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EIT Urban Mobility - Mobility for more liveable urban spaces

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List of abbreviations

GDP	Gross Domestic Product
GHG	Green House Gases
KAVA	KIC Added Value Activities
MGP	Métropole du Grand Paris
SUMP	Sustainable Urban Mobility Plan
TACTIC	Tools for locAl Commerce logisTICs
VAT	Value-Added-Tax

Contents

Tables Index

Figures Index

1 Executive Summary

TACTIC proposes a transformative logistics solution for local commerce based on a collaborative approach between cities, local commerce, logistics operators and technology providers. The main objective of this project is to establish a sustainable and efficient last-mile delivery system at the city level. To achieve this, two living labs are designed and implemented in Barcelona and Metropole du Grand Paris.

This document is the first deliverable (DEL01) of the TACTIC project, the technical plan, and it presents the analysis and definition of the living lab model, a description of the three marketed innovations and the roadmap for their successful development. It also presents the knowledge transfer strategy to strengthen the pilot deployment and ensure the sustainability and scalability of the project. In summary, this deliverable presents both the definition of the product and living labs and the plan for the successful development and deployment of TACTIC.

This deliverable was developed with input from all consortium partners and started in January 2023 with the alignment of all stakeholders involved to identify key framework conditions, such as the scope of the pilot, technical and organisational implementation, within the framework of mobility and sustainability policies. Input was collected through bilateral meetings between technical partners and city partners, a city-based online survey, two online consortium meetings and a couple of face-to-face meetings among the partners to define the vision of the living lab and the deployment plan.

Furthermore, the deliverable includes an operational plan (development and deployment plan) for both TACTIC living labs and the evaluation framework to monitor the performance of the implemented solutions. The results in the form of living lab model plans are the basis for the subsequent project work packages, which makes this deliverable highly relevant for the success of KAVA. Furthermore, it represents a practical roadmap aimed at the comprehensive framework needed for the implementation of sustainable urban logistics solutions based on a collaborative approach of multiple stakeholders, in the case of TACTIC the local authorities, logistic operators, the clean vehicles sharing platform and the e-commerce platform. The main outcome is to coordinate city pilot preparations, and the product development plan, to identify the key points of progress or issues that may require a revision of the work plan.

To sum up, this document captures the joint vision of the living labs and represents the roadmap for developing and successfully implementing the three (3) commercialization products that make them possible. Following the plan set out in this document within the framework defined by TACTIC's partners will allow the development of the project in time and quality.

2 Objectives of the project

The main objective of TACTIC is to design, deploy and evaluate a sustainable and efficient delivery system for local commerce based on a multi-stakeholder collaborative approach. To achieve this, three commercialisation products will be developed (See Chapter 5) and two living labs will be used to test them in a real environment (See Chapter 3) - in Barcelona and Métropole du Grand Paris. This will enable the TACTIC consortium to develop a robust methodology for the market launch of the commercialised solutions, conduct an analysis of the key drivers with a view to replicate the delivery system in other cities and assess the effectiveness of the solution in achieving sustainability objectives.

Following, the specific TACTIC project objectives:

- Deploy green, safe, inclusive mobility solutions for goods.

- Develop three innovative products to support the transition towards sustainable urban logistics:
    - E-van/ Cargo-bike sharing platform.
    - Green logistic delivery service.
    - Green logistics integration in an e-commerce platform.
- Demonstrate the state of the art and impact of zero-emission urban logistics solutions.

- Analyse and demonstrate the potential and impact of zero-emission cargo vehicle-sharing solutions.

- Analyse the impact of an integrated e-commerce platform with multiple logistics operators.

- Study and analysis of the optimal combination of vehicle typologies to optimise logistics and maximise their associated impact.

- Define a methodology for the replicability of TACTIC' solutions beyond the project's living labs.

- Analyse the business potential of TACTIC' solutions.

2.1 Expected impact of the project

TACTIC promises significant environmental, social and economic impact, by transforming the status quo of urban logistics towards zero-emissions urban freight logistics and increasing the accessibility of local commerce to a wider market (see Figure 1). Overall, the project represents a significant step towards building a more sustainable and resilient future for urban communities. Through the development and testing of innovative delivery methods, it will help to mitigate the negative impacts of urbanisation on the environment and promote the adoption of sustainable practices in the business sector enhancing the overall economic and social well-being of the communities involved.

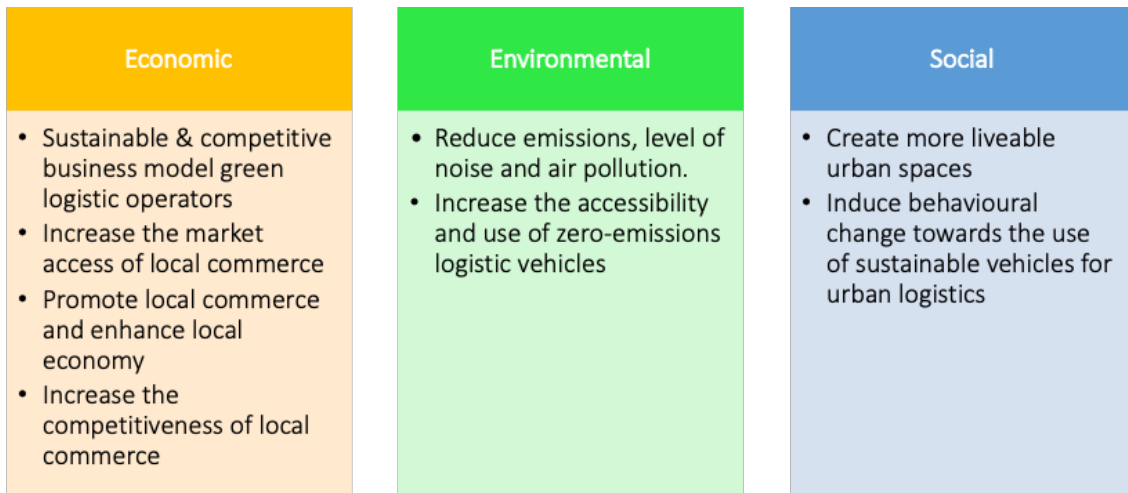| Economic	Environmental	Social
• Sustainable & competitive business model green logistic operators • Increase the market access of local commerce • Promote local commerce and enhance local economy • Increase the competitiveness of local commerce	• Reduce emissions, level of noise and air pollution. • Increase the accessibility and use of zero-emissions logistic vehicles	• Create more liveable urban spaces • Induce behavioural change towards the use of sustainable vehicles for urban logistics

Figure 1: Areas of Impact and goals of TACTIC project.:

3 Living Labs

3.1   Living Lab City of Barcelona

Barcelona is the second-most populous city in Spain, with a population of over 1.6 million people. It is also the capital and largest city in Catalonia. The city has an area of 101.4 square kilometres, making it one of the most densely populated cities in Europe (1). The Gross domestic product (GDP) of Catalonia is €229,418 million, which places it as the second largest economy in Spain by volume of GDP. From Catalonia's GDP, Barcelona accounts for more than 34% being around €84,000 million in 2021.

Logistics is one of the key industries in Barcelona, thanks to its strategic location and well-developed infrastructure. The logistics sector alone generates 5.7% of jobs and 4.6% of companies with employees in the Barcelona Metropolitan Area, and its relative weight within employment has shown progressive growth since 2014. Moreover, as of 2019, the logistics sector represents 4.6% of the GDP of the city of Barcelona and 12.7% of the GDP in Catalonia. (2)

One of the main challenges facing urban logistics in Barcelona   is the dense population and limited space available for transportation and delivery vehicles, as well as the lack of infrastructure needed to tackle all necessary services. To address this challenge, the city has implemented several initiatives and policies aimed at promoting sustainable and efficient logistics practices. The DUM (Urban freight distribution for its Spanish acronym) strategy seeks to achieve efficient, sustainable, and safe distribution of goods, thus promoting local trade and improving its competitiveness, while reducing the externalities that are generated in public space. (6)
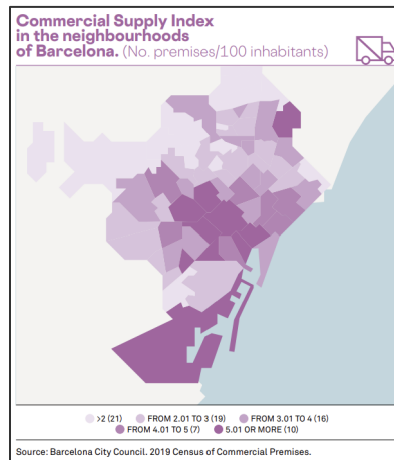

Figure 3: Commercial Supply Index in the neighbourhoods of Barcelona.

Commerce is also a significant branch within Barcelona's economic structure, with 15,983 companies and 153,351 jobs, generating more than 13% of Value-Added-Tax (VAT). The sector concentrates 20.2% of companies and 14% of employment in the city, as of the end of 2019. Additionally, the number of establishments in the retail trade was 22,010 in 2019, representing 35.8% of the premises on the ground floor of city assets. The municipal markets, with an area of 124,561 m2 and 2,072 establishments, form the largest network of food markets in Europe (3,4).

Figure 4: Trend in online shopping in Barcelona

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Data from the Barcelona City Council shows the commercial supply index in the city and the trend in online shopping in Barcelona over the years, as seen in Figure 3 and Figure 4 (5). However, one of the main challenges facing local commerce is a lack of digitalization, which limits their ability to reach new customers and obtain marketing resources. Therefore, in the past years, the city has been making significant efforts to promote local trade and encourage digitalization.

Overall, Barcelona's transportation system and logistics infrastructure position it as a key player in the global economy, attracting businesses and visitors from all corners of the world. The TACTIC project seeks to identify potential solutions to the challenges facing sustainable logistics and local commerce in the city.

City Logistics overview

Barcelona has developed between 2019-2024 the Barcelona Sustainable Urban Mobility Plan (SUMP) which sets out lines of action governing urban mobility including logistics. The initial plan for logistics focused on the need for sustainable and efficient logistics practices and encouraged the use of low-emissions vehicles and the development of micro-hubs to improve last-mile deliveries.

In the framework of the SUMP, Barcelona City Council has launched the 2030 strategy for urban freight distribution (UGD)(6). The city has analysed and developed a baseline of the current situation and the impact of urban goods distribution activity, which laid the foundations for the roadmap to be followed in the coming years until 2030. The main goals of that strategy are to boost commerce in the city, improve the economic competitiveness of businesses, improve urban goods distribution efficiency while reducing

environmental externalities, and improve the amount of public space allocated to logistics distribution and the number of accidents related to it. In order to achieve these goals, the Barcelona city council defined the following action points:

- Improve the attractiveness of drop-off and pick-up locations away from the city's downtown streets (using collection points and logistics centres and creating sustainable last-mile areas).

- Boost the commerce and the economic competitiveness of businesses in the city.

- Promote more environmentally friendly logistic vehicles and fleets, such as cargo bikes.

- Reduce traffic accidents related to logistics in the city to achieve a "Zero-accident vision".

- Promote the existence of integrated logistics land in urban areas.

- Improve the perception of citizens, establishments, and consumers with regard to this activity.

- Creation of a logistic observatory to increase awareness of government bodies and operators.

Several initiatives have already been implemented by the Barcelona city council to improve the city's logistics and transportation systems. One of these initiatives is implementing temporary windows, which designate specific time periods for the delivery of goods by medium and large-sized vehicles, allowing for greater flexibility in the use of public space (6). This encourages the use of environmentally friendly modes of transport, such as cycling logistics, changing the status quo of urban logistics.

To further support the greening of vehicle fleets, a working group with the Ministry of Industry will be established to renew the vehicle fleet and acquire electric vehicles. The General Traffic Directorate (DGT) and the Barcelona City Council (BCC) are also collaborating to approve new small vehicles for goods deliveries, such as e-scooters.

Lastly, the council is also creating an observatory to collect all information generated as part of the 2030 Strategy. This data will be available to all stakeholders, allowing them to work together to establish new proposals for action. This initiative highlights the Barcelona City Council's interests and efforts to expand its collection of data on the city, allowing them to increasingly rely on data-driven decision-making approaches.

Another significant collaboration involves the joint strategy with Mercabarna to optimise the delivery of fresh products to markets, local shops, hotels, and restaurants (6). Mercabarna is part of an Advisory Council for the Internationalisation of Logistics in Catalonia established by the Generalitat of Catalonia, the Barcelona City Council, the Barcelona Port Authority, and Consorcio de la Zona Franca. A Platform that works to improve the logistics offer in Catalonia and promote the construction of new infrastructures.

Overall, the Barcelona City Council's strategy closely aligns with the TACTIC project's objectives of promoting sustainable logistic services for local commerce. The Barcelona city council's initiatives and efforts to create new tools for logistics and transportation promote sustainability, reduce negative impacts on the environment, and support local commerce in a more sustainable way.

Local Commerce in the city

Enhancing local commerce is an essential step in supporting the economy of a community and is one of the main goals of the TACTIC project that aims to do it through efficient logistic solutions and the implementation of an e-commerce platform. By encouraging local trade, it is possible to help small businesses thrive, create jobs, and strengthen the community's overall financial health. One effective way to promote local commerce is by establishing commercial clusters, which are groups of businesses that are located close to each other and offer complementary goods and services.

- Group of shops and business located on a particular Street or block

1. Street based Commercial Clusters

- Group of shops privately owned and operated in one roof

2. Private Markets

- Group of shops centralized in one roof with publi management

3. Public markets (Municipal Markets)

Figure 5: Types of commercial clusters.

Barcelona is a city that is known for its vibrant and diverse local commerce clusters. The city has a long tradition of small independent shops, markets, and street vendors that have been serving the community for generations. According to the City Council, the city has more than 15,000 commercial establishments and local commerce account for more than 12% of the city's economy (3). The city is focused on increasing competitiveness and sustainability within municipal markets.

There are several types of commercial clustering that can be implemented in a community, see Figure 5.

