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GRETA

GRETA project
Final publication

GRETA project in a nutshell

Title:

Greening Regional fReight Transport in fuAs

Duration:

Start date: 04/2023

End date: 03/2026

Budget:

2,713,790.00 €

ERDF co-funding:

2,171,032.00 € (80%)

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Partnership:

Lead partner	**Institute for Transport and Logistics Foundation**	**Italy**
Project partners	City of Reggio Emilia	Italy
	University of Maribor	Slovenia
	Municipality of Maribor	Slovenia
	Łukasiewicz – Poznań Institute of Technology	Poland
	City of Poznan	Poland
	ZAILOG SCARL	Italy
	BKK Centre for Budapest Transport	Hungary
	Central European Initiative – Executive Secretariat	Italy
	European Network of Logistics Competence Centres	Belgium
	Technical University of Applied Sciences Wildau	Germany

Project objective

Aims

GRETA aimed to address the **growing impacts of urban freight transport in Functional Urban Areas** (FUAs), where increasing e-commerce activity is putting pressure on public space, air quality and traffic conditions. The project focused on **decarbonising the last-mile of delivery by testing low- and zero-emission solutions** capable of reducing congestion, noise and emissions while improving the overall efficiency of urban logistics. Through **concrete pilot actions and shared knowledge**, GRETA supported cities in rethinking how freight operations could be better integrated into sustainable urban mobility systems.

Pillars (macro-activities)

The project activities were structured around three interconnected pillars combining analysis, experimentation and policy support.

- **Analysis of urban freight needs and gaps**, through the assessment of freight delivery patterns, operational constraints and policy frameworks in the participating FUAs, building a shared evidence base for sustainable urban logistics planning.
- **Piloting of sustainable last-mile solutions**, including microhubs, cargo bikes, zero-emission vehicles and curb management measures, tested in real-life conditions to assess technical feasibility, governance models and operational performance.
- **Support to policy transition and capacity building**, through the development of guidelines, policy toolkits and training materials, fostering cooperation between public authorities, logistics operators and other stakeholders to enable replication and scaling-up of tested solutions.

Cross-border impact

GRETA generated a tangible cross-border impact by **implementing pilot actions in five FUAs across Central Europe**: Maribor, Reggio Emilia, Verona, Poznań and Budapest. Testing similar solutions in different urban and regulatory contexts allowed the project to develop **comparable approaches that could be transferred to other cities and regions**. In parallel, **transnational exchange and capacity-building activities** strengthened public authorities' competences in urban logistics planning, supporting the uptake of GRETA solutions in other urban environments.

Contribution to EU/national policies & macro-regional strategies

GRETA contributed to key EU, national and macro-regional strategies by supporting the **decarbonisation and modernisation of urban freight transport** through concrete actions implemented and tested in FUAs, as well as by **strengthening governance and planning capacities** of involved local authorities.

At EU level, the project directly supported:

- the **European Green Deal**, by promoting low-emission last-mile delivery solutions through cargo bikes, microhubs and electric vehicles;
- the **Fit for 55 package**, through measures that reduce transport-related emissions and optimise the efficiency of freight flows;
- the **EU Urban Mobility Framework**, by improving data-driven decision-making and public-private coordination to organise public spaces and reduce conflicts between freight and passenger traffic.
- the **EU Road Safety Policy Framework (and Vision Zero)**, by introducing safer vehicle types, better curbside management and traffic organisation measures that reduce conflicts between delivery vehicles, pedestrians and cyclists and contribute to the goal of zero road fatalities and serious injuries.

At national and regional level, GRETA delivered policy-relevant outputs that could be integrated into local regulatory frameworks. It also supported the **integration of urban logistics into Sustainable Urban Mobility Planning (SUMP) and Sustainable Urban Logistics Planning (SULP) processes**, providing data, Key Performance Indicators (KPIs) and practical methodologies to update plans in line with current needs and mobility patterns.

In addition, GRETA contributed to several EU macro-regional strategies (including the **Danube**, **Adriatic-Ionian**, **Baltic Sea** and **Alpine** strategies) with cross-cutting topics related to the Transport policy area by addressing shared challenges related to efficiency, sustainability and competitiveness in urban logistics. Joint pilot actions, coordinated peer-review workshops and training activities enabled mutual learning across FUAs and supported the share and potential application of tested solutions beyond the project territories.

