly investigated the start-up scene and scanned for new technologies, which led us to identify seven operational models:

**Today’s model.** A dedicated delivery person employed by the parcel delivery service provider picks up the parcels at a consolidation point, e.g., delivery base, and delivers them directly to the recipients. Large vans are typically used as delivery vehicles.

**Drones.** Autonomous aircrafts, e.g., octopots or vertically starting planes, carry parcels up to 15 kg to their destination along the most direct route and at relatively high average speed. Like droids and AGVs, they too need to be supervised. We believe that one supervisor per roughly eight drones is a reasonable assumption.

**Bike couriers.** Couriers employed by the parcel service provider deliver a small number of parcels by bike. Today, this is often seen in point-to-point delivery, especially for B2B documents and prepared food.

**Semiautonomous ground vehicles.** A delivery person is still required, but could theoretically use the driving time more efficiently to take care of sorting or smaller administrative tasks, e.g., scanning or announcing arrival while the vehicle does the driving. These advantages need to compensate for higher investment costs, as semiautonomous ground vehicles are likely to be more expensive than regular cars or vans, at least initially. However, the delivery person will likely not be allowed to move freely while the vehicle drives, limiting the tasks that can be performed in transit. We find it difficult to see how the savings in terms of streamlined administrative tasks can compensate for the higher investment cost.

**Crowdsourcing.** Any member who has signed up as a driver to the crowdsourcing network can choose to complete a specific delivery order. The advantage of this model is its flexibility in supply, especially in covering peaks and troughs, the multi-purpose use of certain assets such as cars, as well as the low investment requirements for parcel companies. Furthermore, some companies hope to create synergies beyond regular parcel delivery, e.g., with taxi services.

**Autonomous ground vehicles (AGVs) with lockers.** AGVs deliver parcels without any human intervention. Customers are notified of the exact arrival time. Upon arrival at their door, customers are asked to pick up the parcel from the specified locker mounted on the van or truck – picture a mobile parcel locker. Granted, such vehicles would need to be supervised. We assume that a central supervisor could manage roughly eight to ten AGVs.

**Droids.** Small autonomous vehicles, only slightly larger than a regular parcel, deliver parcels to the doorstep. These vehicles are relatively slow at 5 to 10 km/h and use the sidewalk rather than the street to reach their destination. Such droids also need to be supervised, but due to their size and low speed, developers currently believe that a single supervisor could manage 60 to 100 of them.
Get ready for a world where autonomous vehicles deliver 80 percent of parcels! (Mc Kinsley)

AGVs with parcel lockers will dominate regular parcel delivery as well as time-window and same-day delivery in urban areas.

Drones will deliver all time-window and same-day items in rural areas.

If droids do not become significantly cheaper, bike couriers are likely to be the best delivery form for instant delivery in urban areas.

Traditional delivery is still unmatched for high-drop-factor B2B and e-grocery delivery.

Crowdsourcing will only play a minor role in the future of the last mile.
Load efficiency is tough if you stay alone

Full, but only 25% of weight limit

60% empty, but at weight limit

This is bad for both profitability and environment
But.. It is not that easy
Plenty of solutions

LOTS OF RESPONSES FEELS LIKE WE’RE LOST?

MULTIMODAL VAN + BIKE

WATER LINE

PALLET LIFT

GARbage COLLECTION

MOBILE HUB PARIS 2018

MULTIMODAL BIKE + TRAIN
A CALL FOR ACTION ON URBAN LOGISTICS

90% OF WW POPULATION BREATHES POLLUTED AIR
A shared asset, open network approach to supply chains.
Current research evidences that translating the working principles of the Digital Internet into the routing of freight, has huge potentials to be the real game-changer.

Physical Internet (PI) is hub-to-hub freight movements concept based on an open network rather than directly moving from origin to destination. From ownership and exclusivity to commodity/service (like the Internet already did)

In PI Parcels will be moving in an automatic way and each part of the network is working in efficiency and in a sustainable manner.