As shown in Figure 5,one possible type of commercial clustering is street-based clustering, which involves businesses located on a particular street or block. Street-based clustering can create a vibrant and bustling atmosphere, which can attract both locals and tourists. This type of clustering can also benefit from foot traffic and can help enhance the area's overall aesthetic. One example of eco-friendly and sustainable commerce clusters in Barcelona is the El Born neighbourhood, which is home to several sustainable fashion boutiques, organic food stores, and eco-friendly product shops. These businesses prioritise sustainable practices and offer customers environmentally friendly alternatives to traditional products and services. One of the most popular areas for local shopping in El Bornis the Passeig del Born, a pedestrian street lined with boutiques and artisanal shops. This area is known for its unique and authentic products, and many of the shops offer locally made products that cannot be found elsewhere in the city.

Private market clusters are another type of commercial clustering that involves privately owned and operated markets. These markets can range from small-scale pop-up markets to large-scale shopping malls. Private markets can offer a diverse range of products and services, depending on the market's size and location.

Another type of commercial clustering is municipal markets or public-based clusters. These are centralised locations where multiple vendors sell their products under one roof. Municipal markets can offer a wide

variety of goods and services, such as fresh produce, meat, fish, and artisanal products. These markets are often highly regulated, and vendors are required to meet certain quality and safety standards. There are 43 municipal markets in Barcelona: 39 food markets and 4 non-food markets at the service of citizens all over the district. The list of all markets in Barcelona and their location can be found in the Table 1 and in Figure 6: Location of Municipal Markets in Barcelona (10).

Table 1: Barcelona markets.

| Food Markets			Noon Food Markets
1.La Abaceria Central	14. Poblenou	27. La Concepció	40.Dominical de Sant Antoni
2. El Besòs	15.La Llibertat	28. Felip II	41.Encants Vells - Fira de Bellcaire
3. La Boqueria	16.Sagrada Familia	29. Galvany	42. Encants de Sant Antoni
4. El Carmel	17.Sant Antoni	30. La Guineueta	43. Flores de las Ramblas
5.El Clot	18. Sant Martí	afrancs	
6.La Estrella	19. Sants	32. Lesseps	
7.El Fort Pienc	20. Les Tres Torres	33. La Marina	
8.El Guinardó	21. Vall d'Hebron	34. Montserrat	
9. Horta	22. La Barceloneta	35. Núria	
10.Les Corts	23. El Bon Pastor	36. Provençals	
11.La Mercè	24. Canyelles	37. Sant Andreu	
12.El Ninot	25. Ciutat Meridiana	38. Sant Gervasi	
13.Santa Caterina	26. Sarrià	39. La Trinitat	
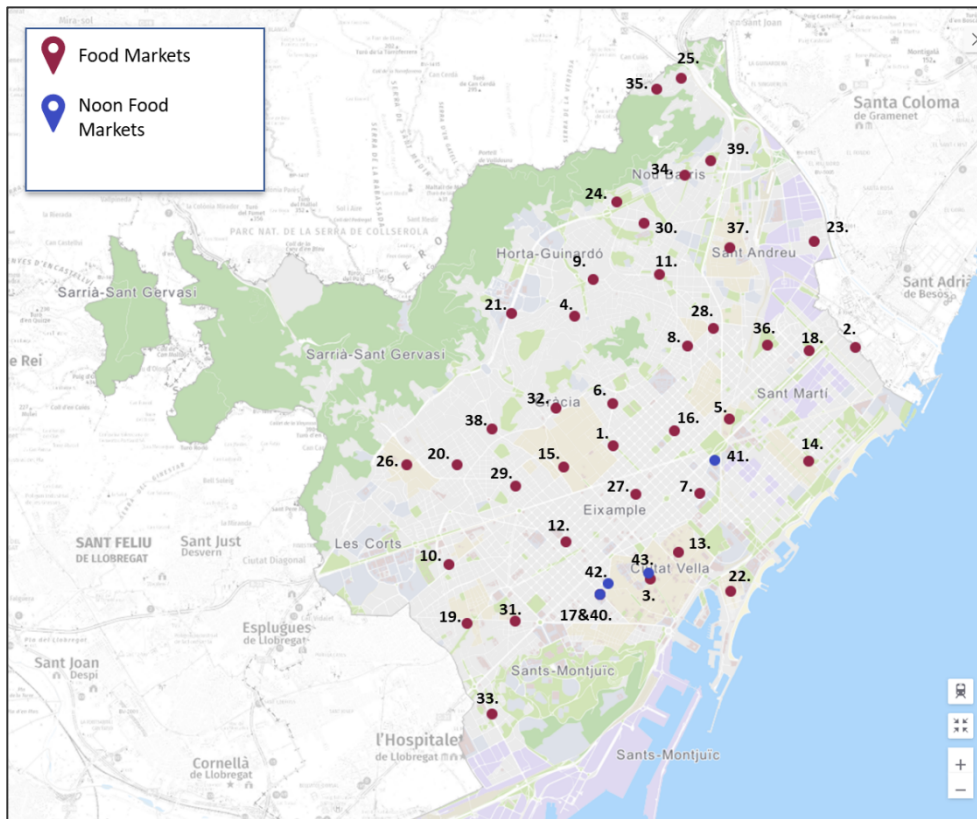
Figure 6: Location of Municipal Markets in Barcelona (10).

The Barcelona City Council has worked in the renovation and digitalisation of municipal markets over the last few years. The *Digitalisation of Barcelona's Municipal Markets Plan* (9) is composed of a set of projects that aims to respond to the values and objectives of the 2015-2025 Strategic Plan. Information technologies are integrated into the markets so not only does the modernisation of the space happen but as well an organisation and service modernisation. Some of these markets already have implemented digital, architectural and services solutions, such as digital screens in the markets and networks to inform customers about activities and promotions, online orders with pick-up points in the market, or delivery options to customers' addresses. Moreover, the municipality aims to transform the markets into sustainable spaces having seasonal and local products in bulk and consequently producing less plastic and pollution.

The 43 municipal markets in Barcelona are implementing a common online shopping platform – *mercats a un clic* (8). Right now, seven markets offer centralised home delivery services, and to support this effort, the council has installed power lines for electricity production and charging points for electric vehicles. The initiative also involves creating more electric charging points to promote the use of electric vehicles in logistics operations. With an e-commerce platform customers have the possibility of receiving their orders directly at home or, in the future, picking them up in the markets, even outside opening hours, thanks to the new agile order collection service, which is based on the installation of refrigerated lockers in the market's entrance. The new lockers will be linked to the online marketplace and can also be used to store products already purchased and keep them fresh (10).

The various configurations of grouping local commerce and markets in cities represent an opportunity for TACTIC products to be implemented, developed, and tested. The project aims to enhance local markets and commerce through digitalization, providing them with a new source of demand while offering sustainable delivery options to their customers.

Living Lab Challenges

TACTIC Living Lab in Barcelona aims to provide a sustainable and efficient logistics system that reduces the environmental impact of last-mile delivery operations and increases the accessibility of local products through e-commerce. This Living lab seeks to address the urgent need for sustainable logistics solutions and promote eco-friendly practices in the e-commerce industry. The main challenges of the Barcelona Living Lab are:

- Developed a sustainable business model for green logistics in the city:

    o Find economically viable sustainable logistics solutions for local commerce.

    o Overcome the lack of economies of scale in businesses to obtain optimal delivery rates.

- Promote the consumption of local and proximity products:

    o Breaking entry barriers for small and medium logistics enterprises in local businesses.

    o Overcome the lack of accessibility of locally sourced products.

    o Support the growth of local commerce through e-commerce.

    o Find effective ways to attract consumers to buy locally sourced products and sustainable delivery options.

- Accelerate the shift to sustainable zero emissions urban freight logistics:

    o Improve the carbon footprint of logistic processes in the city.

    o Address the need for sustainable logistics solutions in the e-commerce industry.

    o Replace traditional carbon-based transportation methods usually used in local commerce with sustainable vehicles.

Living Lab Objectives

To meet the challenges of the city of Barcelona, TACTIC's Living Lab set the following objectives with their corresponding action points (See Table 2)

Table 2: TACTIC's living lab objectives

Objective	Action points
1. Reduce carbon emissions and provide sustainable delivery options for customers in the city.	Provide electric vehicle delivery services with cargo bikes and e-vans.
2. Increase sustainability of the delivery processes in local commerce.	Integrate sustainable delivery options to the e-commerce platform for local commerce
3. Improve the efficiency of logistic chain operations.	Optimise logistic processes with multiple types of vehicles that fit the needs of the demand
4. Promote the use of electric vehicles for urban logistics	Implement an e-vehicle sharing platform for logistic operators, local markets, and citizens with e-cargo bikes and e-vans
5. Improve the quality of food delivery services.	Test green vehicles equipped with temperature control for fresh food delivery

These objectives and action points reflect the project's commitment to sustainability, innovation, and efficiency in its delivery services. By implementing these initiatives, TACTIC aims to provide high-quality delivery services while reducing its environmental impact and enhancing the local economy.

Conceptual Idea

Barcelona's Living Lab envisions an integrated package of three (3) services and solutions to boost local commerce and, at the same time, draw the path towards zero-emission urban logistics, including:

1. E-vehicle sharing platform developed by CLEM: sustainable vehicles of shared use for logistics purposes, including electric cargo bikes and electric vans, accessible for both logistic operators and the general public.

2. Green logistics operation: A logistics service, developed by Vanapedal, using exclusively zero-emission vehicles. The zero-emission logistics service is tailored to demand and aims to optimise urban logistics. On the one hand, the size of the vehicles and the type of vehicles responds to the characteristics of the product and the required logistics service. On the other hand, the design of the logistics services considers the grouping of orders, avoiding the need for one trip per order.

3. Green logistic integration in e-commerce platform: Integration of logistic services in the e-commerce platform through a logistics provider control panel.

The first product consists of a vehicle-sharing platform for electric vehicles provided by Clem which will develop and provide a sharing platform with electric vans and bikes. In the scope of the living lab in Barcelona, a fleet of e-vans will be tested. Subject to tariff agreement, at least one e-van will be rented during weekdays by Vanapedal, so they can perform their deliveries throughout the city of Barcelona. On other days, these vehicles will be offered to all users in the city, including citizens, local commerce, and other logistic operators. The vehicles will be in strategic parking spots for the logistic operator and the commercial tissue in the city, taking into account the commerce selected for the pilot test. Clem offers both B2C and B2B business models. On the one hand, their product can be directly used by individual consumers.

On the other hand, Clem also offers customised rental packages for businesses to rent their vehicles. Figure 7, shows the conceptual idea for Product 1 - E-vehicle sharing platform developed by CLEM.
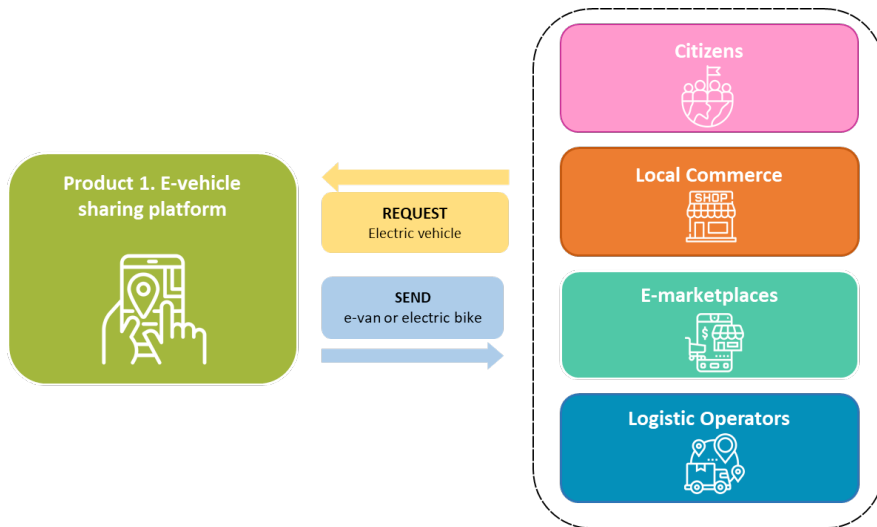
Figure 7: Clem's Product Conceptual Idea.

Product number two is a sustainable delivery service provided by Vanapedal. Vanapedal is the logistic operator and cargo bike provider of TACTIC that will manage logistics and increase efficiency by using sustainable vehicles and offering 24-hour delivery to ensure optimal routes and effectiveness. They will also test their new product, the cargo-bike Cold Box prototype, which consists of a refrigerator box for bike delivery to ensure the good quality of food items. Vanapedal will work closely with Hermeneus World to provide information about their availability in terms of time frames, so consumers can schedule their deliveries. Furthermore, Vanapedal will try to optimise its service by combining it with other delivery services from other markets they currently have or even orders from the same market not done by the e-commerce platform. See Figure 8, to see the conceptual idea for Product 2 - a sustainable delivery service, operated by Vanapedal.
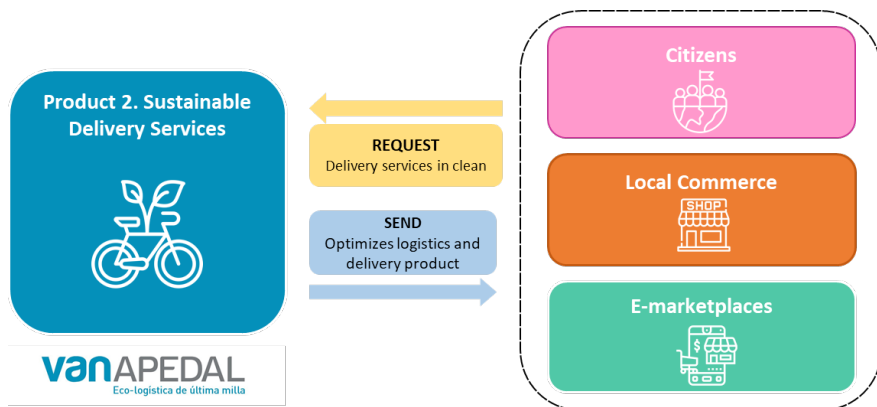

Figure 8: Vanapedal product Conceptual idea.