This was also made possible thanks to the involvement of networks such as OPEN ENLoCC and collaboration initiatives like the ETP-ALICE Liaison Programme, helping to ensure long-term impact and continued cooperation beyond the project lifetime.

Approach/methodology

Gaps addressed

Across Central Europe, FUAs face a set of recurring challenges related to last-mile freight transport that hinder the transition towards greener and more efficient urban logistics. GRETA addressed structural gaps related to the organisation, governance and environmental performance of urban deliveries, which have been intensified lately by the rapid growth of e-commerce and increasing pressure on limited public space.

In particular, the project tackled:

- **limited use of more sustainable vehicles** in last-mile distribution;
- **conflicts between freight transport, passenger mobility and other uses of public** (but also private) **spaces**, especially for the curb (i.e., the section located between the road and sidewalk);
- **lack of shared data** on urban freight flows affecting both the city centre and its surroundings;
- **insufficient integration** between logistics operators and public planning processes;
- **scarcity of tested, replicable pilot cases** to support evidence-based decision-making on urban logistics at FUA level.

Needs identified

Based on joint territorial analyses and transnational exchange, GRETA partners identified common needs shared by FUAs, which are related not only to technology, but also to governance, knowledge and cooperation among stakeholders.

Key needs include:

- improving the **efficiency and environmental performance of last-mile deliveries** supporting the uptake of zero- or low-emission vehicles, such as cargo bikes and light electric vehicles;
- enhancing the **efficiency of delivery flows** to reduce vehicle kilometres, emissions and congestion;

strengthening **public-private cooperation** as well as coordination within local administrations;

- developing **comparable KPIs and monitoring frameworks** to support investments, regulatory updates and long-term planning.

Solutions proposed

GRETA adopted an integrated and transnational approach combining analysis, experimentation and capacity building. The project supported 5 central European cities in testing tangible solutions **under real-life conditions**, while ensuring their financial, environmental, and social sustainability so they would remain viable beyond the pilot phase.

Solutions tested included the introduction of **microhubs and transhipment facilities**, the use of **zero-emission vehicles for last-mile delivery** and the reorganisation of urban space through **curb management strategies**. Wherever possible, pilots built on existing infrastructures and underused assets to minimise costs and spatial impacts.

A strong focus was also placed on **governance and stakeholder engagement** through Freight Quality Partnerships and peer-review workshops that accompanied pilot implementation and fostered mutual learning, thus ensuring a higher potential of results' transferability. Knowledge generated within GRETA was consolidated into guidelines, toolkits and training materials, contributing to long-term capacity building for public authorities and logistics stakeholders.

List of pilot actions

- Curbside Management for Urban Logistics in Budapest FUA
- Microhub for Consolidated Urban Deliveries in Maribor FUA
- Transhipment Microhub for Last-Mile Deliveries in Poznań FUA
- Open and Collaborative Microhub for Cargo Bike Deliveries in Reggio Emilia FUA
- Optimised Last-Mile Delivery Model in Verona FUA

Important deliverables:

Conceptual paper on regional collaborative logistic in FUAs

This paper explores the application of a collaborative supply chain approach at regional level, with the aim of unlocking synergies among different logistics actors and increase the efficiency of the overall system.

ICT and Innovative solutions to support the greening urban freight

By synthesizing existing research, this review provides an analysis of current advancements to identify potential policy and planning solutions; Infrastructural and organizational solutions; Information and Communications Technology (ICT) driven solutions and Vehicle-based solutions.

Capacity building strategy for innovative green urban logistics in Central Europe

This deliverable seeks to empower stakeholders to embrace innovative, sustainable and more inclusive logistics practices by delivering targeted training and knowledge transfer, facilitating peer learning and cross-border knowledge exchange across FUAs.

Innovative solutions to promote synergies between passenger transport and freight transport

This deliverable explores cargo hitching, an innovative approach to improving transport efficiency and sustainability by synergically sharing infrastructure and vehicles between passenger and freight transport.

