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Athens, Greece



GREEN-LOG

Cooperative and Interconnected Green delivery solutions towards
an era of optimized zero emission last-mile Logistics

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Session 6.E Innovation Urban Delivery Vehicles and Solutions

13-15 JUNE 2023 Athens, Greece
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alice | Alliance for
Logistics Innovation
through Collaboration
in Europe



Expanding the logistics Scope

Project Facts

| | |
|-----------------------------------|---|
| Project number | 101069892 |
| Project Name | Cooperative and Interconnected Green delivery solutions towards an era of optimized zero emission last-mile Logistics |
| Project acronym | GREEN-LOG |
| Type of action | HORIZON Innovation Actions (IA) |
| Service | CINEA/C/03 |
| Topic | HORIZON-CL5-2021-D6-01-08 |
| Project Duration (Start-End Date) | 42 months (01 January 2023 - 30 June 2026) |
| Number of partners | 29 |
| Number of countries | 10 (EE, LU, GR, ES, CY, BE, SE, IT, RO, UK) |
| Coordinator | Netcompany-Intrasoft (INTRA) |
| EU contribution | € 6,260,158.00 |



IPIC 2023

Current Issues in the Last-Mile Urban Freight

- **Lack of consumer involvement in the logistics system:** inadequate communication among shippers, receivers and LSPs that leads to inefficiencies
- **Fragmented last-mile operations with limited knowledge and data exchange** among LSPs
- Unrealistic **consumer expectations** (e.g. 'free delivery' mindset)
- Others

EU Goals

- Europe needs to manage the transformation of supply-based transport with a primary target to ensure a **90% cut in emissions by 2050**, delivered by a smart, competitive, safe, accessible and affordable transport system and services for passengers and goods.
- Within this quest, **cargo bikes, in urban and peri-urban areas** has shown to be a game changer for cities but its full potential has not been achieved in any European city.
- The latest call seeks for new ideas in **optimising last mile deliveries** with clear benefits but also well-defined plans on how it can be replicated across several cities.
- Social innovations should be considered, notably as new tools, ideas and methods leading to **active citizen engagement** as drivers of social change, social ownership, and new social practices.