Hermeneus World has the third product incorporated in TACTIC, an e-commerce platform with a control panel for logistic operators. Within the scope of this project, Hermeneus World will digitise and provide an online marketplace platform for local businesses in the city. Nevertheless, their innovation on TACTIC will involve creating and testing a control panel for logistics operators. The platform will enable local businesses to increase their competitiveness and reach a wider customer base. The control panel included in the platform will provide a summary of orders and easy integration for logistic providers. Additionally, it will include a management panel that will provide information and allow the changing of order statuses. The key benefit of Hermeneus World' proposed control panel is its scalability and replicability. The control panel will be replicable, making it easy to reproduce for multiple logistics operators. The integration between Hermeneus World and Vanapedal, the logistics operator, is fundamental to the good performance of the living lab. Figure 9, shows the conceptual idea for Product 3 - E-commerce platform with logistics integration Add-on, developed by Hermeneus World.
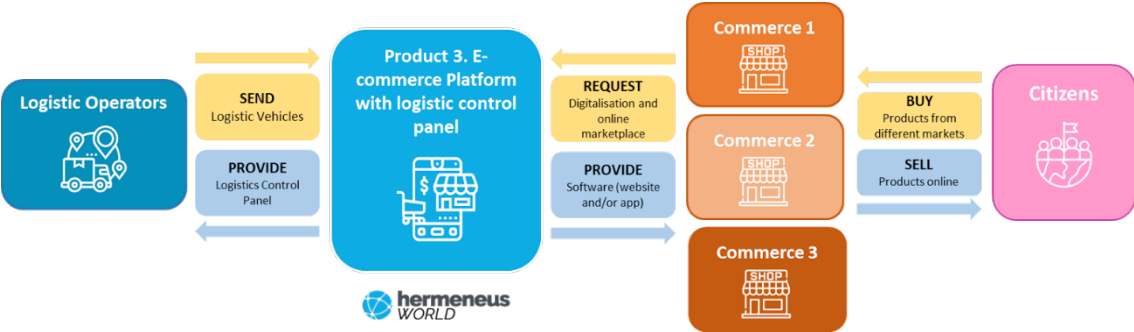
Figure 9:Hermeneus World's Product Conceptual Idea.

An integrated solution of these three products brings additional benefits for this project because it offers the markets and local commerce the complete tool with all functionalities for online orders and sustainable delivery. Figure 10, shows a scheme of the conceptual idea of the integration of the products for this Living Lab and how the products are integrated to offer to the community a digital, sustainable, and efficient order and delivery service for local commerce.
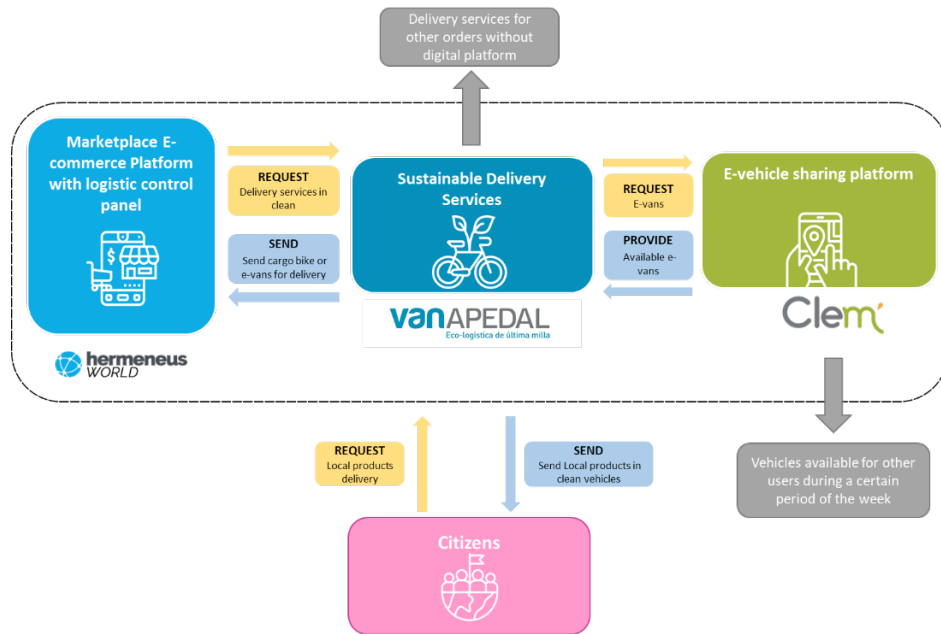
Figure 10: Living Lab Barcelona Integrated Solution Conceptual Idea.

To enhance clarity, a schematic diagram depicting the potential user journey of the integrated solution of TACTIC in Barcelona is presented in Figure 11.

The initial stage of the user is to select and order the items of the business cluster in the e-commerce platform. After the personal and delivery information is provided the payment is then done. After the order confirmation, the second stage starts with the sustainable logistic services delivering the products' order to the address of the customer. The logistics can be done with vehicles of the logistic operator fleet or with vehicles from the vehicle-sharing platform. The delivery is done and the customer is now ready to start to use or consume the products and evaluate the overall service provided.

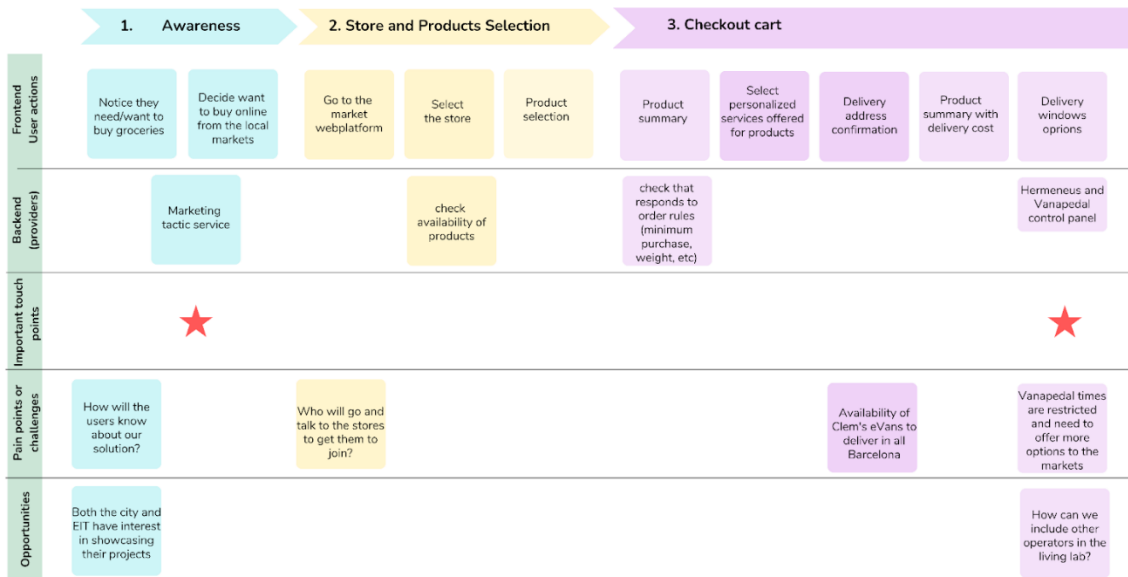In summary, the project involves numerous key stakeholders and leverages innovative sustainable transportation methods to promote locally sourced products and reduce the carbon footprint of the local commerce delivery system. The ultimate goal is to create a sustainable ecosystem that benefits the environment, local communities, and businesses alike.

Living Lab Selection Area

One of the challenges for the project is selecting the most suitable local market to launch the platform, given the diverse needs and preferences of potential users. To address this challenge, the project team has developed a set of **market selection criteria**, which will be used to assess and compare different market options and make an informed decision on the most viable and promising market for the project. In this document, we provide an overview of the market selection criteria:

- Distance of commerce cluster from cargo bike hub and charging stations: The proximity of the commerce cluster to cargo bike hubs and charging stations will have a significant impact on the efficiency of logistics operations, as well as the environmental sustainability of the project.

- Tariff and organisational considerations of the clusters: The tariff and organisational considerations of the commerce clusters, such as pricing structures, contractual arrangements, and administrative processes, will play a critical role in determining the feasibility and profitability of the project.

- Number of digitalised markets in the cluster: The number of digitalised markets in the commerce cluster will indicate the level of technological readiness and receptiveness to digital solutions, which is crucial for the success of the e-commerce platform.

- Infrastructure available in the cluster for logistic operations: The availability of infrastructure such as lockers and delivery facilities will be essential for the efficient and effective delivery of goods through the e-commerce platform.

- Openness and interest of the commercial cluster to participate: The willingness and interest of the commerce cluster to participate in the project will be a key factor in determining the level of collaboration and engagement, as well as the potential for long-term partnerships and scaling.

Based on these selection criteria there are already three municipal markets identified as potential locations for the Living Lab based on the selection criteria:

1. Mercat Santa Caterina;

2. Mercat de La Boquería;

3. Mercat del Fort Pienc.

Stakeholders map

In this section, we will be discussing the stakeholders involved in the Living Lab in Barcelona that aims to implement an e-commerce platform for local commerce with sustainable delivery options and electric sharing vehicle options. We will identify and discuss the key stakeholders, including the local government, the local business community, the logistic operators, technology and vehicle providers, and their roles in the success of the project.
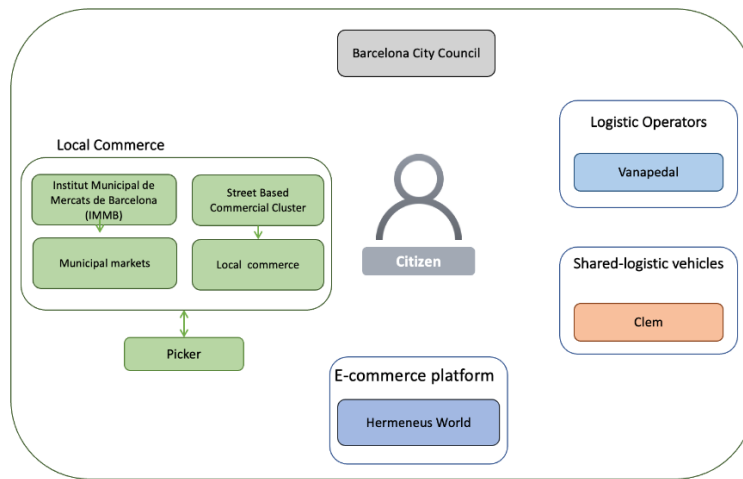
Figure 12: Living Lab Barcelona Stakeholders Map.

Understanding the interests, concerns, and expectations of these stakeholders is crucial for the project's success and will inform the project's design and implementation strategies. Figure 12, shows the main stakeholders involved in this Living Lab. Table 3 summarises the above information including the description of different stakeholders involved in the Living Lab and their roles.

Table 3: Living Lab Stakeholders and their roles in Barcelona.

Stakeholder	Role in the Living Lab
Barcelona City Council	Support the implementation of the project. Collaboration with the logistics and mobility department. Responsible for selecting the charging station and helping contact local stakeholders.
Vanapedal	Logistic operator and cargo bike provider. Responsible for managing the logistic operation and delivering the products with cargo bikes or renting an e-van.
Clem	E-vehicle sharing platform provider. Responsible for providing the shared electric vehicles that the logistics operators will use to transport goods.
Hermeneus World	Owner of the e-commerce platform. Responsible for ensuring that the platform is user-friendly for the purposes of this project.
Local Merchants	Responsible for engaging with Hermeneus World for their digitalisation and providing information about inventory and stock. They generate the logistic demand.
Street-Based Commercial Cluster	They are the association that manages the merchants and shops in the cluster. Responsible for ensuring the correct platform implementation and logistic operation in the cluster. The potential end user of Hermeneus World and Vanapedal products.
Institut Municipal de Mercats de Barcelona (IMMB)	Municipal agency of the Barcelona City Council that is responsible for managing and promoting the city's public markets.
Picker	Responsible for the picking process that involves the collection, packing, and labelling of all items and making them ready for the logistic operator's collection

Key activities and deployment plan

According to the requirements of the city of Barcelona, the needs of each stakeholder and the commercial partner, the TACTIC Living Lab Barcelona project plans to execute the following tasks:

1. **Define logistic requirements**: Vanapedal will establish the logistic requirements for the delivery and distribution of goods purchased through the e-commerce platform, including time frames, type of transports and storage.
2. **Develop and test the e-commerce platform mock-ups**: Hermeneus World will create and test prototypes of the e-commerce platform, including user interface, payment system, and order tracking.
3. **Define the business model and integration of Vanapedal and Clem:** Clem and Vanapedal need to come to an agreement on how their integration will work. They need to define the price tariff per day for the e-van models that Barcelona Municipality & CLEM will deploy in the Barcelona Living Lab. Assuming a reasonable tariff can be agreed upon, Vanapedal will rent one e-van per weekday. Other aspects of the business model (weekend rentals) need to be developed by CLEM and Barcelona Municipality.
4. **Define market selection and align with the local stakeholders:** the consortium will conduct research and analysis to determine the most viable markets for the project and engage with local stakeholders to ensure alignment with their needs and interests.
5. **Define parking and charging stations:** Barcelona City Council will identify suitable locations for parking and charging stations for the electric vehicles of the sharing platform, considering factors such as accessibility, convenience, price, and safety.
6. **Integration of logistic requirements in the e-commerce platform:** Vanapedal and Hermeneus World will work together to ensure the correct integration of the logistical requirements identified in Task 3 into the e-commerce platform.
7. **Develop and launch sustainable zero-emission parcel services using e-commerce platforms:** Vanapedal will promote the use of its own-brand parcel services with local commerce located in Ciutat Vella, offering services based initially on a model of 24h delivery city-wide.
8. **Develop and launch an electric sharing vehicle platform in Barcelona**: Clem will launch a sharing platform for electric vehicles, which will include charging stations and maintenance services.
9. **Buy and establish electric vans in the city of Barcelona**: Clem will purchase and establish a fleet of electric vans in the city of Barcelona for not only the delivery and distribution of goods but for common use in the sharing platform.
10. **Develop final e-commerce platform with control panel:** Hermeneus World will finalise and test the design and functionality of the e-commerce platform;
11. **Implementation of Living Lab**: The project will launch the Living Lab, a real-world testing environment for the e-commerce platform, electric vehicle platform, and logistics systems. The Living Lab will need to be designed and implemented in a way that is both practical and informative, enabling the project team to gather and analyse data on key performance indicators, user behaviour, and environmental impact.