ALICE aims to substantially contribute to call for action in bringing efficiency to urban logistics and find paths to meet environmental challenges making them less onerous to meet and deliver concrete results in the next 10 years.

“I want to fill the empty space!”
(Alain Baeyens - Director Logistics / Solvay)
ALICE: the ETP on Logistics

Officially launched in Brussels in June 2013.

European transport and research policies increasingly recognize the importance of logistics for the economy and the sustainability of transport.

ALICE mission is to develop a comprehensive strategy for research, innovation and market deployment of logistics and supply chain management innovation in Europe.

ALICE is based on the recognition of the need for an overarching view on logistics and supply chain planning and control, in which shippers and logistics service providers closely collaborate to reach efficient logistics and supply chain operations.

The ALICE Thematic Group on Urban Logistics vision is to achieve full integration of freight flows in cities operations and activities that allow citizens to access the goods they require and at the same time supporting sustainable development in cities and to contribute to “Sustainable access to goods and service for people”.

“European Technology Platforms (ETPs) are industry-led stakeholder fora that develop short to long-term research and innovation agendas and roadmaps for action at EU and national level to be supported by both private and public funding”
# ALICE: the ETP on Logistics - Members

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<th>Type of Organization</th>
<th>Members</th>
<th>EU/International Associations</th>
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<tr>
<td>Shippers &amp; Retail</td>
<td>P&amp;G, L’Oréal, proQimus, Atlas Copco, Casino, HOFER, etc.</td>
<td>E.S.C, CEFIC, GS1, etc.</td>
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<tr>
<td>Logistics Service Providers, Courier and Postal operators &amp; Freight Forwarders</td>
<td>Gebrüder Weiss, Geodis, Borusan, FM-Logistic, Posteitaine, etc.</td>
<td>CLECAT, EUPLAT, etc.</td>
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<tr>
<td>Ports, Hubs, Intermodal terminals &amp; Transport Infrastructure</td>
<td>Lineas, Kalleido, Hutchison Ports, ECT Rotterdam, etc.</td>
<td>EALTH, INE, etc.</td>
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<tr>
<td>Vehicle Manufacturers &amp; Logistics operations, handling (modular units)</td>
<td>Volvo, MAN, Daimler, Scania, Logistix, TESSA, etc.</td>
<td>EUCAR, etc.</td>
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<tr>
<td>Information and Communication Technologies &amp; Consultancy</td>
<td>CEFIC, EFCE, BIMAC, Fujitsu, etc.</td>
<td>ERTICO, Lean &amp; Green, etc.</td>
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<tr>
<td>Regional &amp; National Logistics Clusters &amp; Associations</td>
<td>VNI, CLOSER, CARA, TKI DINALOG, etc.</td>
<td>Smart Freight Centre, etc.</td>
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<tr>
<td>Research and technology Centers</td>
<td>Fraunhofer, ZLG, ETRI, BIBA, etc.</td>
<td>ECTRi, etc.</td>
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<tr>
<td>European Technology Platforms /PPPs</td>
<td>WATERBORNE, EFFRA, MANUFUTUREEU, etc.</td>
<td>etc.</td>
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<td>Member States and innovation Funding*</td>
<td>etc.</td>
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*Involved in ALICE Mirror Group*
ALICE VISION is to realize PI by 2030 to pave the way to Zero Emissions by 2050.

Physical Internet will bring efficiency and sustainability to Logistics. It cannot fully solve the Decarbonization Challenge, but it will make it less onerous to meet.

And can deliver results in the critical next 10 years.
NEXT STEPS

Combining Physical Internet (2040) and Zero Logistics Emissions (2050)

Roadmaps:
- Prepare a roadmap “Towards Zero Emissions Logistics”
- Prepare a detailed roadmap “Towards the Physical Internet”
“Transport is shared responsibility between EU and Member States and urban mobility is essentially a local responsibility; however local authorities should not be left alone” (EU Commission).