60%

of the world
population will live in
urban areas

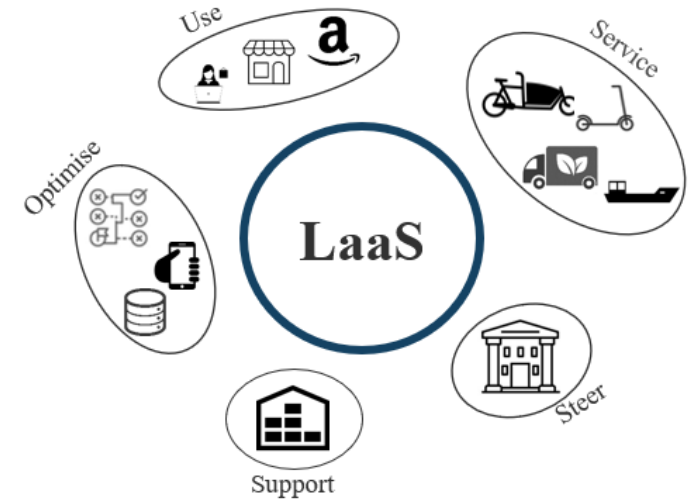
78%

growth through 2030
in urban last-mile
deliveries

Project Goals

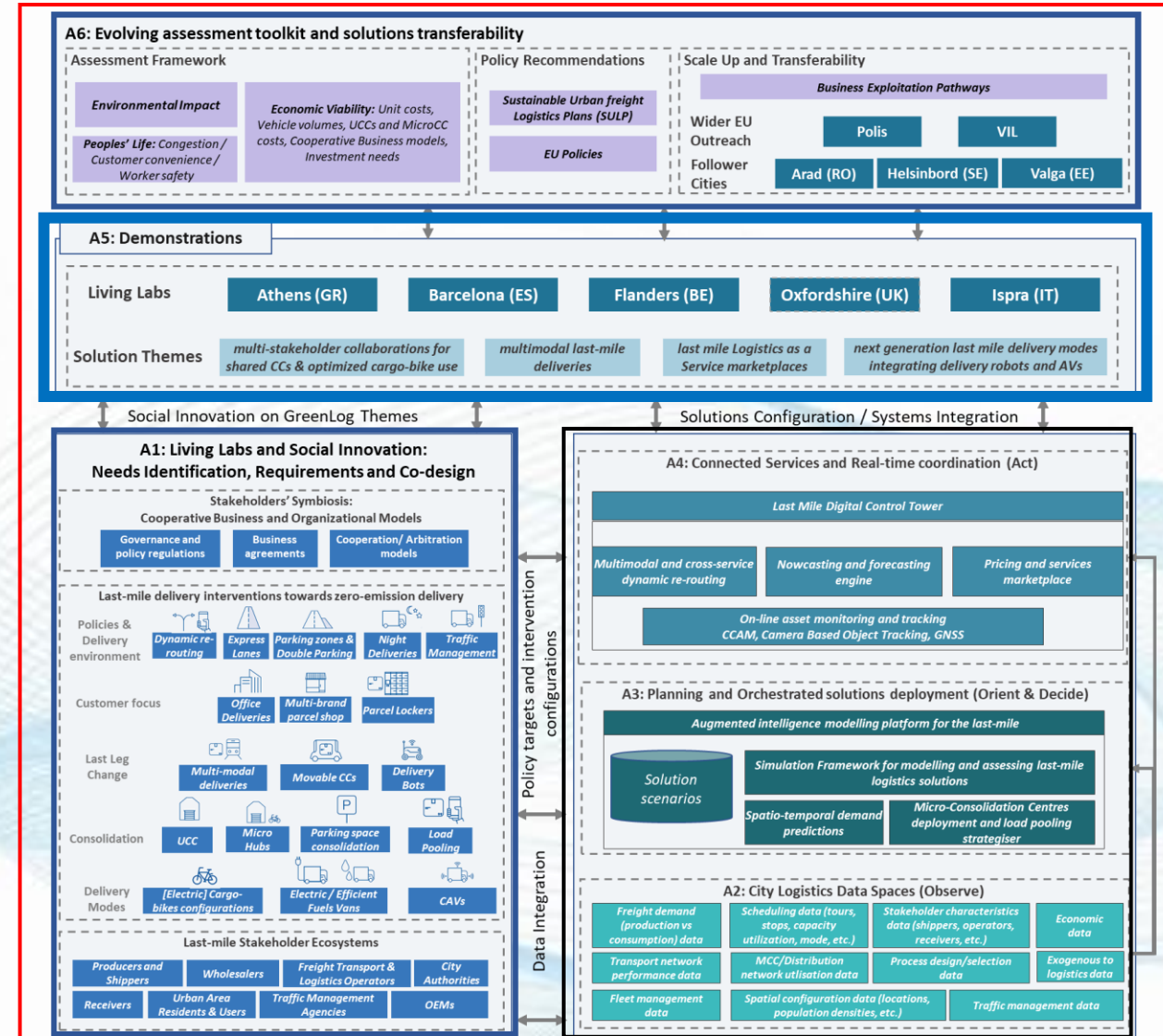
GREEN-LOG aims to

- DEVELOP **Logistics-as-a-Service platforms** for interconnected city logistics, **automated delivery concepts** using autonomous vehicles and delivery droids, **cargo-bike-based innovations** for sustainable micro-consolidation, and **multimodal parcel deliveries** integrating public transportation.
- BRING together city logistics ecosystems and supporting them **to introduce innovative last-mile delivery solutions.**
- ACCELERATE **the shift to sustainable and smart mobility** in last mile delivery as defined by the European Green Deal action plan and the EC's Roadmap to a Single European Transport Area, while building upon the recommendations of the European Environment Agency for first/last/only mile (F/L/O) modes.
- DELIVER a **fully functioning and solid system prototype**, with well-integrated components **demonstrated in the operational environment** of well-designed pilot cases.



