ASPIRE

ADVANCED LOGISTICS PLATFORM WITH ROAD PRICING AND ACCESS CRITERIA TO IMPROVE URBAN ENVIRONMENT AND MOBILITY OF GOODS

SUSTAINABLE URBAN LOGISTICS TOWARDS GREENER CITIES

Andrea Lorenzini
MemEx

MemEx

LIFE ASPIRE FINAL CONFERENCE

THE ROLE OF URBAN LOGISTICS TO THE ECOLOGICAL TRANSITION OF SMALL AND MEDIUM-SIZED HISTORIC CITIES IN EUROPE

21TH SEPTEMBER 2021

With the contribution of the LIFE financial instrument of the European Commission

Città di Lucca

MUNICIPIA GRUPPO ENGINEERING

LUCENSE

MemEx

Stockholms stad

GRAD ZADAR

LIFE16 ENV/IT/000004

Urban Mobility Governance: main axes of intervention

- Sustainable Urban Mobility Plan - SUMP
- Qualification and diversification of transport services
  (BRT-BHLS, Flexible transport, Feeder etc.)
- ITS infrastructures and digital solutions, data aggregation, crowdsourced data, Process monitoring
- **Urban Freight Transport/City Logistics**
  (last mile, UCC, Access Control, Cargo bike, etc.)
- Integration of different modalities, services interoperability
- Active mode and complementary measures
  (bike, sharing-station, vans sharing, car sharing, etc.)
- Coordination/Cooperation among different service actors mainly for the space management/competition

A MIX of SOLUTIONS enabled by TECHNOLOGIES and INFRASTRUCTURES …
but also by ORGANIZATION/OPERATION ISSUES and REGULATORY FRAMEWORKS….

Environmental issues

Carbon emissions from worldwide **freight transport** were approximately **3 billion tonnes of CO2** in 2020, representing **roughly 9%** of **total global carbon emissions**

ITF (forthcoming), Transport Outlook 2021, International Transport Forum, Paris.

City Logistics in Urban Areas

- Cause of about a **quarter of overall urban transport CO2 emissions** (and 30-50% PM and NOx)
- **Impacts on the urban environment, noise,** urban public space, and living conditions
- Relevant **traffic component in the city** (15% of circulating vehicles, even more for metropolitan areas)
- **Low load factors** for delivery vehicles (less than 50%)
- Regulated/influenced by **public authorities**
- Operated by **private companies, in general of small dimension** (85% with less than 5 employers subcontracted for urban trucks)
- Frequent/instant deliveries due e-commerce, click/collect, food on demand, home delivering, store downsizing, etc

The EU vision

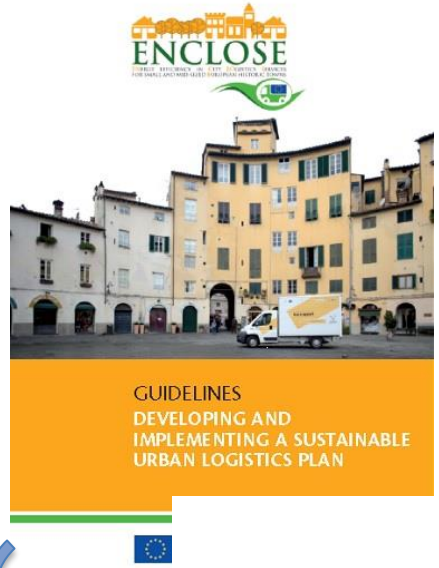
Actions: Best Practice exchange, R&D, Funding, Guidelines

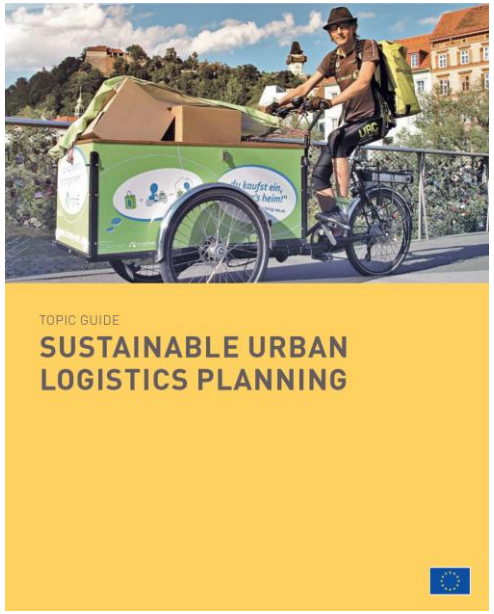
"Call for a 90% reduction of transport emissions by 2050"