The project will implement the following main milestones, with the respective individuals responsible for each:

1. Final decision of market selection – Barcelona City Council;

2. Define logistic requirements - Vanapedal and Hermeneus World team;

3. Finalise Vanapedal and Clem business agreement - Clem and Vanapedal;

4. Final decision of parking and charging stations - Barcelona City Council with support of Clem;

5. Final decision of market selection - all consortium;

6. 1st mock-up tests - Hermeneus World team;

7. Electric vans and sharing platform set up - Clem team;

8. E-commerce platform set up and launch - Hermeneus World team;

9. E-commerce platform for own-brand logistics services - Vanapedal

10. Launch Living Lab - all consortium;

11. Evaluation of living lab results - Factual and Barcelona City Council.

A project timeline diagram is shown in Figure 13,which illustrates the milestones of the project over time. This will enable all team members to keep track of their main responsibilities and ensure the project is completed in a timely manner.
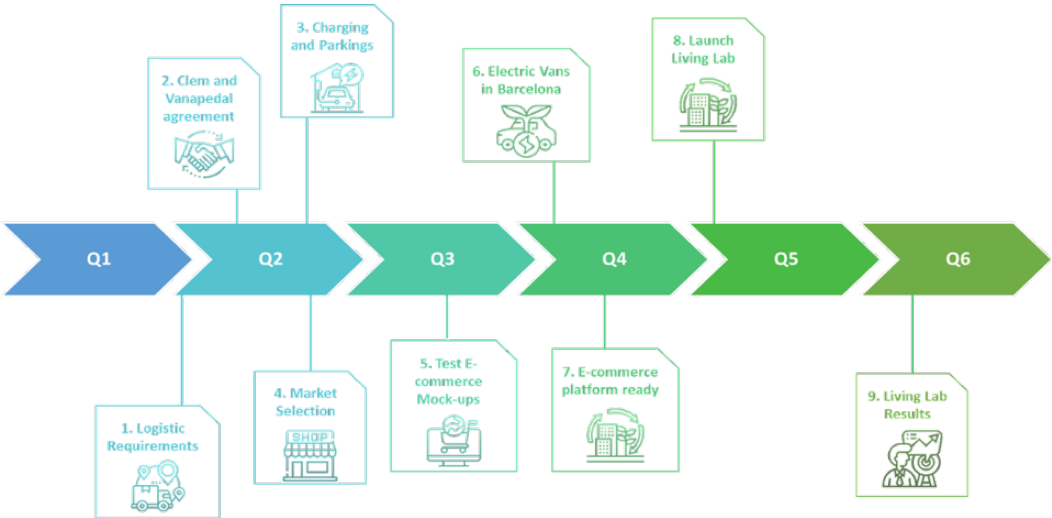

Figure 13: Living Lab Barcelona Milestones timeline by quarter.

3.2   Living Lab Métropole du Grand Paris

Define Métropole du Grand Paris is a metropole covering Paris and its nearest surrounding areas. It started in 2016 and it has a total area of 814.2 km^2. The Métropole has a population of more than 7.2 million inhabitants and it is composed of 131 communes: Paris, 123 communes in the inner-suburban area of the Petite Couronne, and 7 communes in two of the outer-suburban areas. According to data from 2021, the GDP of the Metropole du Grand Paris was approximately €714 billion, which represents around 32% of the French GDP. (11)
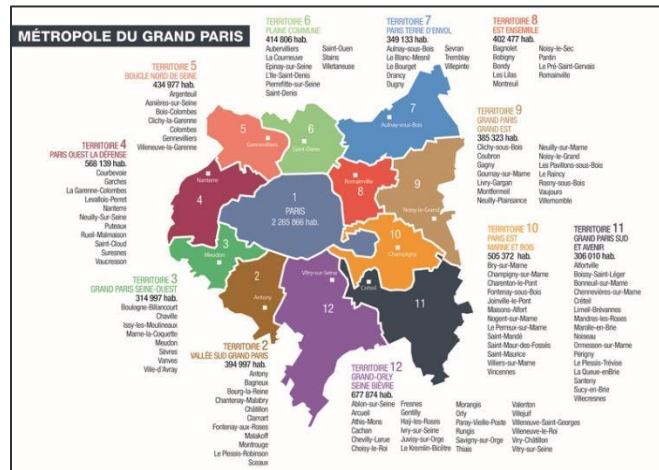
Figure 14: Métropole du Grand Paris

Since its creation, the Métropole du Grand Paris has taken concrete steps to benefit its 7.2M residents. The aim of creating the MGP was to unify the various regions that make it up and create a unified structure for managing issues of common interest, such as soft mobility, housing, and economic development. The particular role of the Metropole du Grand Paris has become undeniable, as it takes up the challenges of economic, social, and cultural development, working to protect the environment and enhancing its international attractiveness. Its action is focused on employment, investment, and innovation. As a public body of inter-municipal cooperation with its own tax revenue and specific status, the Greater Paris Metropolis exercises powers in five mandatory areas, as defined in the metropolitan program (15):

1.   Economic, social, and cultural development and planning.

2.   Environmental protection and enhancement and living environment policy.

3.   Development of the metropolitan space.

The logistics sector is a crucial component of the economy in Metropole du Grand Paris, providing significant employment opportunities and contributing to the region's economic growth through the movement of goods and services. Over 60% of goods moved takes place in the Greater Paris Metropolis area compared to Paris region. (11,14)

The Metropole du Grand Paris has made significant investments in creating low-emission zones, which aim to reduce air pollution and greenhouse gas emissions from transportation, reflecting their commitment

towards sustainable development. The plan to create low-emission zones in the Metropole du Grand Paris began in November 2018, with the adoption of the Air Energy Climate Plan, which set the goal of reducing air pollution and greenhouse gas emissions from transportation by 50% by 2030. (12)

Metropole du Grand Paris is committed to sustainable mobility and is deploying electric charging stations in the 130 municipalities within its perimeter. Eventually, 5,000 charging points will be installed, including 250 dedicated to fast charging on the streets. A strong commitment to the metropolitan recovery plan. The Grand Paris metropolitan area offers up to €6,000 to citizens for a new or secondhand EV, a benefit that can be used in conjunction with national incentives. Target of 90% electric municipal fleet in 2021 and 100% zero-emission public transportation in 2025. (12,13)

City Logistics overview

Deliveries in the Metropolitan area of Paris are becoming more frequent and challenging due to new consumption habits and tight schedules, leading to a significant impact on the road network, including congestion, pollution, and occupation of public space. In Paris, to address these issues, a regulation on transport and delivery of goods has been in force since 2007, which simplifies traffic and delivery rules and limits the circulation of the most polluting vehicles.

Recognizing the importance of urban logistics in building an innovative and resilient metropolitan area, the Métropole du Grand Paris developed a Pact for Metropolitan Logistics in 2018, comprising twelve actions to be implemented progressively. The Pact currently has nearly 80 signatories, including municipalities, territories, and urban logistics operators. (15)

To take into account these changes leading to new distribution models, and based on the Metropolitan Recovery Plan of May 2020, the Metropole du Grand Paris has built a new roadmap for metropolitan logistics and refocused on five more operational pillars for the Act 2 of the Pact (launched in February 2021): accelerating the transition of freight vehicle fleets, experimenting and implementing innovative logistics solutions within the metropolitan area, developing waterway freight transport, relocating logistics real estate in dense urban areas and steering public policy through data.

The Sustainable Urban Logistics project carries out the actions defined in *Act 2* of the **Pact for Metropolitan Logistics.**

Digital technologies, intelligent transport systems, and changing consumption patterns are driving a new stage in logistics evolution. Innovations in real estate, data, movement, and indoor logistics processes are being developed to optimise deliveries and reduce environmental impact. The project aims to harmonise regulations, optimise public space usage, integrate freight transport into public transport projects, develop river transport, and test mixed solutions.

As part of the Urban Logistics Plan, the Metropole has also validated a strategy with the Metropolitan Climate Air Energy Plan, which was definitively adopted by the Metropolitan Council on November 12, 2018. One of the priorities is the recovery of air quality. This measure does not intend to make the Métropole du Grand Paris a car-free zone but rather accelerate the renewal of the vehicle fleet, in addition to the current financial aid system. Its benefits extend beyond improving the quality of life, attractiveness

of the territory, and reduction of noise pollution. This will also have an impact on the logistics in the city and the need for new vehicle solutions for the freight of goods in urban areas.

The 131 municipalities in the Greater Paris region account for 62 % of the region's freight movements and each has its own traffic and freight delivery regulations. The goods regulations vary from one municipality to another in terms of timetables, size, and even authorised engines. (15)

Living Lab Challenge

TACTIC Living Lab in Metropole du Grand Paris aims to provide a sustainable and efficient logistics system that reduces the environmental impact of last-mile delivery operations. This Living Lab seeks to address the urgent need for sustainable logistics solutions and promote eco-friendly practices in local commerce. The main problems and challenges identified in Metropole du Grand Paris are:

- Overcome the high levels of congestion in metropolitan areas:

    o Reduce the number of delivery vehicles circulating in cities.

    o Decrease delays and travel times for drivers and commuters.

- Minimise environmental impact of the commercial and logistic sector:

    o Promote eco-friendly transportation alternatives in the trade and logistics sector.

    o Reduce the carbon footprint of urban logistics

- Implement a viable business model for an electric vehicle sharing platform:

    o Overcome the lack of infrastructure of sharing platforms

    o Find ways to attract sectors for using sharing platforms and electric vehicles.

Living Lab Objectives

The TACTIC Living Lab, located in Metropole du Grand Paris, has developed a comprehensive set of action plans and objectives aimed at improving logistics in the selected cities. The ultimate goal of this endeavour is to create a solution that enhances local commerce and environmental sustainability through the implementation of a shared electric vehicle service for local commerce, merchants, citizens, and logistics operators.

Through the provision of a shared electric vehicle service, the TACTIC Living Lab aims to improve the efficiency of logistics operations and reduce carbon emissions, thereby promoting sustainable development and enhancing the quality of life for local residents. The implementation of this solution will facilitate the transportation of goods, reduce traffic congestion, and improve the overall logistics infrastructure in the selected cities. This initiative reflects the TACTIC Living Lab's commitment to

innovation and sustainability and its dedication to fostering economic growth and community development in the region. Table 4 shows the main objectives and respective action points:

Table 4: Main objectives and action points.

Objective	Action points
1. Reduce carbon emissions and provide sustainable delivery options for customers in the city.	Implement an e-vehicle sharing platform for logistic operators and local commerce.
2. Improve the efficiency of logistics operations	Use shared vehicles for deliveries of products from a commerce cluster to end users.
3. Increase cost savings for logistics companies and local businesses.	Integrate the vehicle-sharing platform with local stakeholders and potential customers. Provide easy booking and cheaper vehicles to operate.

Conceptual Idea

The project's objective is to establish a sustainable and efficient logistics infrastructure in select cities within the Metropole du Grand Paris region. This will be accomplished by introducing an electric sharing platform for logistics, which will grant logistic operators and local businesses access to electric vehicles and cargo bikes. The introduction of this platform will significantly reduce the number of gas-powered vehicles on the road and encourage environmental sustainability.

In addition, the platform's services will encourage merchants to forego using their own vehicles for home deliveries and other logistic operations, as they will have access to the vehicles provided by the vehicle-sharing platform. This move will enhance the efficiency and economic investment in logistics, making it a win-win situation for all parties.

Metropolis, in partnership with CLEM and MGP, has already identified Rueil-Malmaison and Montrouge as suitable potential locations for the project's implementation. As an operator that deploys charging stations, Metropolis will play a crucial role in ensuring the necessary infrastructure is in place to support the project.

The conceptual model involves the creation of a vehicle-sharing platform within cities, providing users with access to e-vans and electric cargo bikes. The platform is designed to serve a variety of users, including local businesses, logistic operators, and individuals without private cars. The aim is to offer an affordable and sustainable alternative to traditional transportation methods.

Figure 15 provides a schematic diagram of the Living Lab in Metropole du Grand Paris, illustrating how the vehicle-sharing platform would be integrated into the city's existing infrastructure. The platform would be accessible through a mobile app, allowing users to quickly and easily reserve vehicles as needed. This would reduce the need for individual vehicle ownership, helping to reduce traffic congestion and carbon emissions.