Project main objectives & approach

- **Objective 1:** Design sustainable and cost-efficient cooperative last mile delivery solutions (WP1)
- **Objective 2:** Enable last mile delivery ecosystems to design, test and configure last mile interventions to achieve sustainable businesses, road transport efficiency and environmental goals (WP2)
- **Objective 3:** Manage and optimize last mile delivery and road transport efficiency in real time through dynamic and interconnected services and interfaces (WP3)
- **Objective 4:** Demonstrate the GREEN-LOG approach and last mile delivery solutions in five representative living lab cities and areas (WP4)
- **Objective 5:** Accelerate the large take up of the GREEN-LOG last mile delivery solutions through continuous impact creation activities (WP5)



GREEN-LOG Living Labs and Demonstrations

GREEN-LOG LLs provide an inclusive set of **demonstration sites** that cover EU regions with different Urban Logistics characteristics, and varying challenges related to sustainability, congestion and urban density, economic growth, social change and business ecosystem.



Living Labs

1. Athens, Greece
2. Barcelona, Spain
3. Flanders (Ghent, Mechelen, Leuven), Belgium
4. Oxfordshire, United Kingdom
5. Ispra, Italy



Follower Cities

1. Arad, Romania
2. Helsingborg, Sweden
3. Valga, Estonia



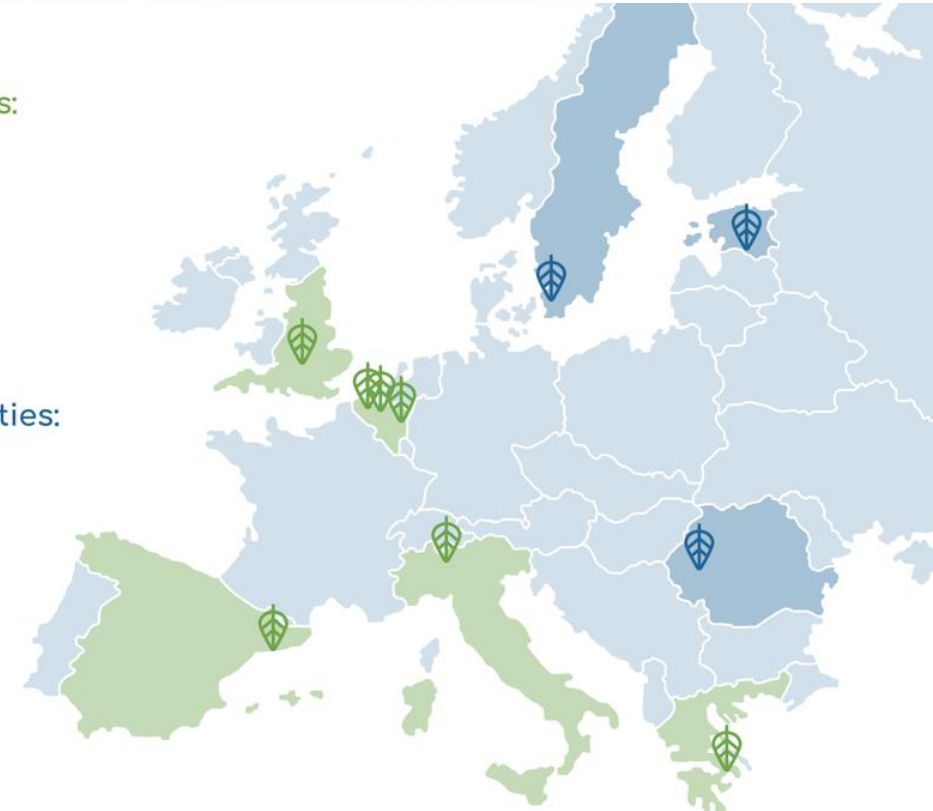
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The approach of LaaS to offer interconnected green delivery solutions