The European Green Deal, 2019

'Sustainable and Smart Mobility Strategy'

- Sustainable Urban Logistic Plans - SULP
- Zero emission freight transport solutions
- Innovative solutions, including cargo bikes automated deliveries and drones
- Enforce/ Prioritise the most greening behaviours
- Detailed estimation/assessment of the carbon footprint





Answer to the needs of all the involved stakeholders is a difficult issue, as logistics is closely linked to the overall town functioning

Freight distribution in Small and Medium (Historic) Towns

More complex due to:

- City features (*old road infrastructure, narrow streets, etc.)*
- more strict access regulations
- presence of heritage and historic assets
- higher risks for pedestrian safety

… with higher impacts *(pollution, noise, etc.)*
and higher costs of logistics operation

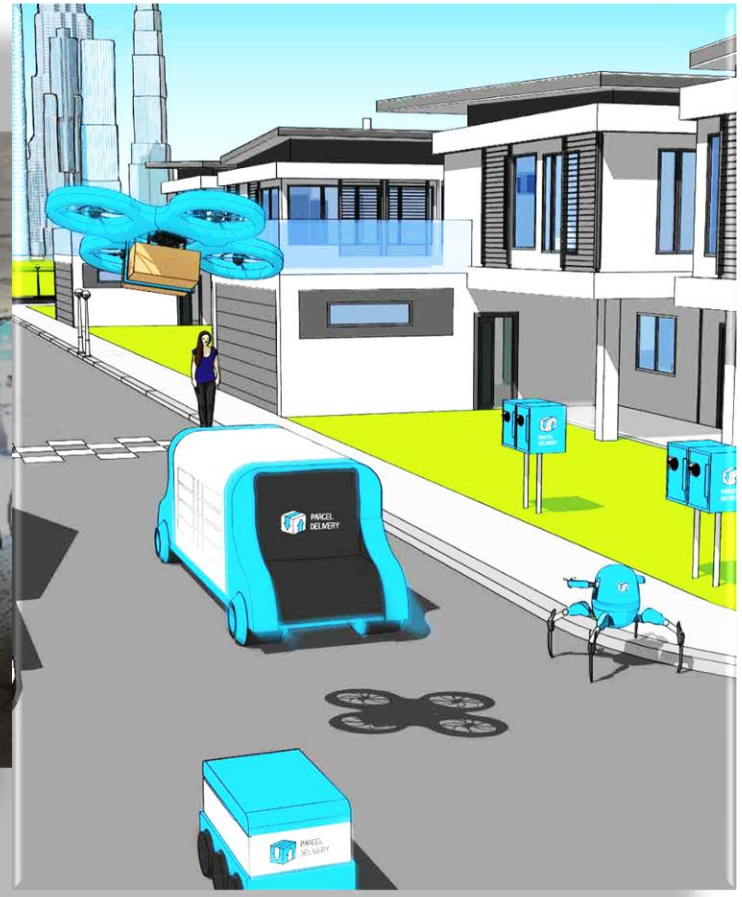
Despite there is a strong (and fair) attention on logistics operations within the inner city, with the e-commerce logistics issues have been extended to the whole urban area

21 cities with more than 1 million inhabitants
180 cities with more than 200.000 inhabitants and less 1 Ml
1364 cities between 40.000 and 200.000 inhabitants

Approaches, solutions, and practices are quite vary

Amazon locker in an Italian Supermarket

Mumbai Delivery Dabbawala, India, 2018



@McKinsey & Company, 2018

Urban Consolidation Centres

Municipality Initiative:
Top-Down approach

UCC as Final destination of retailers and/or shops
...