Boosting urban logistics: Improving curb management and microhubs for cargo bikes in Central Europe

This report presents a strategy to improve urban logistics in Central Europe through better curb management and the development of microhubs for cargo bikes. It aims to support the European Commission's urban agenda in line with the European Green Deal and the Urban Mobility Package.

Scan the QR codes to see the complete documents

GRETA takeaways & strategic relevance

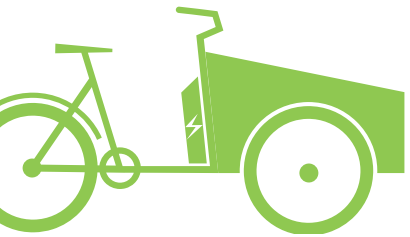
GRETA built its experience in **FUAs** that reflect common European urban conditions despite their specific locations: **dense city centres** with a high concentration of services and commercial activities, surrounding areas less involved in freight planning, **constrained road networks** and increasing competition for **limited public space**. In this context, the growth of **last-mile deliveries**, accelerated by the COVID-19 crisis, has amplified congestion, emissions and operational inefficiencies, with negative effects ranging from **urban liveability** to the declining attractiveness of city centres for local businesses.

Across different FUAs, the project showed that **sustainable last-mile logistics** can be advanced by combining **limited physical interventions**, **digital tools**, **coordinated governance** and stronger cooperation between **public authorities and private operators**. Their engagement proved essential but demanding, as continuous dialogue and **clear communication** were necessary to build acceptance and adapt solutions to specific operational needs, effectively steering operators towards **more sustainable practices**.

This approach helped translate **strategic objectives**—such as those embedded in existing **SUMP and SULP frameworks**—into **concrete actions** tested on the ground. In this process, **local authorities** played a decisive role as supporters and facilitators by **aligning internal departments**, **managing scarce logistics space** and setting **clear operational conditions**. >

> GRETA also demonstrated the value of **joint learning across borders**. Similar problems affecting city centres and peripheral areas were tackled in different national and regulatory contexts, allowing partners to **compare solutions** and adapt them to local needs. **Simple and flexible measures** proved effective when supported by **stakeholder engagement** and clear rules for the **use of public space**. Even **small-scale pilots** generated measurable environmental and operational improvements, showing that **incremental action** can support a positive transformation in the medium and long term.

Taken together, these insights showed that improving last-mile logistics is less about **new infrastructure** than about enabling the **right conditions** and **collaborative approaches** capable of unlocking efficiency. GRETA demonstrated that when **clear regulations**, **coordinated governance**, **stakeholder involvement** and **operational flexibility** are in place, cities can translate policy goals into **concrete and scalable actions** towards a **more sustainable and efficient urban logistics**, in line with **European decarbonisation objectives**.



Pilot actions

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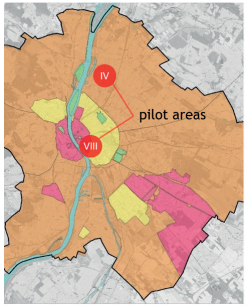
Curbside Management for Urban Logistics in Budapest FUA

Aim

The pilot aimed to develop and test a comprehensive curbside management approach to support greener, more liveable and better organised public spaces, with a specific focus on urban logistics needs. The action combined data-driven analysis with real-life pilot interventions.

Background/context

Curbside spaces - located between the roadway and pedestrian areas - are critical transition zones that accommodate a wide range of activities, from loading and parking to micromobility and public space uses. In Budapest, growing pressure on public space, irregular loading practices and limited data on curbside usage have highlighted the need for a more systematic approach. As one of the first major European city to address curbside management at metropolitan scale, Budapest used the pilot to respond to these challenges and support a more integrated, logistics-friendly and people-oriented oversight of these important spaces.



Legend

- Bank, financial services
- Other shops – toy store, bookstore
- Food, beverages
- Gastronomy – restaurant, bar, café
- Pharmacy, drugstore
- Hotel, hostel
- Office, residential building
- Cultural institution
- Clothing, footwear
- Services – optician, cosmetics
- Public administration, school, hospital

Activities

- Development of a city-wide Curbside Management Framework and Function Assessment Methodology with a data-driven and modular design.
- Extensive static function mapping and dynamic activity observation as well as implementation of stakeholders' engagement activities.
- Implementation of pilot curbside interventions in two districts.
- Introduction and monitoring of dedicated curbside functions such as loading bays for urban freight, short-term parking dedicated to citizens for quick errands, space for residential waste containers and waiting areas for food delivery cyclists.
- Monitoring, evaluation and refinement of the methodology using interventions data and dedicated surveys for shops as testing grounds for scalable solutions.