The platform would also be designed to support last-mile delivery services, helping to reduce the environmental impact of goods transportation within urban areas. By providing affordable and efficient

transportation options, the vehicle-sharing platform would help to promote a more sustainable and environmentally friendly urban environment.
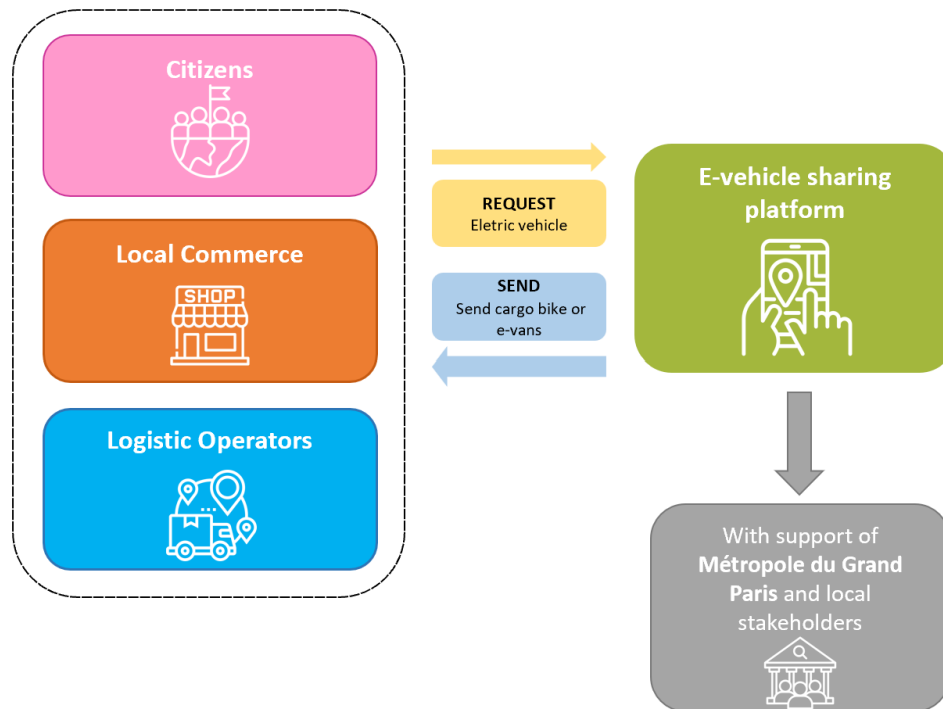
Figure 15: Living Lab Métrople du Grand Paris Conceptual Idea.

City Selection and overview

The Metropole du Grand Paris comprises 131 municipalities. It was necessary to identify the best municipalities and cities for the development, implementation, and testing of TACTIC in Metropole du Grand Paris. The selection process was rigorous and involved the evaluation of the conditions and openness of each municipality to collaborate with the project. The main selection criteria used for the evaluation were as follows:

- Municipalities located in the low-emission zone.

- Possessing a good commercial tissue.

- Visibility of the city/location.

- Availability of the required staff and stakeholders in the city.

- Availability of required infrastructures (charging stations, etc.)

- Costs of electricity and parking spots.

Based on these criteria, some cities were selected as potential areas for the implementation of the living lab, and two of them, Rueil-Malmaison and Montrouge, showed interest in participating in the project. See Figure 16 to see their location.
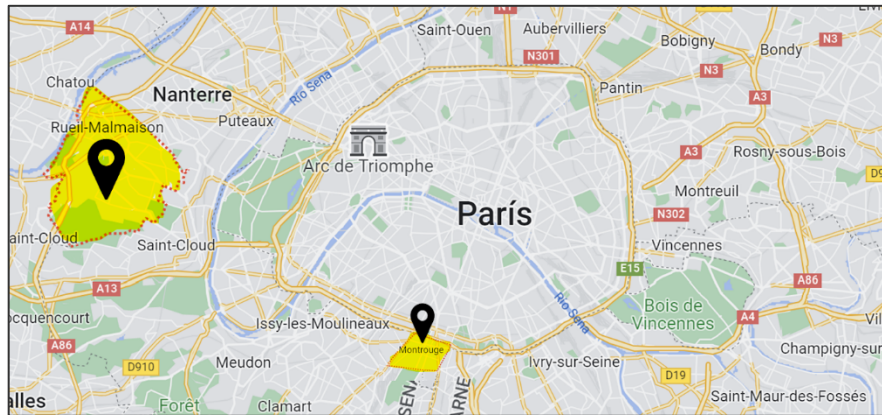
Figure 16: Metropole du Grand Paris potential areas to implement the pilot project.

Rueil-Malmaison is a commune situated in the western suburbs of Paris, France, with a population of around 81,000 inhabitants as of 2021. The city is committed to promoting sustainable development and has implemented various measures and policies to achieve this goal. These include encouraging the use of environmentally-friendly vehicles, promoting the use of shared logistics platforms, implementing a low-emission zone, developing sustainable urban logistics plans, and supporting sustainable logistics initiatives. The city has taken steps to encourage the use of electric vehicles and other environmentally-friendly modes of transportation. It has promoted the use of electric delivery trucks, bicycles, and cargo bikes, and established a shared logistics platform to reduce the number of delivery vehicles on the roads. Additionally, a low-emission zone has been implemented in the city centre, allowing only vehicles that meet specific emission standards to enter. Rueil-Malmaison has developed a sustainable urban logistics plan that includes measures to minimise the environmental impact of logistics activities. (16)

Montrouge is a suburban commune located in the southern suburbs of Paris, France, with a population of around 50,000. It is well-known for its residential neighbourhoods, green spaces, and cosmopolitan atmosphere. Last-mile logistics is a crucial aspect of the overall logistics and supply chain operations in the area. Several logistics companies and service providers offer last-mile delivery services to businesses and individuals in Montrouge, using a variety of transportation modes and technologies to deliver goods efficiently and effectively. Common transportation modes used for last-mile logistics in Montrouge include bicycles, motorbikes, and small delivery vans. Efforts are underway to increase the use of electric vehicles for last-mile deliveries, as well as bike delivery services for smaller packages. These vehicles produce zero emissions and are much quieter than traditional delivery trucks, reducing noise pollution. Furthermore, logistics companies in Montrouge are interested in using technology to optimise their logistics operations, resulting in more efficient route planning, real-time shipment tracking, and better inventory management, thereby reducing waste and improving efficiency, which in turn reduces the overall environmental impact of logistics operations. Montrouge is also located within the Low Emission Zone (LEZ) established by the city of Paris. (17)

Stakeholders map
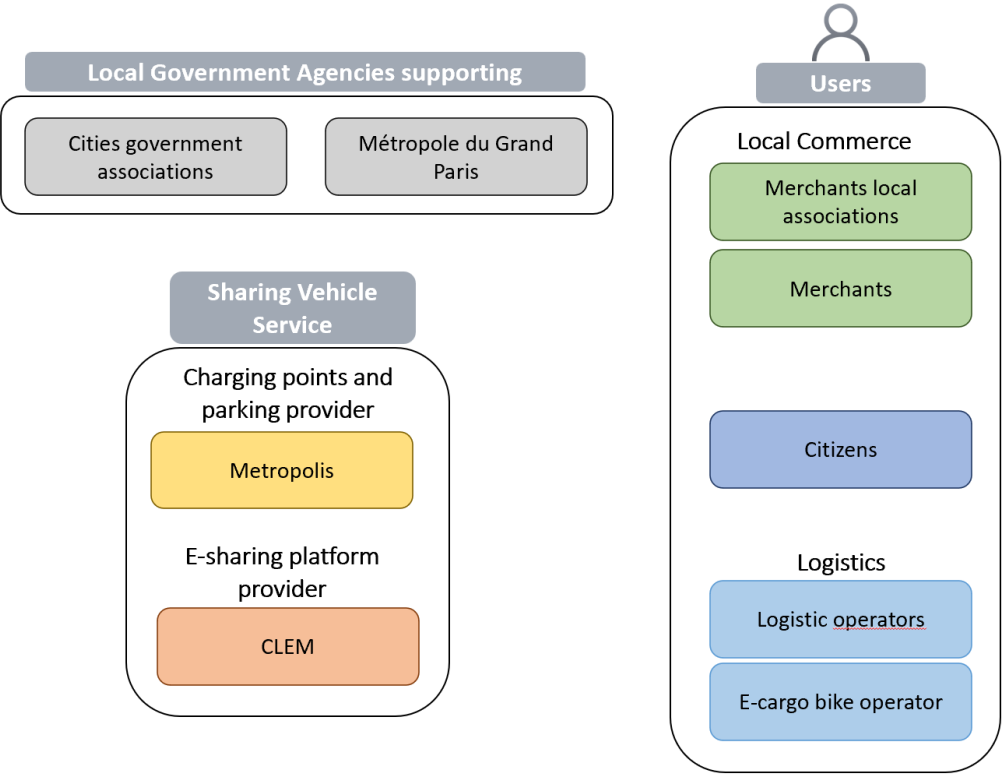
Figure 17: Living Lab Metropole du Grand Paris Stakeholder Map.

In any project implementation, it is essential to consider the various stakeholders involved, as their involvement and support can significantly impact the project's success. Several stakeholders are involved in this Living Lab, ranging from logistic operators and local businesses to customers and local government agencies. In this section, we will discuss the various stakeholders involved in implementing the electric-sharing vehicle platform for logistics and local commerce and their potential impacts on the project's success. By understanding the interests and concerns of each stakeholder group, we can develop strategies to address potential issues and gain their support for the project's successful implementation.

The stakeholder map for this project will include a wide range of stakeholders, including logistics operators, local commerce businesses, residents, local government officials, electric vehicle manufacturers, and sustainability advocates, among others. Each of these stakeholders has a unique perspective, set of needs, and level of influence that must be taken into account when planning and executing the project. For the Living Lab in Metropole du Grand Paris the following stakeholders are involved, see Figure 17.

 The local government will play a crucial role in the implementation of the electric vehicle-sharing platform project in the Metropole du Grand Paris. As a stakeholder, they will have a significant impact on the success of the project, and their involvement is essential to ensure that the project aligns with local policies, regulations, and priorities. They may also play a role in promoting the project to local businesses and residents, as well as in addressing any concerns or issues that arise during the implementation process.

The local commerce and business community also have an important role to play in the implementation of the project in the Metropole du Grand Paris. As stakeholders, they will be directly affected by the project, and their involvement is essential to ensure that the project meets the needs of the local economy. The electric vehicle-sharing platform can help to connect businesses with new customers and provide an efficient and sustainable way for them to transport their goods.

The logistic operators also have a critical role to play, as stakeholders, they will be among the primary users of the platform, and their involvement is essential to ensure that the project meets the needs of the logistics industry. Logistics operators can also benefit from the increased flexibility and scalability that the project can provide. The platform can allow logistics operators to adjust their capacity in real-time based on demand, reducing the need for idle vehicles and optimising their operations.

The charging station operator, in this case, Metropolis, is the organisation responsible for developing and managing the charging infrastructure, they will play a critical role in ensuring that the electric vehicles can be charged reliably and efficiently. They will need to work with local government officials and the sharing vehicle platform provider to identify suitable locations for charging stations and to ensure that the infrastructure meets the needs of the project.

Clem is a key stakeholder, as the organisation responsible for the development and management of the platform, they will play a critical role in ensuring that the platform meets the needs of all stakeholders. The platform provider will be responsible for developing and maintaining the technology infrastructure necessary to support the electric vehicle-sharing platform. This includes developing the software for managing vehicle reservations, tracking vehicle usage, and handling payments. They will also be responsible for managing the maintenance and repair of the electric vehicles, as well as providing customer support to users of the platform. To ensure the success of the project, the sharing vehicle platform provider must work closely with other stakeholders, including local government officials, logistics operators, and local commerce businesses.

The Table below summarises the above information including the description of different stakeholders involved in the Living Lab and their roles.

Table 5: Living Lab Stakeholders and their roles in MGP.

Stakeholder	Role in the Living Lab
Métropole du Grand Paris	Support the implementation of the project. Collaboration with the logistics and mobility department. Responsible for selecting the pilot area and helping contact local stakeholders. Responsible for the communication in the cities, the local businesses and merchants. Responsible for the pilot evaluation.
Cities government associations	Responsible for ensuring that the project aligns with local policies, regulations, and priorities. Also, for promoting the project to local businesses and residents.
Clem	Responsible for developing the website and app and providing the shared electric vehicles.
Charging Station operator	Responsible for developing and managing the charging infrastructure.

Stakeholder	Role in the Living Lab
Local Business	As users of the platform it is important to be involved to ensure the project meets the needs of the local economy. The project provides them with a way to connect their businesses with new customers.
Merchants Association	Association of clusters of merchants and shops. Responsible for promoting the platform among their shops and merchants.
Logistic Operators	Primary users of the platform. Their involvement is essential to ensure that the project meets the needs of the logistics industry. Logistics operators will benefit from increased flexibility.

Key activities and deployment plan

According to the requirements of the two cities of Metropole du Grand Paris, the needs of each stakeholder and the commercial partner, the TACTIC Living Lab Metropole du Grand Paris plans to execute the following tasks:

1. **Define cities for the pilot:** The selection of the most suitable cities for the pilot will depend on a variety of factors, such as location of Metropolis charging stations, being located in a low-emission zone, possessing a good commercial tissue, having an operation visibility location, availability of the required staff and stakeholders.

2. **Align with local stakeholders in the cities:** To ensure the success and relevance of the pilot, it will be essential to engage and collaborate with key local stakeholders, such as logistic operators, cargo bike providers, merchants, and municipalities. This will help to identify and address the specific needs and challenges of each city, as well as to build trust and support for the project.

3. **Define parking and charging stations:** The availability and accessibility of parking and charging stations will be critical for the effective and efficient operation of the platform. The project team will need to work closely with local authorities and infrastructure providers to identify and secure suitable locations for these facilities.

4. **Implement and adapt vehicle sharing platform based on the city's needs:** The platform will need to be adapted and customised to meet the specific needs and preferences of each city, taking into account factors such as parking locations, delivery routes, and user behaviour, for example, how the cargo-bike can be parked.

5. **Implement Living Lab in Metropole du Grand Paris:** The Living Lab will be a crucial element of the project, providing a real-world testing environment for the platform. The Living Lab will need to be designed and implemented in a way that is both practical and informative, enabling the project team to gather and analyse data on key performance indicators, user behaviour, and environmental impact.

