New cooperative business models and guidance for sustainable city logistics

Georgia Ayfadopoulou
Project Coordinator
Centre for Research & Technology Hellas (CERTH)
Hellenic Institute of Transport (HIT)
Objectives vs Challenges (1)

Provide practical approach to local Authorities & Industry for adopting innovative & sustainable city logistics solutions

Support the change & achieve paradigm shift in UFT planning
Objectives vs challenges (2):

Implementing Integrated Approach in 12 cities

- Different countries
- Different Priorities & Needs
- Different levels of Maturity
- Different Mixture of Measures

- The same objective: A more sustainable & liveable city
Consortium identity

<table>
<thead>
<tr>
<th>Research &amp; Academia (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSITY of THESSALY</td>
</tr>
<tr>
<td>newrail</td>
</tr>
<tr>
<td>SAPIENZA Università di Roma</td>
</tr>
<tr>
<td>Venice International University</td>
</tr>
<tr>
<td>CENIT</td>
</tr>
<tr>
<td>AKADEMIA NORSKA SCZEGN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional/ City authorities (11)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regione Emilia-Romagna</td>
</tr>
<tr>
<td>London Borough of Barking &amp; Dagenham</td>
</tr>
<tr>
<td>CITY of ATHENS</td>
</tr>
<tr>
<td>CITY OF COPENHAGEN</td>
</tr>
<tr>
<td>CITY OF ROMA</td>
</tr>
<tr>
<td>MECHelen Mobilità</td>
</tr>
<tr>
<td>CITTÀ di TORINO</td>
</tr>
<tr>
<td>City of Gothenburg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industrial actors (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RENAULT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Association/ Networks /Consultants (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLIS</td>
</tr>
<tr>
<td>IRU Projects</td>
</tr>
<tr>
<td>ERTICO ITS Europe</td>
</tr>
<tr>
<td>BIM</td>
</tr>
<tr>
<td>Panteia Research to Progress</td>
</tr>
</tbody>
</table>
Project Outcomes to city logistics community
1. Real implementations: 12 Cooperative UFT solutions

- 24h delivery
  - Home deliveries: LSPs, S&R
  - E-commerce system for small shops: LSPs, S&R

- ITS for UFT monitoring
  - ITS for sustainable access control: LSPs, IP, PA
  - ITS for data collection in Planning: LSPs, IP, PA

- Consolidation
  - Urban consolidation centres: LSPs, IP, PA
  - Microconsolidation - Lockers introduction: LSPs, S&R
  - Actors cooperation initiative for increased load factor in vehicles: LSPs

- Intermodality
  - Urban Transhipment facilities & mobile depots: LSPs, IP, PA
  - Rail Road combination for reducing no of vehicles: LSPs, IP, PA

- Micro distribution
  - Cargo bikes for B2B and B2C: LSPs
  - Electric vehicles for mobile collection & delivery: LSPs

- Use of Public Transport for freight delivery: PA, LSPs S/R

Logistics Services Providers: LSPs, Shipper/receiver (S/R), Public agency (PA), Infrastructure provider (IP),
Example of industrial stakeholders participation to NOVELOG implementations: Turin

- The City of Turin and RINA Consulting as partners of the Novelog Project
- The main logistics operators: GLS, FedEx, BARTOLINI, TNT, UPS, DHL
  (50 vehicles = 80% of the totals)
- The main technological operators: torinowireless, TIM, Tecnologie Telematiche Trasporti Traffico Torino, VIA SAT

7
2. SULP’s Guidance process

### Need for Sustainable Logistics Plans
Development Similar to that of SUMP's

#### Step-by-Step Process

<table>
<thead>
<tr>
<th>Phase I: Prepare well</th>
<th>Phase II: Rational and transparent goal setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Identify UFT key stakeholders and organize the SULP Multi-stakeholder platform</td>
<td>6.1. Identify and develop effective package of measures</td>
</tr>
<tr>
<td>1.2. Assess &amp; improve city's knowledge on its UFT profile</td>
<td>6.2. Learn from other experience</td>
</tr>
<tr>
<td>1.3. Review availability of resources</td>
<td>6.3. Consider value for money</td>
</tr>
<tr>
<td>5.1. SULPs objectives definition</td>
<td>5.2. SMART targets definition</td>
</tr>
<tr>
<td>5.3. Evaluation of UFT plans</td>
<td>4.1. Develop a common vision among UFT stakeholders and define the future UFT scenarios</td>
</tr>
</tbody>
</table>