One of the GREEN-LOG Solutions

- **What is LaaS?**
 - “Logistics as a service” is dedicated to the development of principles, concepts and prototypes of flexible and modular logistics IT services and infrastructures.
- **Why LaaS?**
 - LaaS is a new solution in the market to assist companies to manage their entire transportation network, freight operations, warehouses, retail distribution etc. to add value to their business.
 - LaaS comes as a solution to facilitate the integration of the consumer in the supply chain.
 - Openness in transport management, visibility of properties, and data connectivity.
- **GREEN-LOG platform and offerings**
 - Logistic as a service platforms for interconnected city logistics and automated delivery concepts with the use of **autonomous vehicles and delivery droids**.
 - An **augmented intelligence platform** for modelling last mile interventions and integrated last-mile solution scenarios, supporting planning decisions and understanding of the effects of the solutions in urban and peri-urban city transport networks.
 - **LaaS marketplace** that makes use of urban logistics data to link demand and supply in order to improve the sustainability of city logistics.
 - **Integrated real-time and connected services** supporting the operational coordination of last-mile delivery ecosystems by monitoring delivery assets, providing near-now and short-term estimation of transport demand and supply, data driven analytics and generate event based and data driven reactions in the form of multi-modal and dynamic re-routings.

The LaaS Concept benchmarked with MaaS

| Key Points | MaaS (Jittrapirom et al., 2017) | LaaS (Beckers et al., 2023) |
|----------------------------------|--|---|
| Integration | <ul style="list-style-type: none">• Aiming at increasing the use of alternatives for the car• Multi-modal offer (public transport, ride-sharing, micro-mobility, etc) that integrates mobility services | <ul style="list-style-type: none">• Aiming at increasing the efficiency of sustainable urban freight• Integration of interactions over logistics services• Consolidation of last-mile logistics flows• Consumer engagement |
| Platform & Technology | <ul style="list-style-type: none">• One digital access point for all mobility services: planning, booking, ticketing, etc. | <ul style="list-style-type: none">• One platform to centralize all logistics information• Dynamic pricing mechanisms that enable realistic last-mile compensation |
| Personalization | <ul style="list-style-type: none">• Mobility solutions based on the characteristics and the requirements of the users | <ul style="list-style-type: none">• Consumers' involvement in the decision-making process of the logistics services• Different delivery options offered for consumer |

GREEN-LOG Living Labs and Demonstrations

LL | Last mile Urban Logistics as a Service

- **Background**

- Small to mid-sized cities: 86.000p. (Mechelen), 101.000p. (Leuven), 260.000p. (Ghent).
- The region of Flanders has announced the ambition to introduce **zones for zero emission urban freight** in cities.

- **Challenge**

- Implement a **uniform LaaS platform** in different cities with the possibility to integrate their own policies and business rules.
- Presenting more **sustainable, data driven alternatives** to actors of the urban logistics supply chain.
- Find out how to facilitate the use of these alternatives with a toolkit of **incentives and policies**.

- **GREEN-LOG Innovation**

- Develop a **functional Logistics-as-a-Service platform** where urban logistics data is used to link **demand** (e.g. urban freight shipments, on-demand requirements, storage requirements) and **supply** (e.g. the provision of sustainable logistics services, warehouse space, need for certain type of vehicles) to improve the sustainability of city logistics.