Therefore ALICE Urban Logistics team works basing on the following principles:

- **Fill empty spaces** in cities supported by effective governance model
- **Cooperation, trust and quality partnership** replacing ownership and exclusivity
- **Costs for logistics** optimised, transparent and recognised
- **E-commerce** seen as opportunity and not as a problem. Responsible behaviour and cultural change from individuals are fundamental.
- **Moving goods and not vehicles**
- “**SUMPs are an opportunity for cities to include their voices regarding the future of urban mobility and propose necessary actions**” (EU Commission): people and goods mobility proportionately considered and integrated in plans
- **Continuation of innovation** and market uptake of new business models
SENSE PROJECT: Accelerating the Path Towards Physical Internet

Results from a simulation experiment with top retailers Carrefour and Casino in France and their 100 top suppliers moving from actual practice to a “Physical Internet Model” showed a potential economic benefit of 32%, a 60% reduction of greenhouse gas emissions and a potential of 50% of volume shifted from road to rail.

SENSE aims to increase the level of understanding of PI concept and the opportunities that brings to transport and logistics. By building stronger and wider support of industry, public bodies and research worlds towards the PI we may reach consensus and enable coordinated strategic public and private investments in research and innovation embracing Physical Internet that could lead us to a new much more efficient and sustainable paradigm.

Accelerating the Path Towards Physical Internet – SENSE (funded by the European Commission – Horizon 2020 in 2017) - strategic objective is to accelerate the path towards the Physical Internet (PI), so advanced pilot implementations of the PI concept are well functioning and extended in industry practice by 2030, and hence contributing to at least 30 % reduction in congestion, emissions and energy consumption.
SENSE PROJECT: Accelerating the Path Towards Physical Internet

SENSE Major Outcomes:

- Wide Industry and public bodies consensus and support on Physical Internet vision and roadmap
- Strong methodology to monitor, assess and review Physical Internet implementation Status
- Reference Knowledge Platform on Physical Internet: Market, Projects and Programs
- Better alignment on regional, member states and EU Programs supporting Physical Internet
- Reinforced International Physical Internet Community.

Activities performed partially in the frame of SETRIS. The SETRIS project has received funding from the European Union’s Horizon 2020 research and innovation Programme under grant agreement No. 653739
Five areas for PI development including generations

Access and Adoption
Governance
System Design
PI Nodes
PI Network Services
SENSE PROJECT: The knowledge platform

Knowledge Platform (link)

This is the Physical Internet Social Knowledge Platform powered by ALICE with the support of the European Commission H2020 funded project SENSE.
Physical Internet for sustainable city logistics and beyond

New Video

Link to the video
ALICE-POLIS Strategic dialogue between cities and industries on urban freight solutions

Lead transformation in cities so urban freight and logistics is proactively responding to the pollution, congestion, safety and environmental challenges.

Ensure a robust strategic industry & cities dialogue to share practices and facilitate collaboration models between cities and industry to prioritize topics and accelerate deployment of solutions towards cleaner and sustainable urban freight transport.
ALICE-POLIS Strategic dialogue between cities and industries on urban freight solutions

Approach

1. Compilation of urban logistics cases explored in the past and still running. Learning and remaining needs highlights.
2. Identification and consensus building on measures and solutions reaching scale for implementation. Develop scalable model description, and the basis of needed collaboration for implementation.
3. Provide direction local initiatives and Industry as a whole, to Horizon Europe Program and other national and European initiatives.

Involved Cities & Regions through POLIS:

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<th>Large Cities</th>
<th>Medium / Small Cities</th>
<th>Regions</th>
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<td>1. Amsterdam</td>
<td>12. Bilbao</td>
<td>19. Arnhem Nijmegen City Region</td>
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<td>3. Budapest (BKK)</td>
<td>14. La Rochelle</td>
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<td>6. Gothenburg</td>
<td>17. Helmond</td>
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<td>7. London (Tfl)</td>
<td>18. Southampton</td>
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<td>8. Madrid</td>
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<td>9. Paris</td>
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<td>10. Rome</td>
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