**SULP planning**

- Development of effective package of measures
- Setting priorities and measurable targets
- Development of a common vision & future improvement scenarios
- Analysis of the city’s current UFT situation
- Determination of the city’s potential for a successful urban freight planning
- Definition of the development process and scope of plan
- Look beyond boundaries
- Involve the stakeholders in the planning process
- Finalize the work plan and the management arrangements
- Analyze the current UFT situation

---

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 733065.
3. Data Collection Framework for UFT

**Pillar 1**
Profile of major supply chains served in the urban area under study

**Pillar 2**
- Mapping of urban freight and service trips activity

**Pillar 3**
Applied Organizational and legal framework

**Pillar 4**
Procedural and technological methods and innovations used
Conceptual layout of the Framework

- **One approach for**
  - UFT Planning
  - Describing UFT
  - Assessing UFT

---

**Tier 1:** Basic data to be collected
- Pillar 1: Profile of major supply chains
- Pillar 2: Mapping freight & service trips
- Pillar 3: Organizational and legal framework
- Pillar 4: Procedural & technological methods and innovations

---

**Tier 2:** Methods for data analysis
- Methods
- Methods
- Methods
- Methods

**Tier 3:** Data elaborations
- Collections
- Collections
- Collections
- Collections

**Tier 4:** Use of collections
- Dataset
- Dataset
- Dataset
- Dataset

---

**novelog**
4. Tools for assisting UFT planning

New Cooperative Business Models and Guidance for Sustainable City Logistics

WHERE ARE THE CITY CASES

- Athens
- Turin
- Graz
- Rome
- Barcelona
- Mechelen
- Gothenburg
- Verona
- Copenhagen
- Pisa
- London (LBB)
- Bologna
- Reggio Emilia

12 NOVELOG cities

Novelogs Services

- UC Tool
- Toolkit
- Evaluation Tool
- Guidance Tool

Dashboard

www.uct.imet.gr
Tools for NOVELOG integrated planning approach

Facilitate interaction & consensus among stakeholders regarding the current & future state of their UFT environment

All UFT measures are not applicable to all cities: assess the applicability of certain UFT measures to certain types of cities

Assess the impact of a wide spectrum of UFT measures in real-life environments

Guide implementers of UFT measures on the most appropriate business models for their successful introduction & sustainable operation
NOVELOG-UCT: Understanding cities’ UFT tool

1. Stakeholders Governance Platform
2. Web DELPHI & PROMHTHEE for consensus building
3. Dashboard for UFT comparison and benchmarking
UFT comparison & benchmarking

Number of deliveries per establishment per week
- 6-10 - Barcelona, LBBD, Turin
- 16-40 - Copenhagen

Share of deliveries between 07:00-10:00
- 21-40% - LBBD, Turin
- 41-60% - Venice
- 20-30% - Copenhagen
- <20% - Turin, Venice
- 61-80% - Copenhagen

Empty running
- <20% - Turin, Venice
- 20-30% - Copenhagen

Average vehicle dwell time - minutes per delivery
- 5-10min – Pisa, Turin
- 11-20 min - LBBD

Average size of goods delivered per drop
- < ½ pallet - Copenhagen
- ½ pallet - Turin
- 1 pallet - Barcelona
NOVELOG Toolkit: relates city typology & measures

Why? (Problem & Objectives)

Where? (City Morphology, UFT Logistics Profile)

Who? (UFT Markets, Key Stakeholders)

How? (Nature of Implementation)

Database of all previous UFT measures implementations
NOVELOG-EVALOLOG: Assessing impacts of UFT measures

1. **EX-POST & EX-ANTE evaluation of UFT measures in a city**

2. **Electronic library of alternative methodologies for quantifying evaluation indicators.**