The project will implement the following main milestones, with the respective individuals responsible for each:

1. Final decision of city selection - MGP;

2. Final decision of parking and charging stations - MGP with support of Metropolis;

3. Launch Vehicle Platform for the cities - Clem;

4. Launch Living Lab - Clem and MGP;

5. Evaluate Living Lab results - Factual and MGP.

A project timeline diagram is shown in Figure 19,which illustrates the milestones of the project over time. This will enable all team members to keep track of their main responsibilities.
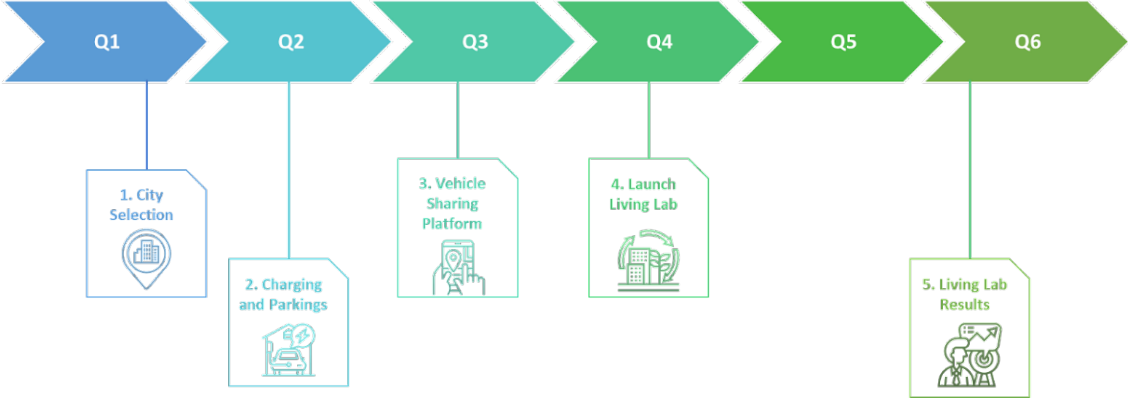
Figure 19: Living Lab Metropole du Grand Paris Milestones timeline by quarter.

4 Knowledge transferability strategy among Living Labs

TACTIC project aims not only to create and develop new tools for local commerce logistics but also to reinforce the knowledge transferability between the two Living Labs. Knowledge transferability strategy is a crucial aspect of the success and long-term sustainability of TACTIC.

The knowledge transferability strategy has two main components: internal and external. Internal knowledge transferability involves sharing knowledge, challenges, and best practices between the two Living Labs. External knowledge transferability refers to disseminating knowledge to other cities and stakeholders not included in the project. Figure 20 illustrates the two different approaches to TACTIC's knowledge transferability strategy.

Knowledge transferability

Internal
Share knowledge, challenges and best practices between the two cities in the project.

External
Dissemination of project results in conferences, events, website and social media.
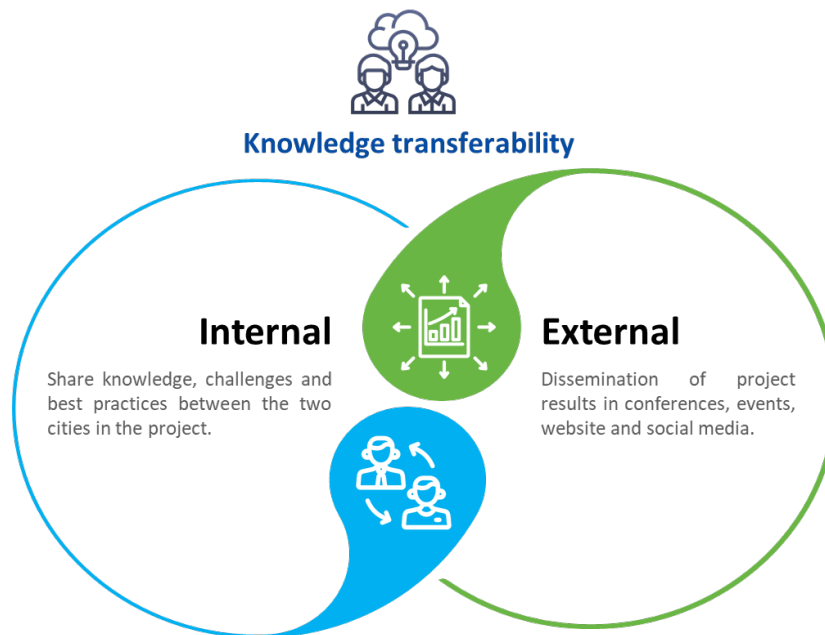
Figure 20: Knowledge Transferability Strategy

Living Labs are collaborative and interdisciplinary and innovation environments, where real-life experimentation is carried out in a specific geographic area or domain. Living Labs have the potential to be the catalyst for the transformation of the urban ecosystem and the development of sustainable urban environments. In the context of Living Labs, where cities are involved in promoting sustainable practices, a strategy for sharing knowledge and best practices becomes even more critical. In this report, it is proposed a strategy for internal knowledge transferability among Living Labs, focusing on promoting synergies between the cities involved in the project.

One essential aspect of the strategy is to organise meetings between the cities to exchange and discuss information about key aspects of green logistics and enhance local commerce in the city. These meetings should focus on exchanging information and discussing key aspects of green logistics and enhancing local commerce in the city. Topics such as electric charging and parking stations, vehicle regulations, and city strategies should be discussed to identify best practices and areas of improvement. By doing so, the cities can benefit from each other's experiences and knowledge.

To ensure effective knowledge transferability, the meetings between the Living Labs should be designed to occur both online and in person. Online meetings will facilitate the exchange of information, while in-person meetings will enable participants to have first-hand experiences of the implementation of Living Labs in the respective cities.

It is planned to organise some of these meetings during the Living Lab Design and Planning phase to facilitate knowledge sharing and possible partnerships for the project's implementation between the cities. These meetings will serve as an excellent opportunity to discuss and exchange ideas on critical aspects. To solidify relationships and collaborations, a final meeting should be held in both cities during the implementation of the Living Labs. This will provide an opportunity to witness the impact of the Living Labs and further strengthen collaboration. During this final meeting, participants can take a first-hand look at the Living Labs' implementation, which will provide insights into how sustainable practices can be effectively implemented in different urban contexts. Participants can also discuss the challenges and issues that may arise during the implementation of the Living Labs and develop practical solutions to overcome them.

Finally, the outcome of these exchanges, meetings and living lab results will be captured in the DEL09 *Demonstration Report of product* which can serve to other cities as handbook of best practices for cities regarding sustainable logistics, e-commerce, and the impact on local commerce. This deliverable will be published in TACTIC website and can be shared with other cities globally to promote sustainable urban development and facilitate the transfer of knowledge between cities.

One effective way to implement external knowledge transferability is through events and conferences. Presenting the project at relevant events and conferences such as POLIS provides an opportunity to share the results and lessons learned with a broader audience. This can help raise awareness about the project and promote best practices that can be adopted by other cities or stakeholders. Another way to do it is through the project website that documents the process, outcomes, and best practices that can serve as a repository for project knowledge. Social media platforms like Twitter, and LinkedIn will be used to promote the project and engage with interested stakeholders. These online platforms will be used to facilitate discussions, share updates, and connect with other cities or stakeholders interested in the project.

In conclusion, a knowledge transferability strategy is essential for sharing best practices and enhancing collaboration between cities involved in a Living Labs project. By creating synergies, holding regular meetings, and capturing best practices in the DEL 09 *Demonstration Report of product*, cities will have an opportunity to promote sustainable urban development and improve the quality of life for their residents.

5 Evaluation and Impact

In the following chapter will describe the overall evaluation framework, then explain the key performance indicators (KPIs) for each living lab, and finally explain the data collection and evaluation strategy.

5.1 Evaluation Framework definition

An evaluation framework was developed to understand the degree of success of the TACTIC project implementation and the effectiveness of the marketed innovations in achieving the project objectives in the two living laboratories: Barcelona and Métropole du Grand Paris.

The TACTIC evaluation framework is designed on three levels (See Figure 21):

1. **The TACTIC product.** This component aims to analyse the performance and operation of the Living Labs solutions. It includes an analysis of the functionality and usability of the technology, the usage and performance of the pilot infrastructure (i.e. the charging station) and the evolution of the usage of the two Living Labs.

2. **User satisfaction.** This component aims to measure the acceptability and level of satisfaction of the TACTIC solutions by the end user and other direct stakeholders.

3. **General wellbeing.** The last component will focus on the long-term goals of the living labs. It includes an analysis of the environmental and economic impact and potential of the TACTIC project.
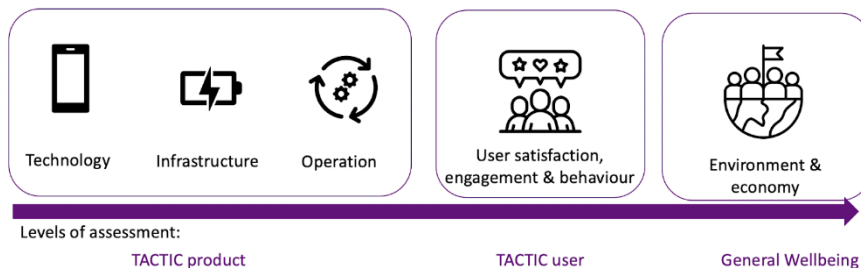

Figure 21: TACTIC's evaluation framework

5.2 KPIs and success criteria

To measure the success of TACTIC projects and products, a comparable and comprehensive set of key performance indicators (KPIs) has been defined for each Living Lab (see Table 6), which will be measured at different points in the project's development.

Levels of Assessment	KPI	Goals	Units of measurement	Type	Data source	Living labs BCN	Living labs MGP
TACTIC product operation, technology and infrastructure	Increase sustainable delivery services in the e-commerce environment	Determine whether the integration of e-commerce and sustainable logistics is attractive to the end-user.	Number of purchases with green-delivery services evolution during the pilot per type of vehicle	Quantitative	Hermeneus World App	X	
		Determine whether green logistic services are attractive for local commerce deliveries	Number of delivery services in zero-emission vehicles	Quantitative	Vanapedal' platform	X	
	Increase the number of kilometres travelled in zero-emission vehicles	Determine whether the availability of zero-emission shared vehicles and delivery services increases the number of sustainable vehicle kilometres travelled.	Vehicles type over time	Quantitative	Clem' App	X	X
			Number of kilometre travel in evans & e-cargo bikes	Quantitative	Clem' App	X	X
	Optimise the use of vehicles for urban logistics	Identify the evolution of reservations of zero-emissions vehicles for logistics	Number of shared-vehicles reservations	Quantitative	Clem' App	X	X
		Identify the patterns of usage of zero-emission vehicles for logistics	Average usage time per type of vehicle	Quantitative	Clem' App	X	X
User satisfaction, engagement, behaviour	User acceptance	Identify if the technological solution is a viable solution and understand user requirements	User satisfaction level per product	Qualitative	Clem' App , Hermeneus World App, Vanapedal' platform	X	X
			Users feedback	Qualitative	Interview/Survey	X	X
	Increase user engagement	Identify the level of attractiveness of TACTIC solutions for new users	New users in the application	Quantitative	Clem' App , Vanapedal' platform	X	X
		Identify recurrent users as a proxy of level of engagement	Tactic products recurrent users	Quantitative	Clem' App , Hermeneus World App, Vanapedal' platform	X	X
General wellbeing	Reduce C02 emissions	Measure the reduction of C02 emissions and its potential scalability	C02 emissions avoided	Quantitative	Estimated based on the kilometres travelled	X	X
	Reduce the number of vehicles used for logistics	Measure the impact of the solution in the number of vehicles used for urban logistics	Trips per vehicle	Quantitative	Clem' App , Hermeneus World App, Vanapedal' platform	X	X
	Enhance local commerce	Enhance local commerce	Number of commerces joined to TACTIC delivery services	Quantitative	Hermeneus World App	X	

Table 6: TACTIC Living Lab KPIs

6 TACTIC solutions & innovations

6.1 Marketed innovation: e-Vans sharing for logistics and e-cargo bikes sharing platform

Clem' is an innovative French company established in 2010, specialised in "shared ecomobility". An expert in electric vehicle carsharing and combined smart charging, Clem' develops innovative and comprehensive shared mobility services locally. Its technology can turn every charging point into an intelligent mobility station to develop a clean mobility complementary to public transport and committed to energy transition. Its web and app platform, Clem.Mobi is the only one to gather Electric Vehicle (EV) car sharing with integrated carpooling and EV charging with a reservation solution within a single interface. Clem's mission is to share its clients' EVs and manage their charging stations to optimise carbon footprint and offer sustainable local mobility.

Today Clem is present in over 100 towns, 10 housing projects and 30 companies in France. Operating 500 charging points and 400 electric cars in France, Clem is a leader in electric carsharing. It's open and flexible technology, enables Clem to integrate any kind of charging station and of EV within its platform.
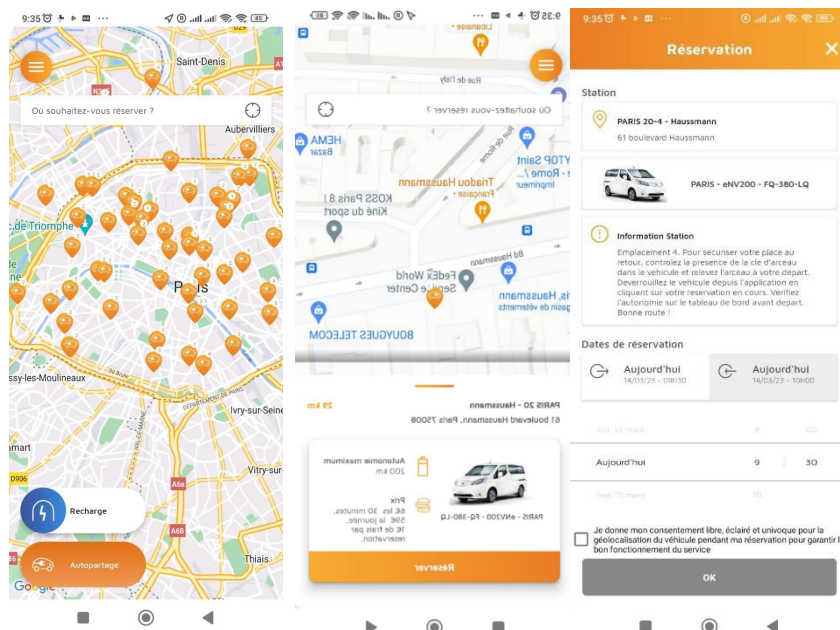

Figure 22: CLEM.Mobi App

Clem's clients include companies, shared housing blocks (social housing landlords and eco-districts), and peri-urban and rural communities (with between 2,000 and 300,000 residents). Our clients share the ambition of deploying mobility services to simplify the daily lives of their users.