Key results

- Development of Curbside Management Framework and assessment methodology.
- Pilot interventions implemented in two districts (IV and VIII).
- Collection of detailed data on loading, parking and micromobility activities, acting as evidence supporting scalable.

Challenges & lessons learned

The pilot confirmed that limited data availability and rigid regulatory frameworks represent major barriers to effective curbside management. High competition for public space requires careful prioritisation and continuous dialogue with local stakeholders. The experience also demonstrated that data-driven methodologies are essential to reconcile logistics needs with broader urban liveability goals and to enable informed and adaptable decision-making processes.

Scan to see a video pill on the pilot action.

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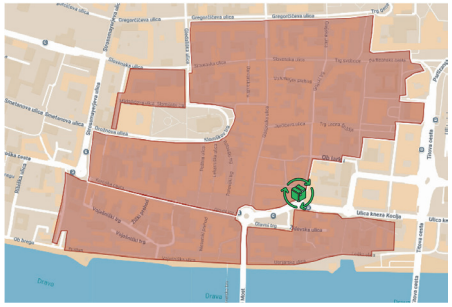
Microhub for Consolidated Urban Deliveries in the Maribor FUA

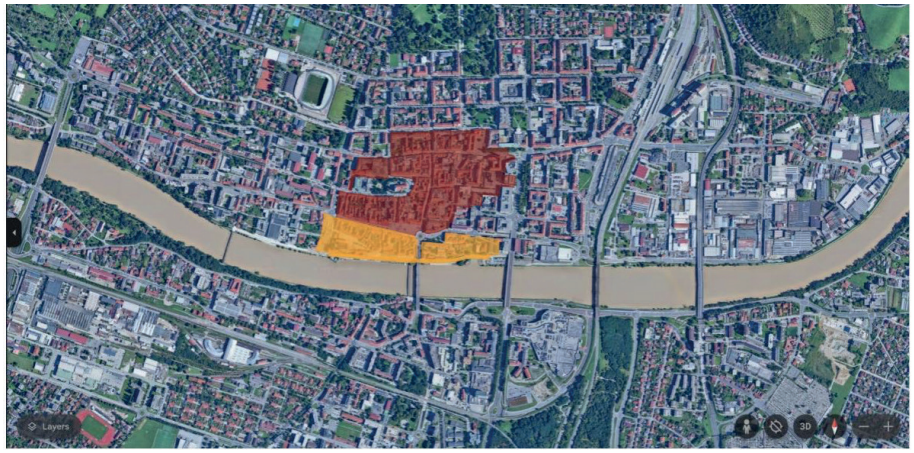
Aim

The pilot aimed to improve logistics flexibility in the city centre by introducing a modular microhub that enabled consolidated, sustainable and flexible last-mile deliveries. The solution addressed operational constraints in the pedestrian zone while maintaining high service levels for local businesses.



Background/context

Maribor's city centre is characterised by a pedestrian zone with strict delivery regulations and limited access outside designated delivery hours. These constraints, together with plans to further expand pedestrian areas, have created growing challenges for businesses reliant on regular deliveries. The pilot addressed the need for alternative delivery solutions that support economic activity while maintaining the quality and attractiveness of public space.

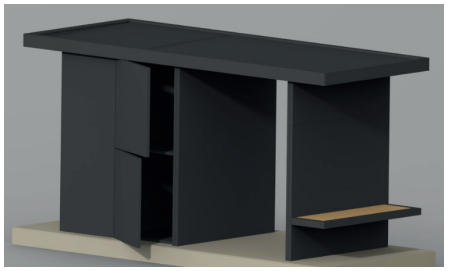


Activities

- Engagement of key stakeholders through meetings and coordination activities involving municipal departments, logistics operators and local businesses.
- Analysis of freight transport patterns and delivery operations in the FUA, with a specific focus on the pedestrian zone.
- On-site survey of 375 businesses to assess delivery needs, time constraints and operational challenges.
- Identification and selection of a suitable location for the microhub, in cooperation with urban planners and architects.
- Design and development of the microhub concept, including visual identity and operational layout, in compliance with cultural heritage requirements.
- Public procurement, installation and operational launch of the microhub, followed by monitoring of key performance indicators and evaluation of future expansion potential.