3. **Life cycle analysis**

4. **UFT sustainability Index**
1. Dedicated Business Models for UFT measures

2. Multi-stakeholders Platform mixture, organization & operation

3. Yellow Pages for commonly asked questions for UFT

<table>
<thead>
<tr>
<th>Stakeholder’s Category</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain Stakeholders</td>
<td>25%</td>
</tr>
<tr>
<td>(Transport Operators, Freight Forwarders, Retail chains, Shop owners e.t.c.)</td>
<td></td>
</tr>
<tr>
<td>Public Authorities</td>
<td>25%</td>
</tr>
<tr>
<td>(Local % National government e.t.c.)</td>
<td></td>
</tr>
<tr>
<td>Other Stakeholders</td>
<td>38%</td>
</tr>
<tr>
<td>(Industry % Commerce Associations, Research % Academia, Consumer Associations e.t.c.)</td>
<td></td>
</tr>
<tr>
<td>Experts</td>
<td>12%</td>
</tr>
</tbody>
</table>
5. Methodology for Transferability through NOVELOG City Typology for selecting UFT measures.

NOVELOG TYPOLOGY

Why (Dimension)
- Problems (Parameter)
- Objectives (Parameter)

Where (Dimension)
- City Morphology (Parameter)
- UFT Logistics Profiles (Parameter)

Who (Dimension)
- UFT Markets (Parameter)
- Key stakeholder (Parameter)

What (Dimension)
- Measures (Parameter)

How (Dimension)
- Nature of Implementation (Parameter)
  - Nature of business model

NOVELOG Deliverable 4.1. “Integrated inventory of urban freight policies and measures, typologies and impacts”) pp 5 of 120
### 6. Appropriate Business Models for viable city logistics measures

<table>
<thead>
<tr>
<th>Consolidation scheme</th>
<th>Customer (offering)</th>
<th>Value proposition</th>
<th>Reduced value proposition</th>
<th>Revenue stream</th>
<th>Cost structure</th>
</tr>
</thead>
</table>
| Urban consolidation centre (UCC) | LSP (UCC services) | Green branding  
Responsiveness to delivery (due to proximity)  
Value-added services | Additional fixed costs  
Additional handling | Subscription model | Existing UCC to be renovated  
Operational costs |
| | LSP (EV rental solutions) | Green branding  
EV rental (and recharging) | Additional transport costs | Subscription model | Purchase of vehicles and charging system |
| Micro-consolidation centre (MCC) | LSP (Light goods delivery) | For receivers – higher availability and therefore convenience  
Reduced transport cost  
Access to restricted area  
Pick-up point for parcels | Additional handling | Long-term contract with LSP  
No extra cost to receiver  
Charged for parcel pick-up | Investment and operational costs for MCC  
Real estate (provided by municipality)  
Investment and operational cost for cargobike deliveries |
| | (Other) LMO (Bicycle servicing) | Bicycle repair, recharge, | None (additional service) | Per use | ICT fleet management system |
| | City council (Delivery/transport data) | Understand UFT flows for e-commerce | None | - | |
| Receiver-led consolidation (RLC) | Retailers in shopping (replenishment with consolidated transport) | Delivery flexibility  
Delivery reliability and punctuality  
“Basic” transport service cost reduced  
Value-added services | None | Base service – paid by shopping centre owners  
Extra services – paid by tenants | Use of existing UCC/warehouse -> no new investment cost  
Operational costs |
| Automated locker system (ALS) | LSP (Light goods delivery) | Reduced failed deliveries  
Reduced costs for transport  
Access to city  
Green branding | Extra costs for usage | Pay-per-use charged to LSP | Real estate (fully funded by municipality)  
Installation of lockers |
| | Receivers (Light goods delivery) | Reception flexibility  
Reception accessibility  
No extra cost | May not fit every receiver due to travelling | None | Operating costs (maintenance, surveillance, energy, ICT system) |
7. Minimum dataset describing UFT for regular collection (observatory)

No of cities: 12
No of stakeholders: 196

- Number of deliveries/collections
- Time of day of delivery/pick up
- Empty running
- Time to carry out deliveries/collections
- Type & quantity of goods delivered/collected
- No of vehicle & Vehicle size/type
- Loading/unloading activities
- Environment-friendly distribution
- Journey speed
- Journey length

Recommendations for Regulation & incentives for data provisioning by the industry
8. Valid Stakeholder’s Operational Agreements

Service Level Agreement for a Freight Network

PARTNERSHIP AGREEMENT

Between
[enterprise]
and
City of Copenhagen

an agreement has today been entered into on cooperation/development in
[Energy Production/Energy Consumption/Urban Nature/Green Mobility/Climate Adaptation/Sustainability]
NOVELOG SULP Guidelines

A method to implement for making a SULP
A Sustainable Urban Mobility Plan is a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation and evaluation principles.