As part of the project, Clem' will address urban logistics through the sharing platform in different markets in Paris and Barcelona and will integrate cargo bikes for the first time into the platform. CLEM will lead the tasks on the Living Lab pilots setup, operations and evaluation and develop the Business models and scalability strategy. Moreover, Clem will also contribute to the rest of the tasks and cooperate with the other partners.

Platform development	2023												2024					
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 1: Functional Definition	■	■																
Task 2: Creation of different screens for Android, IOS, and web		■																
Task 3: Development (API, Web Interface, Android, IOS)			■	■	■	■	■											
Task 4: Testing and Quality Assurance (for Web/android/IOS)			■	■	■	■												
Task 5.1: Integration of first stations in interface				■	■	■												
Task 5.2: Integration of stations in Barcelona							■	■	■									
Task 6.1 : Defining the processing model to extract KPIs										■								
Task 6.2 : KPI analysis											■	■	■					
Task 6.3: KPI processing and analysis												■						
Task 6.4: Release of the first set of KPIs													■					
Task 7: Modification, continuous improvement of the platform														■	■	■	■	■

CLEM Launch in Barcelona

Value proposition: product and services identification

Clem proposes placing one hand e-vans in stations that are accessible to logistics professionals, merchants, and inhabitants wishing to carry bigger sized goods (ex: furniture); and e-cargo bike for the same targets that wish to carry goods with less than20 kgs and under 0,5 m3. Both e-vehicles will be accessible through all in hand application: clem-mobi.

Vanapedal will be the logistics operator, taking the vehicles from Monday to Friday through a Guaranty formula. Furthermore, the vehicles will be available for merchants and inhabitants through a Flex formula. Also, Vanapedal can use other vehicles that haven't been booked for the week through a Guaranty Formula upon Flex formula and depending on availability.

The Hermeneus World platform will display and promote the offer of vehicles both without driver and with driver (Vanapedal). The station(s) will be ideally located under or very near the chosen markets.

aThe location of the stations in Barcelona will be based nearby three main markets:

- Santa Caterina;
- Mercat del Fort Pienc;
- Mercat de la Boqueri.

Of which both Hermaneus World has subscriptions with merchants and Vanapedal operates. The back office of Hermaneus will be used for the logistics operators. End user asks for a delivery option. Merchants and Operators can book e-vans or cargo-bikes through Clem's platform.

For Barcelona pilot, the management and maintenance of electric vehicles will be discussed by Barcelona Municipality, Vanapedal and Clem. The integration involves linking Hermaneus with Clem through a banner on the platform when asking for a booking and direct link to Vanapedal's back office when asking for a delivery.
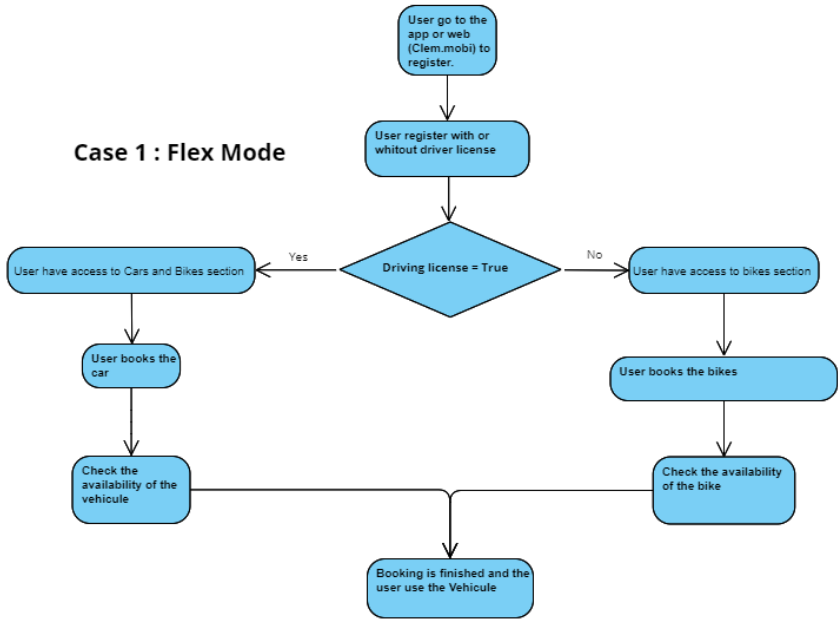
User journey

1st case is the Flex Mode:

Figure 23: Case 1 Flex Mode

Table 7: Case 1 Flex Mode

Case 1: Flex Mode	
Title	User register to the app with a flex formula
Pre-conditions	Non
Input	Non
Output	User is registered and can book a vehicle

Development plan, roles and responsibilities

Clem will take responsibility for providing a multimodal shared station for last-mile logistics; providing an APP for booking which will be added a full section for e-cargo bike sharing. Operators of cargo bikes will be invited to share their cargo bikes when they are not in operation (ideally during weekends). This multimodal solution will be complementary service to Hermeneus World when proposing theirs services through tenders to local municipalities.

The e-vans and cargo bikes will be put on stations in October and the demonstrator will run from November 2023 to May 2024. To facilitate the KPIs measure it was decided that CLEM will support TACTIC with Cargo-bikes. For the initial phase of the programme the number of vehicles given by CLEM will be: two cargo-bikes and two vans. Afterwards depending on the demand adjustments can be made to these numbers.

Table 8: Barcelona Living Lab vehicles.

	Vans	Cargo-bikes
Barcelona Living Lab	2	2

Barcelona living lab	2023												2024					
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 1: Station Definition and Selection		■	■															
Task 2: Contract Writing and Procurement 2.1 Contract writing 2.2 Procurement of e-van and cargo bikes 2.3 Procurement of other necessary elements for the stations				■	■	■												
Task 3: Station Integration 3.1 Integration of ERP for the stations 3.2 Integration of physical stations										■								
Task 4: Vehicle Deployment and Operation 4.1 Deployment of first 2 vehicles and 3 e-										■	■	■	■	■	■	■	■	■

Barcelona living lab	2023												2024					
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
cargo bikes 4.2 Operations with e-vans 4.3 Completion of operations										■	■	■	■	■	■	■	■	■

Customer	2023												2024					
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 1: Usage and KPI Definition		■	■															
Task 2: Preparation with Operator Vanapedal				■	■	■	■	■										
Task 3: Recruitment of First Merchants/Users on E-cargobikes Platform										■	■							
Task 4: Customer Satisfaction Study										■	■	■	■	■	■	■	■	■

CLEM launch in the Métropole du Grand Paris

Clem is already a major operator in Paris. It was the first to operate with shared e-vans for urban freight mobility. Clem operates in 50 stations with 100 e-vans. Paris is in the LEZ of Metropole du Grand Paris. Metropole of Grand Paris represents another 137 cities around Paris. With Metropole du Grand Paris, Clem will settle multimodal solutions for cities with both e-vans and e-cargo bikes.

Value proposition: product and services identification

Clem has developed its own IoT-based electric vehicle (EV) sharing platform. The main contribution to the Tactic project is to allow different mobility service providers to integrate their services on the platform, (i.e., this solution is functional as it allows, in collaboration with Vanapedal, to operate on a wide variety of parcels weighing over 30Kg using E-Vans). The technology developed under TACTIC will allow to integrate the partners mobility services to Clem's platform with more logistical options, that will be specifically adapted to the needs of the providers. This will allow more options for the end-users who can benefit from a safer delivery of large parcels.

- All stations are located in Paris, in addition two multimodal station for logistic will be located in Metropole du Grand Paris.

- Two cities have been chosen - Rueil Malmaison and Montrouge.

- Rueil Malmaison is in the west of Paris and Montrouge in the South of Paris. Both are in the LEZ and with a quite high density of merchants, logisticians and inhabitants.

- Clem will create the cargo-bike page in its application, which will be available in the multiple languages of Clem's app including French, English, Spanish, and Catalan, as shown in Figure 24.

Figure 24: Homepage of CLEM's website

- The e-vans will be placed in stations and will be accessible to logistics professionals for a guarantee during the week. Merchants and residents will also have access to the e-vans through formula.

- With the new cargo bike application, Clem and Metropole du Grand Paris will meet the Francilian cargo bikes owners/operators to propose them to share their cargo bikes at least during the Weekend. The project will involve the cities to target local merchants and inhabitants.

Table 9: MGP Living Lab vehicles

MGP Living Lab	Vans Paris	Van MGP Rueil	Van MGP Montrouge	Van MGP others	Cargo Bike Rueil	Cargo Bike Montrouge
	95	1	1	3	1	1

- The stations will be settled for e-vans in May 2023 and in September for cargo bikes. The cargobikes will be put at or near the station depending the city and the situation.

- The cargobikes will be operated with swapping batteries.

User journey

- Collaboration with cities to promote the e-vans and platform to logistics professionals, merchants, and users.

- The Business model we will challenge: the logistics professionals will have a 70% stake in bookings through guaranty formula, the merchants and inhabitants will have a 30% stake through Flex formula.

- Clem will ensure that the platform is easily accessible to users through a banner accessible through partners and cities and the solution will be accessible through the Maas Platform of IDF Mobility.

Table 10: Business Model

Case 2 : Garanty Mode
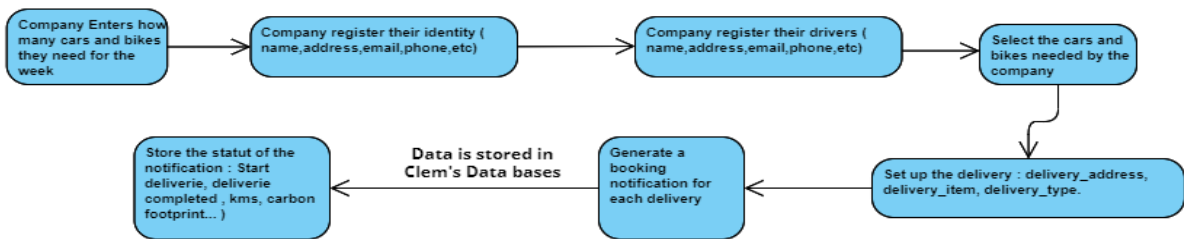
Title	User benefits from a guaranty formula
Pre-conditions	Non
Input	User specify how many cars and or bikes they need
Output	Booking notification is generated

Title	1st Case of Case 2: Logistician
Pre-conditions	He is in contract with a e-commerce platform He has a contact with the e-sharing platform He has a guaranty booking contract for using the e-cargo bike and/or e-van during the Week And/or He has a Flex booking access for booking then using the e-cargo bike and/or e-van Week and Week-ends
Input	Non

Output	Booking notification is generated

Case 2 - 1 : Logistician
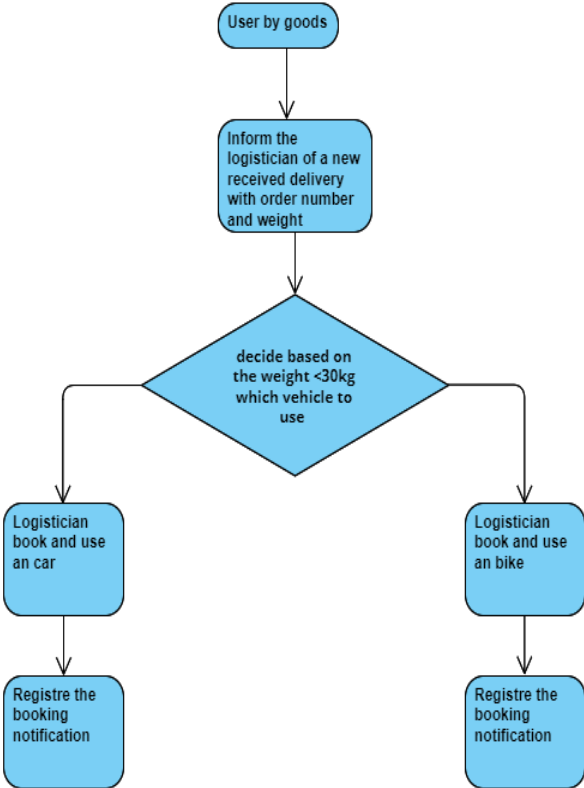
Title	2nd Case of case 2: Merchant
Pre-conditions	He is in contract with an e-commerce platform He has a contact with the e-sharing platform He has a guaranty booking contract for using the e-cargo bike and/or e-van during the Week And/or He has a Flex booking access for booking then using the e-cargo bike and/or e-van Week and Week-ends
Input	User buy goods through the e commerce platform or directly from the merchant
Output	Booking notification is generated for the delivery

Case 2 - 2 : Merchant
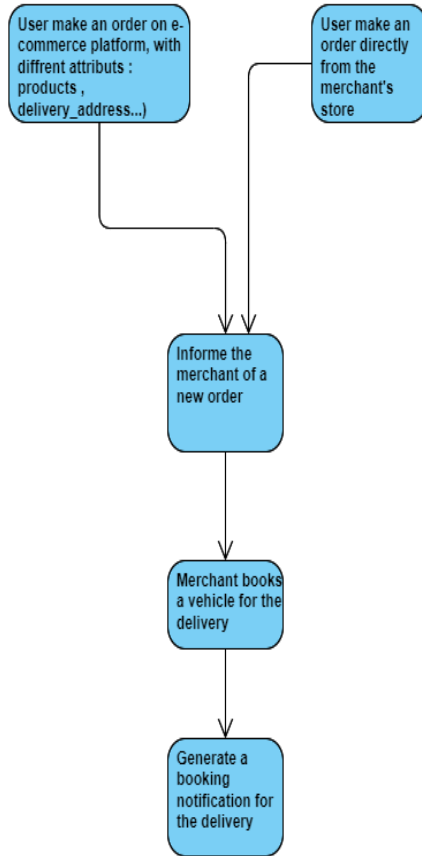
Title	3rd Case of case 2: Inhabitants
Pre-conditions	He has a Flex booking access for booking then using the e-cargo bike and/or e-van Week and Week-ends
Input	User buy goods through the e commerce platform or directly from the merchant
Output	User is billed for the journey

Case 2 - 3 : Inhabitants
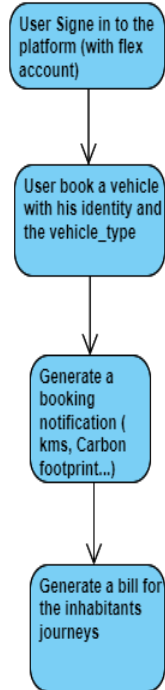
Development plan, roles and responsibilities

In TACTIC, Clem will be responsible for several tasks related to the development plan and implementation of the logistics platform:

- Provide its API, which will be accessible for integration in logistics and Maas platforms;

- Create the cargo bike page in Clem's application with support or EIT for French, English, Spanish, and Catalan languages;

- The logistics platform will offer measurable advantages for users, merchants and logisticians.