Key results

- Introduction of a zero-emission B2B delivery solution in pedestrian areas.
- Enablement of flexible, potentially 24/7 delivery operations.
- Improved logistics support for city-centre businesses.



Challenges & lessons learned

The pilot demonstrated that cultural heritage constraints can significantly limit spatial interventions in historic city centres, requiring careful design and coordination. Strong internal cooperation among municipal departments was essential to avoid conflicting decisions and delays. Continuous involvement of local businesses via Freight Quality Partnership also emerged as a key success factor, ensuring acceptance of the solution and alignment of the pilot with actual operational needs.

Scan to see a video pill on the pilot action.

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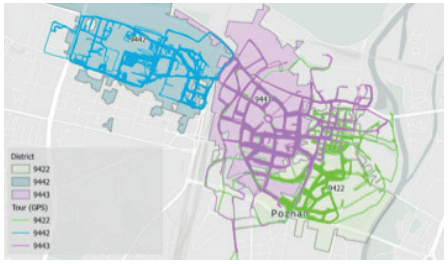
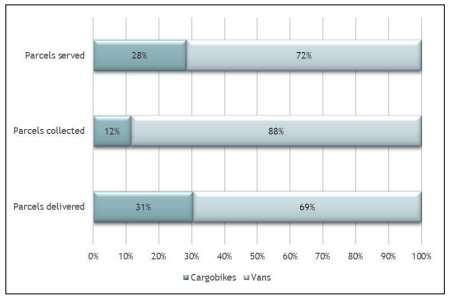
Transhipment Microhub for Last-Mile Deliveries in Poznań FUA

Aim

The pilot aimed to test the use of a transhipment microhub combined with cargo bike deliveries as a sustainable alternative for last-mile logistics in the city centre. The action explored the potential of this solution to reduce noise, congestion and GHG emissions while remaining operationally viable for delivery companies.





Background/context

Poznań, like many large European cities, faces persistent challenges related to air pollution, noise and congestion, particularly in its historic city centre, where freight deliveries play a significant role in these pressures due to narrow streets and the high concentration of commercial activities and tourists services. In view of national plans to introduce Clean Transport Zones, the pilot addressed the need for low-emission delivery solutions and explored cargo bike logistics supported by a dedicated transhipment hub as a viable alternative to conventional vehicle-based deliveries.

Activities

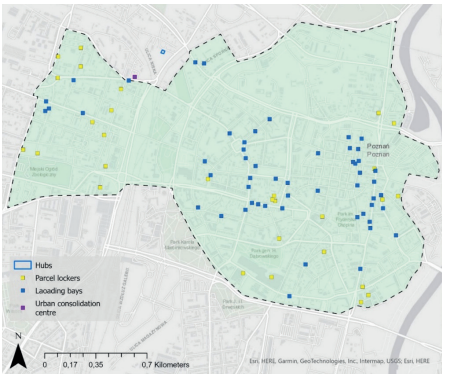
- Analysis of last-mile delivery processes in the city centre, with a focus on the potential introduction of cargo bike operations supported by a transhipment microhub.
- Modelling of cooperation between the municipality, logistics operators and other relevant stakeholders.
- Identification of a suitable pilot site and completion of the necessary administrative and permitting procedures.
- Design and development of a microhub concept adapted to local spatial and regulatory conditions and responding to identified needs.
- Testing of the solution through a six-month pilot in real operating conditions.
- Dissemination of the final microhub design solution and operational experiences to support transferability and replication.

Key results

- Nearly 30% reduction in emissions, equal to 2.57 t eCO_2 over a six month period.
- No reduction in delivery efficiency compared to conventional operations.
- Positive public and stakeholder feedback.
- Development of a scalable microhub concept applicable to other cities.