Last Mile and
Cross Docking Services

Long Range
Transport
Operators

ICT Platform

Track and Trace

Links long-distance and urban freight distribution

Special transport operators

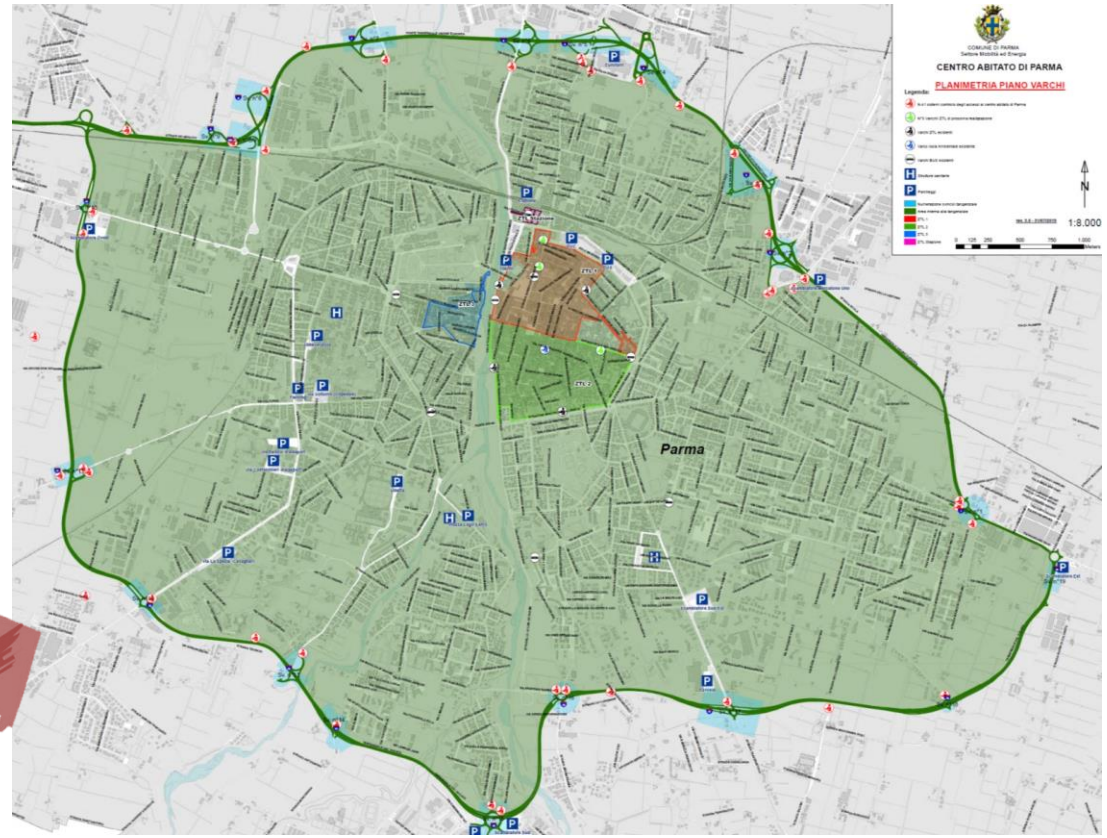
City Access Rules push the transhipment, consolidation, cooperation, etc.

UCC productivity

@KFI

UVAR & LEZ as tools for private and freight traffic

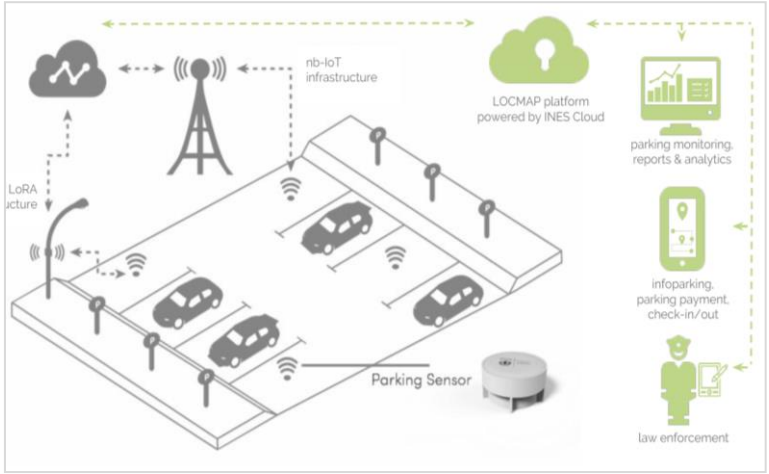
- Permissions, OCR, RFID, access/exit time, etc.
- From Access Regulation to Low-Emission Zones