Mechelen



Ghent



Leuven

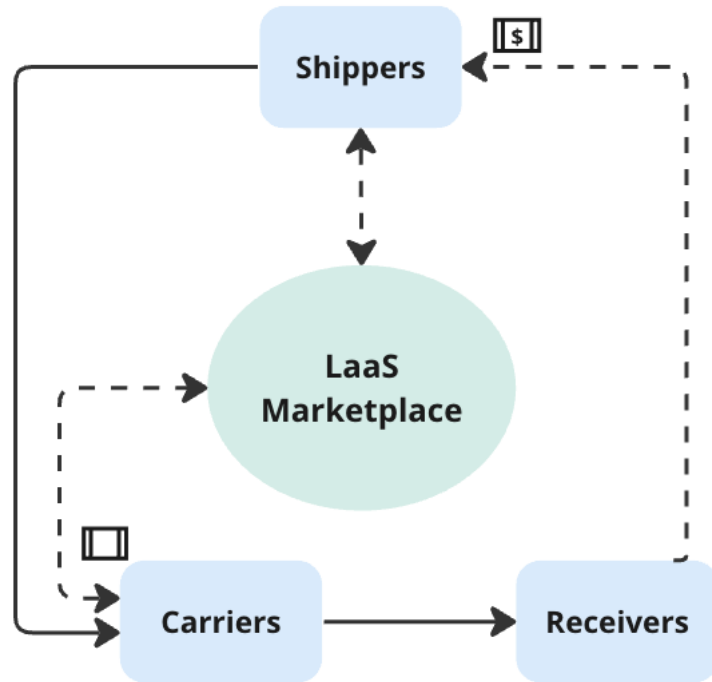


Cities located in Flanders, Belgium



GREEN-LOG & Interconnected green delivery solutions

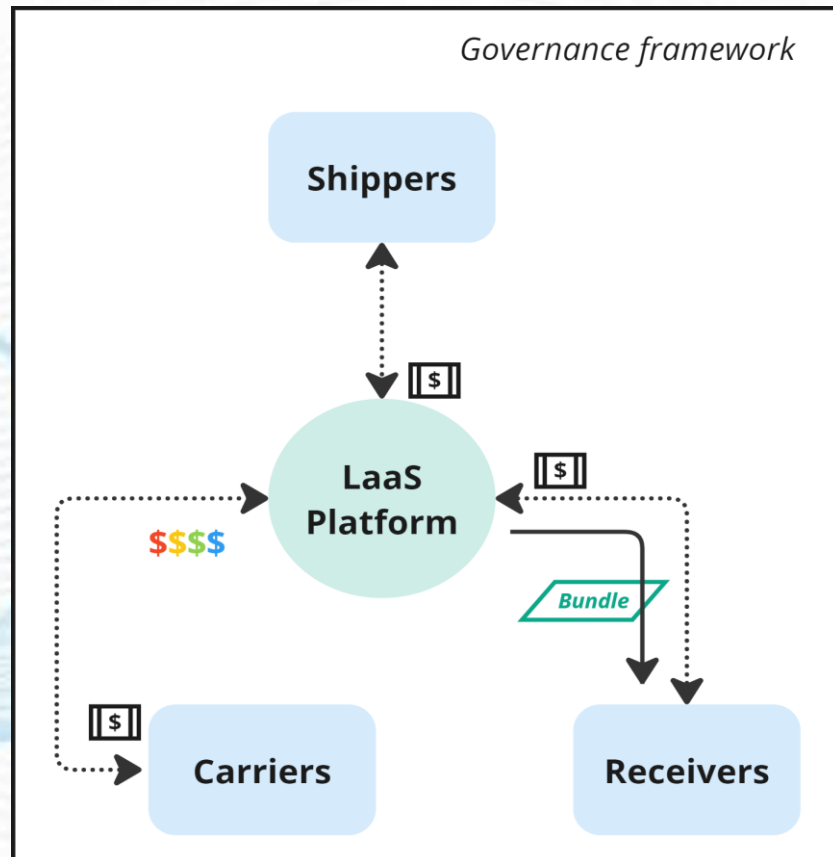
The Application of LaaS in the Flanders Pilot (the 1st run)



- Receivers initiate a shipment on local shop-owners' sites when ordering products; receivers are provided with multiple delivery options to choose receiver.
- Shippers give delivery orders on the LaaS marketplace where carriers are integrated.
- Carriers take the job on the LaaS marketplace.
- Receivers pay local shop owners for the logistics services, shop owners then pay carriers.