- Published in 2015
- 11 main steps & 32 activities
- Mainly emphasizes in passenger mobility
- No concrete guidelines on how to achieve efficient and effective urban freight transport

Eltis: The Europe’s main observatory on urban mobility
The **NOVELOG project** is filling the gap of the current SUMP approach by suggesting **specific guidelines** on how a local authority could **incorporate UFT measures and policies** in their SUMP.
SULP Guidelines – 6 Steps 13 activities

1. Determination of the city’s potential for a successful urban freight planning process.
2. Definition of the development process and scope of the plan.
3. Analyse the current UFT situation.
5. Setting priorities and measurable targets.
Step 1: Determination of the city’s potential for a successful urban freight planning process (4 activities)

1.1. Define responsible team in the municipality/city authority for the SULP design and implementation

1.2. Identify UFT key stakeholders and organize the SULP Multi-stakeholder platform (MSP)

• Best practice: Implement a Multi-stakeholder Platform

Perfect Mixture of a Multi-stakeholder platform

<table>
<thead>
<tr>
<th>Stakeholder’s Category</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Chain Stakeholders</td>
<td>25%</td>
</tr>
<tr>
<td>(Transport Operators, Freight Forwarders, Retail chains, Shop owners e.tc.)</td>
<td></td>
</tr>
<tr>
<td>Public Authorities</td>
<td>25%</td>
</tr>
<tr>
<td>(Local % National government e.tc.)</td>
<td></td>
</tr>
<tr>
<td>Other Stakeholders</td>
<td>38%</td>
</tr>
<tr>
<td>(Industry % Commerce Associations, Research % Academia, Consumer Associations e.tc.)</td>
<td></td>
</tr>
<tr>
<td>Experts</td>
<td>12%</td>
</tr>
</tbody>
</table>

Turin-Italy

• Express couriers (TNT, SDA, BARTOLINI, DHL, UPS, GLS)

• Industrial Stakeholders (ANFIA, API, Confindustria, Federauto, Unione Industriali, UNRAE)

• Association and logistics operators (AICAI, Apsaci, FEDIT, Federdistribuzione, Confartigianato Trasporti, FITA C.N.A., FAI)

• Retailers associations (ASCOM – Confcommercio, C.N.A., Confartigianato, Confcooperative, Confesercenti)

• Public Authority (Local Chamber of Commerce, Municipality of Turin, Ministry of Infrastructure and Transport, Piedmont Region)

• Technology partners (ST, Viasat, Torino Wireless)

• Freight Villages (Sito Interporto)
Step 1: Determination of the city’s potential for a successful urban freight planning process

1.4. Review availability of resources

1) Confirm in the MSP meeting the tools and data that are available for UFT planning

2) Compare the data proposed in NOVELOG Data Collection Framework with your own resources, to identify which further data should be collected.

- RFID gates & passes
- Flow sensors
- Draft SUMP
Step 2: Define the development process and scope of the plan (3 activities)

2.1. Look beyond boundaries

NOVELOG created a poly-parametric city typology of cities where a city can be described based on six main criteria:

1) Economic activity, Infrastructure, Gross Domestic Product
2) Degree of integration of freight generating activity, such as the presence of a few large employers in a City
3) Political culture
4) Culture
5) Degree of logistics sprawl
6) Legal and regulatory framework.
Step 2: Define the development process and scope of the plan

2.2. Involve the stakeholders in the planning process

The NOVELOG Understanding the Cities Tool (UCT) through a web-enabled Delphi methodology, allows for virtual MSP meetings and opinion management techniques.
Step 2: Define the development process and scope of the plan

2.3. Finalize the work plan and the management arrangements

The management and implementation arrangements may be formalized in written Memorandum of Understandings among the UFT stakeholders participating in the MSP.
Step 3: Analyse the current UFT situation (2 activities)

3.1. Identify the main characteristics and external influencing factors of your city’s UFT environment

- Which are the factors influencing UFT in my city?
- Which are my city's main UFT characteristics?
Step 3: Analyse the current UFT situation

3.2. Analyze problems and opportunities

- Understand the current state of the city’s UFT.
- Identify the problems the opportunities
- How do you imagine your city in the future?