- Parma Municipality approach. Source: Parma Mobility Masterplan, 2020

Parking management

- Dynamic control of load/unload parking lots
- Dynamic reservation schemes
- Permanence time control
- Violation detection, enforcement



Not just on-field solutions…also engagement and agreements

Aggregation of demand: different investments, productive dialogue

- Cooperation among shop keepers and operator
- Aggregation of the supply demand, for basic food for restaurants, bar, shop keepers
- Agreement among shopkeepers to adopt common operators and same base suppliers
- Common delivery time window among the shopkeepers
- Van sharing schemes for own account delivery
- Delivery through clean vehicles or cargo bike

Reduction of vans circulating with low load factor

Increase the bargaining power vs the suppliers (incentives for clean vehicles).

Strong concertation activities among shopkeepers

Public Authority overall responsibilities

Policy, Rules, Measures

- Specific objectives in relation to urban and mobility plan
- Setting urban freight regulation scenario (time/space)
- Access in relation to the goods-vehicle typology
- Enforcement schemes and control activities
- Make existing infrastructure available (ICT included)
- Incentives for “green vehicles” (shopkeepers, operators)

Scenario

- Less resources for investment and management
- “Facilitator” role wrt the different involved actors and stakeholders
- Role upper level Authority (Regional, National, .)

Capability/skills to planning/evaluating solutions is necessary

Logistics Operator point of view

- Need to create more Urban Vehicle Access Regulation (UVAR) commonality/uniformity in Europe, thereby preventing fragmentation of schemes and corresponding inefficiencies
- At least, a minimum level of conformance among rules on functional/bordering areas
- Long term city-rules consistency is required, as they need to plan for investments (clear timelines have to be communicated)
- UVAR should be planned taking into account the logistics processes
- Pushing the industrial investments reducing the uncertainty: green frontrunners should be incentivized

Be involved in the consultation and decision

Create a permanent **forum** among the different social/economic actors and with the other Authority level

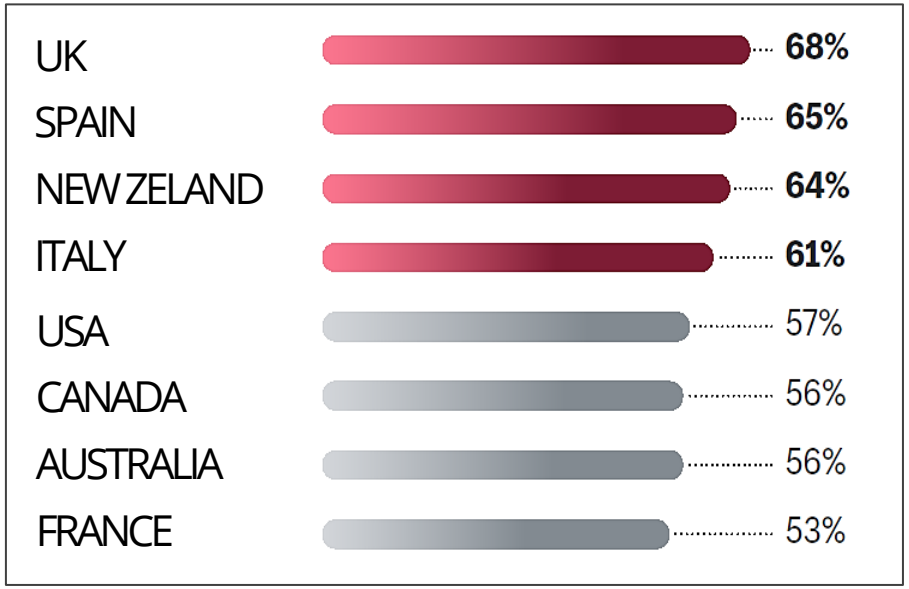
E-commerce as the future of trade

COVID-19 has boosted some existing trends

- Teens and young adults are more and more preferring to shop online
- Alternative options for collection and delivery are spreading rapidly (Pickup Points, Automated Parcel Lockers, Smart Parcel Box, Drones, etc.)
- Increased number of shops offering 'free delivery' and 'convenient/free return options'
- Growing confidence in shopping online for grocery products that is expected to develop into a lasting behavior for the majority of consumers

Shopify, 2021

Share of consumers which states that COVID-19 has changed their shop's habits



The rise of e-commerce stands to fundamentally reshape how consumers purchase products, with deep implications for supply chain management – not to mention policymaking.