GREEN-LOG & Interconnected green delivery solutions

The Conceptual LaaS (could potentially be implemented in the 2nd run of the Flanders Pilot)



- Shippers give order information on the LaaS platform.
- Receivers request shipment on the LaaS platform / choose from delivery options provided by carriers on the LaaS platform based on the dynamic-pricing mechanism.
- Carriers take the job on the LaaS platform.
- Receivers communicate /make delivery adjustments directly with carriers on the LaaS platform.
- The LaaS platform may potentially promote sustainable service bundles for receivers.
- Shippers and receivers pay LaaS for the logistics service, whereas carriers are paid by the LaaS platform.

GREEN-LOG Living Labs and Demonstrations

LL | Next generation last mile delivery integrating delivery robots

- **Background**

- The 3rd largest EC site after Brussels and Luxembourg.
- Leading research campuses with many laboratories and unique research infrastructures.

- **Challenge**

- Need to develop innovative models of autonomous and multimodal delivery able to support daily activities by increasing efficiency, reducing errors, and decreasing human involvement, especially in most of the standardized and repetitive operations.

- **GREEN-LOG Innovation**

- <3y: EVs and the presence of unattended delivery systems are expected to form the first wave of vehicles that transform last-mile delivery.
- 3-5y: Large, semiautonomous delivery vehicles that follow parcel-delivery staff are expected to be the next trend to be adopted by companies in the parcel-delivery segment.
- 5-10y: ADVs will likely not need to be accompanied by human delivery staff at all and will represent the third wave of widespread tech-enabled parcel delivery.



The Joint Research Centre of EC in Ispra, Italy



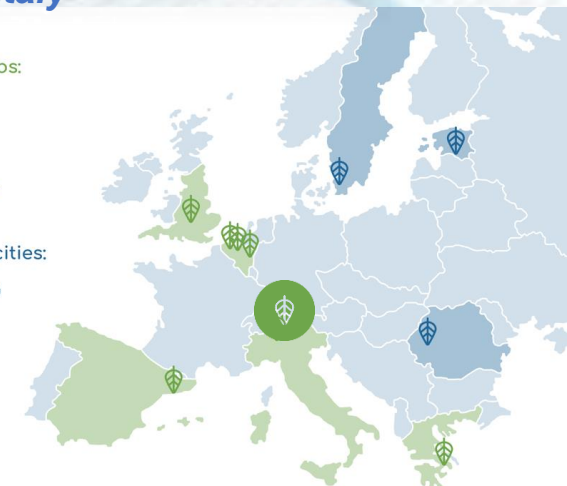
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The fleet management system i.e. Yape droids (figure) and Measy cargo bikes will be integrated with the booking system implemented in the delivery platform.

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Athens, Greece (LL#1)



Ghent



Leuven



Oxfordshire, United Kingdom (LL#4)



Barcelona, Spain (LL#2)



Mechelen

Flanders, Belgium (LL#3)



Ispra, Italy (LL#5)

GREEN-LOG Follower Cities

Three **follower cities** Arad, Helsingborg, and Valga that experience rapid economic and social change will **adopt the Transferability and Adaptability framework** developed by GREEN-LOG.



Helsingborg, Sweden

Concepts of shared MCCs and innovative technologies based on delivery bots and CAVs, relying on its advanced city-wide connectivity infrastructure.



Arad, Romania

Cooperation of logistics service providers for shared MCCs and multimodal deliveries.



Valga, Estonia

Mutli-stakeholder and cross-border collaborations and understanding of how to define policies for optimize city logistics across the Valga-Valka neighbouring municipalities.

GREEN-LOG

Thank you for your attention!


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