The city’s main UFT characteristics

<table>
<thead>
<tr>
<th></th>
<th>Today</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of day of delivery/pick up</td>
<td>41-60% ± 5%</td>
<td>+5-15%</td>
<td></td>
</tr>
<tr>
<td>Empty running</td>
<td>&lt;20% ± 5%</td>
<td>± 5%</td>
<td></td>
</tr>
<tr>
<td>Loading activities: docking</td>
<td>21-30min</td>
<td>11-20min</td>
<td>5-10min</td>
</tr>
<tr>
<td>Delivery activities: round trip delay</td>
<td>21-25min</td>
<td>16-20min</td>
<td>21-25min</td>
</tr>
</tbody>
</table>
4.1. SULP Objectives definition

“A vision needs to be specified by concrete objectives, which indicate the type of change desired. These changes also need to be measurable. This requires selecting a well-thought-out set of targets that focus on selected areas (indicators).” ELTIS

<table>
<thead>
<tr>
<th>City's primary objectives</th>
<th>City's secondary objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic: increase UFT system efficiency</td>
<td>increase delivery load factor</td>
</tr>
<tr>
<td>Environmental: Reduce CO2 emissions</td>
<td>increase use of clean technologies/delivery means (EVs, bikes, walk)</td>
</tr>
<tr>
<td>Social: improve service accessibility</td>
<td>introduce Urban Consolidation Centres</td>
</tr>
<tr>
<td>change behaviour towards sustainable UFT</td>
<td>adopt new business models</td>
</tr>
<tr>
<td>reduce congestion</td>
<td>introduce new/adapted regulatory schemes (SULPs, LTZs)</td>
</tr>
<tr>
<td></td>
<td>provide evidence/incentives for further adoption</td>
</tr>
<tr>
<td></td>
<td>“shared” freight and passengers schemes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expected impacts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15% CO2 emissions reduction</td>
<td></td>
</tr>
<tr>
<td>5% deliveries reliability increase</td>
<td></td>
</tr>
<tr>
<td>4% accidents / damages decrease</td>
<td></td>
</tr>
<tr>
<td>8% traffic reduction</td>
<td></td>
</tr>
<tr>
<td>Operational costs reduction</td>
<td></td>
</tr>
<tr>
<td>stakeholders behaviour improvement towards sustainable UFT</td>
<td></td>
</tr>
</tbody>
</table>
Step 4: Develop a common vision and future improvement scenarios

4.2. Development of future improvement scenarios

- 3 time horizons (current, 2020, 2030),
- three levels of development (minimum, medium, maximum)
- 3 iterations
- Suggested actions: Training actions before implementing the consensus building; personal meetings with the stakeholders; workshops implementation
Step 5: Set priorities and measurable targets

- **Selection of the most suitable KPIs**
- **The Novelog Evaluation framework also proposes alternative methods for collecting evaluation data and quantifying Key Performance Indicators (KPIs).**

<table>
<thead>
<tr>
<th>Module</th>
<th>Impact Areas</th>
<th>Collected relevant data indicators</th>
<th>Wish list of indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact assessment</td>
<td>Mobility</td>
<td>Number of deliveries with “bring mE” (nr., amount of shipments, distance, weight, volume)</td>
<td>Load factor; Vehicle utilisation factor; Traffic throughput; Violations; Punctuality;</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
<td>Number of deliveries with “bring mE” (nr, amount of shipments, distance, weight, volume) - but based only on the number of deliveries a reduction of GHG emissions can only be estimated but not calculated</td>
<td>CO2 emissions; Behavioural on Greening;</td>
</tr>
<tr>
<td>Adaptability and transferability</td>
<td>Adaptability</td>
<td></td>
<td>Stakeholder acceptance; Stakeholders percentage; Adoption rate;</td>
</tr>
<tr>
<td></td>
<td>Transferability</td>
<td>Transferability to new project areas</td>
<td></td>
</tr>
<tr>
<td>Risk analysis</td>
<td>Political and social framework</td>
<td>Access regulations for pedestrian zones</td>
<td>Lack of willingness from stakeholders for cooperation;</td>
</tr>
<tr>
<td></td>
<td>Economic, legal and organizational support</td>
<td></td>
<td>Behavioural - Compliance with regulations;</td>
</tr>
<tr>
<td></td>
<td>Infrastructure requirements</td>
<td></td>
<td>Urban space engagement; Infrastructure usage;</td>
</tr>
<tr>
<td></td>
<td>Time of the actions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 6: Identify and develop an effective package of measures (4 activities)