Challenges & lessons learned

The pilot revealed significant regulatory and administrative barriers, including complex permitting procedures and strict municipal rules limiting temporary structures in the city centre. Strong involvement of the municipality proved essential to overcome these constraints. Operationally, the pilot showed that sharing microhub infrastructure among multiple operators with different delivery procedures and characteristics would be crucial to maximise efficiency and utilisation of the infrastructure, reinforcing the importance of collaborative urban logistics models.



Scan to see a video pill on the pilot action.

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Open and Collaborative Microhub for Cargo Bike Deliveries in Reggio Emilia FUA

Aim

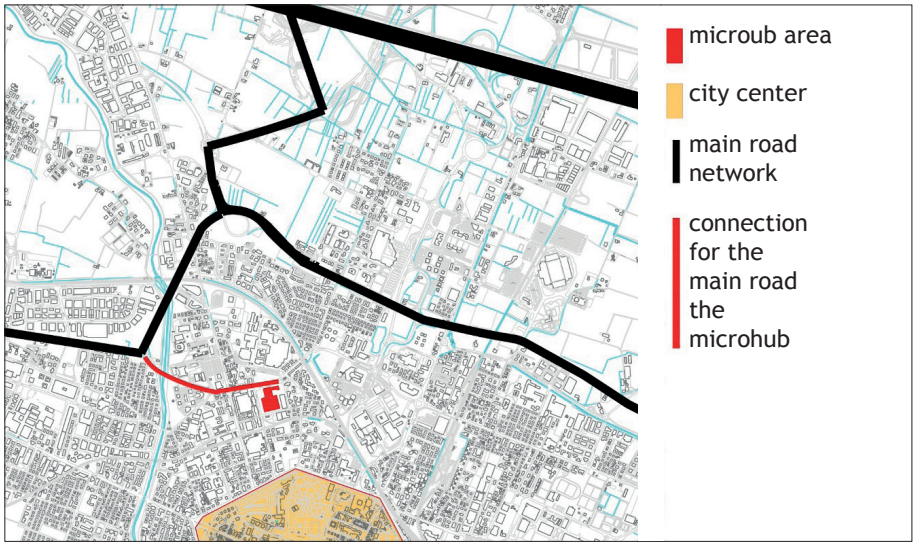
The pilot aimed to reduce the environmental impact of urban freight deliveries by promoting the use of e-cargo bikes and low-emission vehicles through an open and collaborative microhub. The facility, located near the inner city centre, allowed the transhipment and consolidation of parcels supporting the operations of multiple operators.

Background/context

Reggio Emilia has recently strengthened its regulatory framework for sustainable mobility through the approval of its Sustainable Urban Mobility Plan (SUMP) in 2023, extending the Limited Traffic Zone to the city centre that will become a Low Emission Zone. This direction is reinforced by the Emilia-Romagna Regional Air Quality Plan (PAIR 2030), aimed at reducing pollutant emissions to protect public health. The pilot addressed the need for concrete logistics solutions aligned with these policy objectives and capable of supporting operators during their adaption to these new legislation developments.

Activities

- Engagement of local stakeholders through Freight Quality Partnership meetings to define a shared vision for the pilot and its role within the urban logistics system.
- Identification of technical, operational and governance requirements for the microhub in cooperation with public authorities and logistics operators.
- Selection of a suitable location close to the city centre, balancing accessibility, operational needs and urban constraints.
- Co-design of the microhub concept with transport operators, followed by infrastructural works and a tender procedure to select participating couriers.
- Launch of the pilot and operation of the microhub, including data collection, performance monitoring and evaluation of results.
- Preparation of a long-term business plan to support future continuation and scaling-up of the solution.



Key results

- 720 deliveries performed by cargo bikes during the pilot period.
- 600 km cycled during the pilot period through cargo bikes in the inner city centre.
- Reduced emissions and noise in the city centre as well as demonstration of the operational feasibility of a shared microhub supporting multiple delivery operators.

Challenges & lessons learned

Selecting suitable microhub locations proved complex, as it required a balance between accessibility, proximity to the city centre and alignment with operators' safety and service requirements. Engaging logistics operators, especially large international companies, was also challenging and highlighted the importance of early and continuous stakeholder involvement. A key lesson is that public authorities should avoid imposing uniform operational models and instead focus on creating enabling conditions that can accommodate diverse business strategies.