The rise of e-commerce is changing the urban space, curbside management, congestion situation and also the road safety, making the traffic flow more erratica

Urban Freight Movement Challenges, Solutions and the 'New Normal. JANUARY 11, 2021, TRB URBAN FREIGHT TRANSPORTATION COMMITTEE MEETING

Urban area…and beyond

CO2 per delivery in e-commerce by settlement area, excluding returns

CORE TOWN
Tour: 60,6 km (41.7 stops)
No of parcels/tour: 152.3
Successful delivery (1st/2nd/3rd try):
85,3% / 6,0% / 0.1%
Pickup by customer: 8.6%
Distance customer CEP-store: 0.9 km
Modal split (%):
IndivT 56.3 /PublicT 28.9/Deliv 14.3/oth 0.5

Average tour: 22.85 $kgCO_2e$
Average order (parcel): 150.03 gCO_2e

TOWN IN AGGLOMERATIONS
Tour: 73.4 km (41.1 stops)
No of parcels/tour: 160.9
Successful delivery (1st/2nd/3rd try):
86.7% / 5.5% / 0.1%
Pickup by the customer: 7.8 %
Distance customer CEP-store: 1.6 km
Modal split (%):
IndivT 56.3 /PublicT 28.9/Deliv 14.3/oth 0.5

Average tour: 27.58 $kgCO_2e$
Average order (parcel): 171.41 gCO_2e

COUNTRYSIDE
Tour: 67.6 km (30.6 stops)
No of parcels/tour: 122.7
Successful delivery (1st/2nd/3rd try):
90.8% / 3.8% / 0.1%
Pickup by the customer: 5.4%
Distance customer CEP-store: 5.8km
Modal split (%):
IndivT 83.5 /PublicT 11.8/Deliv 4.3/oth 0.4

Average tour: 25.04 $kgCO_2e$
Average order (parcel): 204.07 gCO_2e



University of St. Gallen (HSG), Switzerland, Wide-ranging study on the last-mile in retail trade [Universität St. Gallen, Die „Letzte Meile" im Schweizer Detailhandel- CO2, Emissionen in Distributionskanälen im Vergleich]

Logistics services are not alone on city network

Public Transport

Street work

Pedestrians

On the same network and in 'competition' with other PT services and modality, not last also with pedestrians (curbside management)

Ambulance and Emergency vehicles

Micro-mobility

Garbage trucks

After more than two years of living with COVID-19 related restrictions

- COVID-19 involve a new thinking on the space/ area management for all the city
- Ensuring the control of the rules and the overall accessibility
- Constant stakeholder engagement
- New partnership and business model for managing the service

COVID-19 hugely impacted the transport sector, with risk of 'new rise' of massive private car use, and increase in e-commerce

Municipalities need to <u>come back</u> to a <u>central role</u> about planning and control of mobility services in an integrated scenario

@FORA

Conclusion: What do we need by Local Authorities?

Management of the digital and green transition

Foster zero-emissions solutions

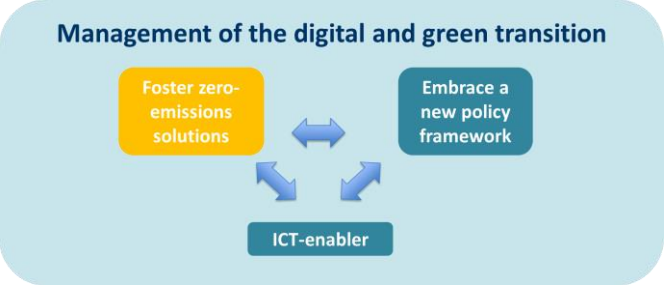
Embrace a new policy framework

ICT-enabling solutions

Conclusion: What do we need by Local Authorities?