• 6.1. Identify effective measures
  – The NOVELOG City Typology

• 6.2. Learn from other experiences
  – The NOVELOG Toolkit

Past experiences
by cities with Bologna’s morphology and objectives

Barcelona
Paris
Amsterdam
Stuttgart

Ecologistics awareness
Land use planning & Infrastructure
Step 6: Identify and develop an effective package of measures

• 6.3. Impact Assessment Evaluation
  – Ex-ante and Ex-post impact assessment of UFT measures by reporting indicators
### Step 6: Identify and develop an effective package of measures

#### 6.4. Consider value for money

- **Appropriate Business Models for viable city logistics measures**

<table>
<thead>
<tr>
<th>Consolidation scheme</th>
<th>Customer (offering)</th>
<th>Value proposition</th>
<th>Reduced value proposition</th>
<th>Revenue stream</th>
<th>Cost structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urban consolidation centre (UCC)</strong></td>
<td>LSP (UCC services)</td>
<td>Green branding, Responsiveness to delivery (due to proximity), Value-added services</td>
<td>Additional fixed costs, Additional handling</td>
<td>Subscription model</td>
<td>Existing UCC to be renovated, Operational costs</td>
</tr>
<tr>
<td></td>
<td>LSP (EV rental solutions)</td>
<td>Green branding, EV rental (and recharging)</td>
<td>Additional transport costs</td>
<td>Subscription model</td>
<td>Purchase of vehicles and charging system</td>
</tr>
<tr>
<td></td>
<td>LSP (Light goods delivery)</td>
<td>For receivers – higher availability and therefore convenience, Reduced transport cost, Access to restricted area, Pick-up point for parcels</td>
<td>Additional handling</td>
<td>Long-term contract with LSP, No extra cost to receiver, Charged for parcel pick-up</td>
<td>Investment and operational costs for MCC, Real estate (provided by municipality)</td>
</tr>
<tr>
<td></td>
<td>(Other) LMO (Bicycle servicing)</td>
<td>Bicycle repair, recharge,</td>
<td>None (additional service)</td>
<td>Per use</td>
<td>Investment and operational cost for cargobike deliveries</td>
</tr>
<tr>
<td></td>
<td>City council (Delivery/transport data)</td>
<td>Understand UFT flows for e-commerce</td>
<td>None</td>
<td>-</td>
<td>ICT fleet management system</td>
</tr>
<tr>
<td><strong>Micro-consolidation centre (MCC)</strong></td>
<td>Retailers in shopping (replenishment with consolidated transport)</td>
<td>Delivery flexibility, Delivery reliability and punctuality, “Basic” transport service cost reduced Value-added services</td>
<td>None</td>
<td>Base service – paid by shopping centre owners, Extra services – paid by tenants</td>
<td>Use of existing UCC/warehouse -&gt; no new investment cost, Operational costs</td>
</tr>
<tr>
<td><strong>Receiver-led consolidation (RLC)</strong></td>
<td>LSP (Light goods delivery)</td>
<td>Reduced failed deliveries, Reduced costs for transport, Access to city, Green branding</td>
<td>Extra costs for usage</td>
<td>Pay-per-use charged to LSP</td>
<td>Real estate (fully funded by municipality), Installation of lockers</td>
</tr>
<tr>
<td></td>
<td>Receivers (Light goods delivery)</td>
<td>Reception flexibility, Reception accessibility, No extra cost</td>
<td>May not fit every receiver due to travelling</td>
<td>None</td>
<td>Operating costs (maintenance, surveillance, energy, ICT system)</td>
</tr>
</tbody>
</table>
Thank you

www.novelog.eu
gea@certh.gr.gr