Scan to see a video pill on the pilot action.

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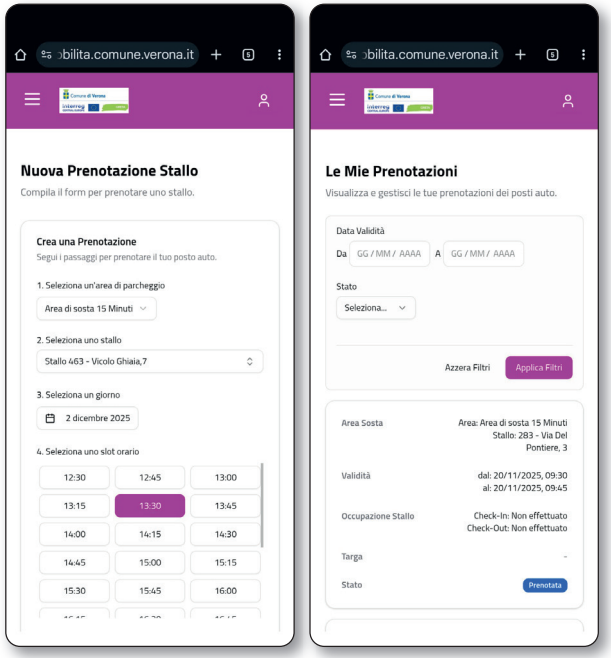
Optimised Last-Mile Delivery Model in Verona FUA

Aim

The pilot aimed to improve organisation and efficiency of urban logistics in Verona FUA by testing a digitally supported delivery model. The action introduced a system based on an app and on-street sensors to better manage loading and unloading parking spaces in the city centre, reducing congestion and environmental impacts.

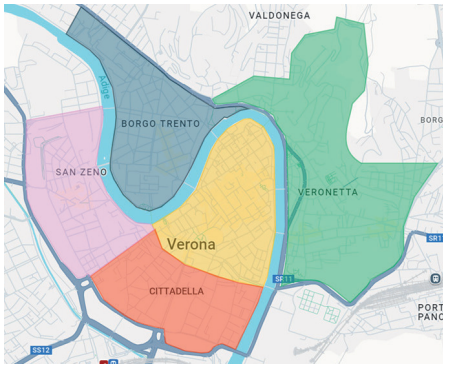
Background/context

Verona's urban area is characterised by significant freight movements towards the historic city centre, resulting in congestion, environmental pressure and inefficient delivery operations, all relevant challenges in an area with limited space and high commercial activity. The pilot responds to the objectives of Verona's Sustainable Urban Mobility Plan (PUMS), regional air quality policies and local logistics innovation strategies, addressing the need for a replicable solution capable of rationalising delivery routes and reducing time losses for logistics vehicles through improved management of loading and unloading areas.



Activities

- Definition of the Functional Urban Area perimeter and collection of baseline data on freight movements.



- Engagement of local stakeholders and co-design of the delivery model, with the involvement of logistics operators and public authorities.
- Deployment of a digital platform supported by on-street sensors to manage and monitor loading and unloading parking spaces.
- Continuous monitoring of key performance indicators during the pilot implementation.
- Final assessment of impacts and analysis of the model's replicability and scalability.

Key results

- 176 km per month saved compared to conventional delivery routes.
- Estimated reduction of 32 kg of CO_2 emissions per month.
- Improved delivery efficiency, with a 14.5% reduction in delivery time.
- Reduced freight vehicle entries into the city centre through deliveries' consolidation.

Challenges & lessons learned

The pilot demonstrated that coordinating multiple logistics operators with different operational needs is complex and requires continuous dialogue and defined shared protocols. Delivery schedules and routes needs to be adapted to real operational conditions in order to ensure effectiveness. The experience also highlighted the importance of strong communication with final recipients and confirmed that active municipal support is a key enabling factor for scaling up the solution beyond the pilot phase.

Scan to see a video pill on the pilot action.

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https://www.linkedin.com/showcase/greta-urban-logistics/?viewAsMember=true

Project Partnership

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