Foster zero-emissions solutions

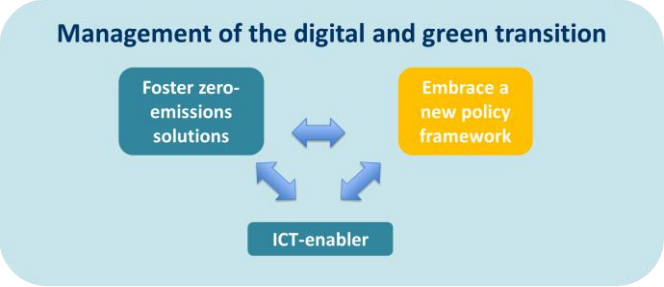
- Innovative last-mile delivery solutions (cargo-bikes, autonomous shuttles, micro-hubs, etc)
- Assess the main organisational and operational issues
- Investigate, develop and consolidate business concepts and models related to last-mile solutions



Conclusion: What do we need by Local Authorities?

Embrace a new policy framework

- In-depth understanding of how urban space, curbside management, congestion situation and road safety can be adapted
- Qualitative and quantitative evaluation of the impacts of the new last-mile delivery solutions
- Develop a possible pathway to achieve zero-emissions freight transport

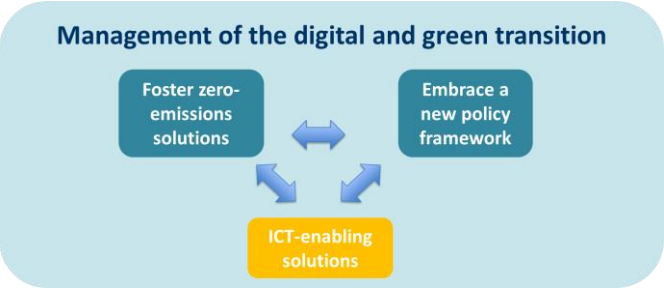


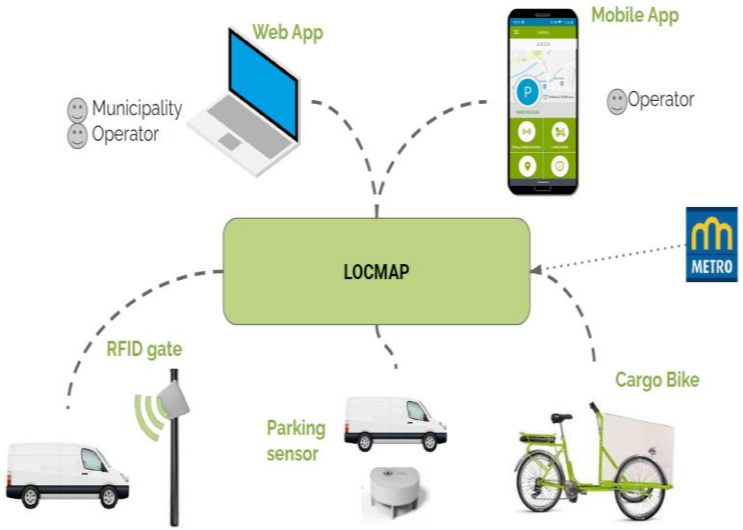
@PCA-STREAM

Conclusion: What do we need by Local Authorities?

Promote ICT-enabling solutions

- Digitalisation of logistics and freight operations and systems
- Data standards and protocols needed to guarantee the interoperability/integration
- Design and develop common platforms / tool device for monitoring and collecting traffic data and user information





ASPIRE

ADVANCED LOGISTICS PLATFORM WITH ROAD PRICING AND ACCESS CRITERIA TO IMPROVE URBAN ENVIRONMENT AND MOBILITY OF GOODS

THANKS FOR YOUR ATTENTION

Sustainable urban logistics towards greener cities

Andrea Lorenzini, andrea.lorenzini@memexitaly.it

MemEx

MemEx

LIFE ASPIRE FINAL CONFERENCE – 21TH SEPTEMBER 2021

THE ROLE OF URBAN LOGISTICS TO THE ECOLOGICAL TRANSITION OF SMALL AND MEDIUM-SIZED HISTORIC CITIES IN EUROPE

With the contribution of the LIFE financial instrument of the European Commission

Città di Lucca

MUNICIPIA GRUPPO ENGINEERING

LUCENSE

MemEx

Stockholms stad

GRAD ZADAR

LIFE16 ENV/IT/000004