	2023												2024				
Paris Living Lab	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 1: Station Definition and Selection																		

Paris Living Lab

	2023												2024					
Paris Living Lab	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 2: Contracts and Equipment Ordering 2.1 Writing contracts 2.2 Ordering e-vans and cargo bikes 2.3 Ordering other necessary equipment for the stations			█	█														
Task 3: Station Integration 3.1 Integrating ERP systems of the stations 3.2 Integrating physical stations				█	█	█												
Task 4: Vehicle Deployment and Testing								█										
Task 5: Beginning operations with e-vans							█	█	█	█	█	█	█	█	█			
Task 6: E-Cargobike Study and Deployment 6.1 Studying the implementation of e-cargobikes 6.2 Deploying 3 additional vehicles 6.3 Deploying e-cargobikes						█	█	█	█	█	█							
Task 7: Beginning operations with e-cargobikes											█	█	█	█	█			

Customer study

	2023												2024					
Customer study	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Task 1: KPI Definition			█															
Task 2: City Meetings				█														
Task 3: Commercial Relationship Establishment 3.1 Starting commercial relationship with operators, merchants, and users 3.2 Starting presentation of the cargobikes sharing platform to operators					█	█	█	█	█	█	█							
Task 4: Recruitment of First Operators/Merchants/Users											█							
Task 5: Customer Satisfaction Study											█	█	█	█	█	█	█	█

6.2   Marketed innovation: Green Logistics operation in Barcelona

Vanapedal is an SME company which operates Last-Mile delivery services by cargo-bike from a hub located in central Barcelona (Estació de França). Over more than a decade it has grown (the number of cargo-bike services and the catchment served) by carrying out Last-Mile deliveries for a variety of shipper clients. In 2020 it implemented trials of a prototype cold box (total weight of 120kg) for Europastry, following the same business model i.e., cargo-bike last mile with trans-shipment at the hub from a lorry full of goods for shippers with significant logistics chains.

Vanpedal started diversifying its business by becoming a reseller of GWW cargo-bikes in 2020, the same year it became the regional centre for Bosch (electric motors and accessories). In 2021 it trialled a Large Parcel Box which was successfully marketed - in collaboration with GWW within the HALLO project. A second prototype Cold Box (total weight of 75kg) was developed but not trialled in HALLO.

Value proposition: product and services identification

Vanapedal entered the TACTIC project, with a view to offer its own-brand parcel delivery service via its own portal as well as collaborating with TACTIC partners on defining an Integrated Product based on city sustainable logistics pilots. The basic idea is to utilise afternoon capacity using the fleet that serves its shipper customers during the morning. The fleet includes a variety of cargo-bike types able to serve higher volumes and travel greater distances. TACTIC's focus on home deliveries from Municipal markets is a new opportunity to open up cargo-bike services for the foods sector using the Cold Box prototype (developed and supplied by Greencold).

From its own market research, Vanapedal estimates that any parcel service it offers to local businesses (i.e. those within the postcodes of Ciutat Vella district) must cover all the postcodes of the city. The first candidate service considers parcels weighing less than 20kg. This could be done using different types of cargo-bike – see Figure 25.
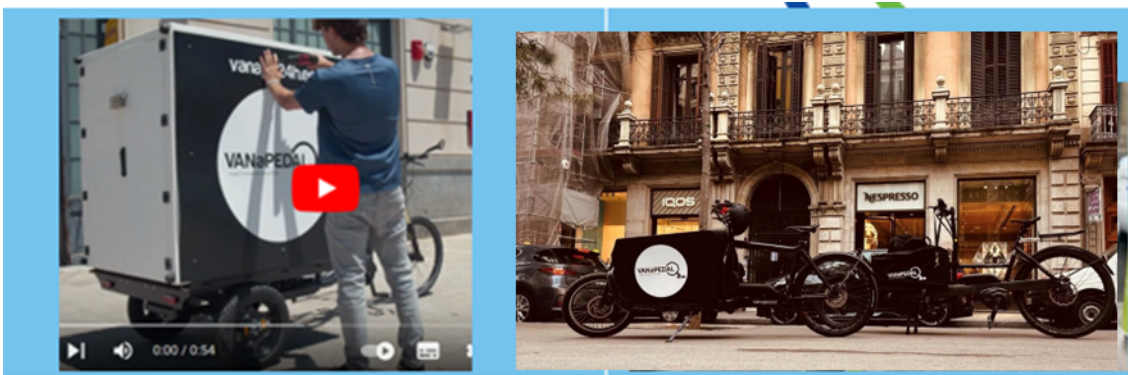

Figure 25: The candidate city-wide small parcel delivery service will use different types of cargo-bikes.

One of the motives for joining TACTIC was to enable an enhance the service to be offered to the same target clients using e-van sharing to handle the delivery of both small AND LARGE parcels:

- small parcels delivered by cargo-bike;
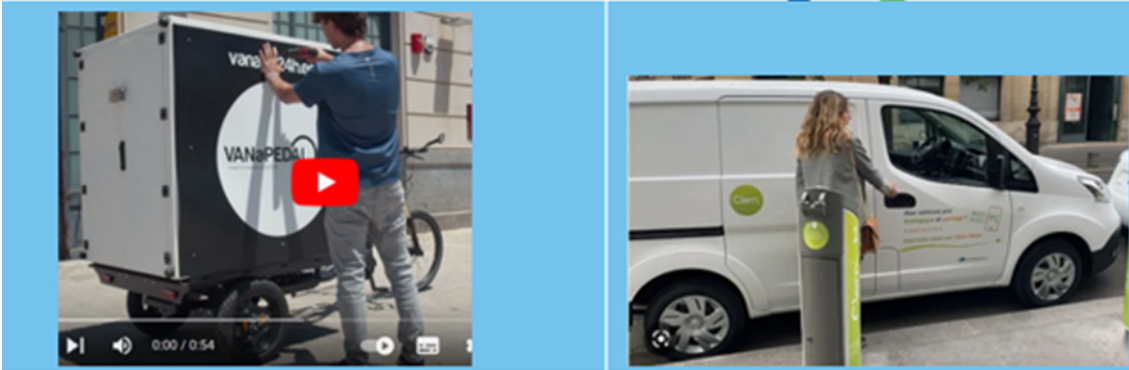
- large parcels delivered by e-van.

Figure 26: The candidate city-wide small & large parcel delivery service will use different types of cargo-bikes and e-van sharing.

TACTIC includes a pilot of zero-emission deliveries for purchases made on-line of foodstuffs available at Barcelona's municipal markets. Vanapedal's role in this is as a Logistics Operator using a version of HW's marketplace that is being adapted for TACTIC to facilitate deliveries using cargo-bike. To cover the full range of food products the plan is to use the Cargo-bike Cold Box prototype – Figure 26– in the Barcelona pilot.

Figure 27: Vanapedal's Cold Box prototype forms part of the pilot zero-emissions delivery service for Municipal markets of Barcelona, and also a candidate to be a TACTIC product.

Vanapedal is preparing the launch of parcel delivery services. These are shown as candidate innovative solutions in the table below. The segmentation of these parcel services will be further reported in DEL03.

Handling occasional large parcels is part of the LM operations – but these are not part of the planned service. If a significant demand for large parcels delivery is registered and the e-van pilot works well then Vanapedal might consider renting out a 2nd CLEM e-van (Ciutat Vella deliveries requiring 2 people).

The costs and time required to produce a 2nd Cold Box unit (for pre-commercialisation assuming a successful pilot) are beyond the scope of TACTIC – but could be considered within the URBANE project.

<div align="center">Table 11: TACTIC's products.</div>

Product/Service Code	Product/Service Name	Product/Service Description
TACTIC Solution-03	Integrated Product service	Based on orders made via TACTIC's portal, parcels (20kg to 50+kg) are transported by CLEM's e-van sharing or the Cargo-bike Cold Box prototype (Weekdays, from 09.00 to 17.00) from markets in Ciutat Vella to end-customers city-wide.
TACTIC Solution-03A to 3C	Small Parcels delivery services	Based on orders made via Vanapedal's portal, parcels are transported by cargo-bike from City Centre commercial outlets to end-customers City-wide; segmentation by city area and by urgency (24h or point-to-point hourly schedule). Further details in DEL03.

User journey

Vanapedal is producing a video to present the small parcel service it will offer to potential clients via its Vanapp24h portal. The plot is basically about following the client's package – a visual user journey covering:

- order receipt by phone (portal from September)

- assignment of cargo-bike to collect parcel / reception of parcel at the hub (various tariffs apply)

- planning of Next Day delivery routes (parcels by bike and rider)

- dispatch of delivery service with parcel delivery within 24h.

The initial response from potential clients is that they did not realise that Vanapedal has more than one model of cargo-bike, and that the agile/fast models (Bullit / Reise & Müller) are capable of serving districts across the city, even those with significant gradients.

For the Integrated Product (IP), Vanapedal is the zero-emission Logistics Provider for HW. This will be a Proof-of-Concept of deliveries using the Cold-Box prototype. Via the IP Control Panel Vanapedal will offer a limited service depending upon the pilot constraints and the IP platform will offer the user these options as alternatives to the existing logistics service(s). In terms of the IP user journey, Vanapedal intervenes when the order is confirmed and when the Picker enters "order collected" until delivery at the customer's stated address.

Development plan

Essentially Vanapedal is a provider of last-mile sustainable logistics services. In the parcels sector, it has established itself to the degree that it can offer the small parcels service via its own portal. The collaboration with CLEM is expected to widen this service to facilitate the carriage of larger parcels using the rental of e-vans. It then harnesses these tools to act as zero-emissions Logistics operators for HW's marketplace; this also provides the opportunity to trial an improved prototype Cold-Box.

The contract and the Consortium Agreement identify Vanapedal as a Commercial Partner and the key deliverable for such a partner is to ensure – to the best of its abilities – that a Marketed Innovation is delivered within the (18 months of the) project duration. The candidate products identified above will be further examined to identify their respective potential for KPI achievement.

The tentative milestone plan is:

April to May:

- Video-based face-to-face marketing of 24h parcel service;

- Incorporation of e-van rental in delivery operation;

- Receipt of Cold-Box / IP logistics control panel prepared.

June to July:

- 1st deliveries of parcels (phone orders); tariff/service adjustments;

- Cold-Box prototype commissioned.

August to September:

- Portal launched including video;

- Initial assessment of 24h service, Next Step services;

- Finalisation of IP pilot preparation.

October onwards:

- IP pilot.

6.3   Marketed innovation: green logistics integration.

Hermeneus World has developed 100% in-house and owns a software called Digital Market that facilitates the digitization of complex commercial ecosystems. With this software, whose intellectual property rights belong entirely and exclusively to Hermeneus World, more than 21 e-commerce platforms have already been deployed. These platforms operate as marketplaces (allowing participating merchants to market their products directly to end consumers) and are owned and operated by Hermeneus World. To date,

among the different platforms deployed, more than 6.000 merchants have been served, offering more than 150.000 references.

The software provides an innovative and differentiated service from other alternatives that currently exist related to the digitization of businesses. It contains very significant technical differences specifically focused on small merchants and markets, but the most important ones are related to the strategic difference in the project approach and the objective it pursues.

That difference in the strategic approach has been the reason why Hermaneus World has been officially qualified by the European Commission as "European Union Best Practice for the revitalization and modernization of small commerce", including them in an online guide disseminated to all European local authorities on examples of good practices to implement. Additionally, they have been awarded by the Spanish Secretary of State for Commerce as the best technological idea for Retail.

Value proposition: product and services identification

All Hermeneus World's platforms have logistics solutions integrated that allow buyers to receive their products conveniently at home. In all cases, these are large logistics companies with a national footprint and advanced technological solutions with which costly ad-hoc integration processes have been developed.

The SDGs of the United Nations 2030 Agenda for Sustainable Development and the SOs of the EIT Urban Mobility drive the development of a sustainable "last mile" delivery system that contributes to the development of liveable urban spaces, the development of green mobility solutions, improved market opportunities and behavioural changes.

Under these parameters, the opportunity has been identified to support the development of local ECO-logistics solution operators, generally provided by small and medium-sized companies, which do not have complex management software nor the capacity to carry out the integration process (which in no case would be scalable or economically interesting given that their scope of operations is local).

These local ECO-logistics operators provide an unbeatable adaptation to the particularities of each environment/ecosystem and respond to different value-added proposals (price, delivery time, sustainability, ...) that will be aligned with the particular preferences of the different retailers and buying users when selecting their services in both cases.

Based on this pre-existing software (Digital Market), the pilot project of the Barcelona Living Lab will be developed, which will consist of the deployment of a specific functionality integrated within the Hermeneus World platform that will allow testing a new platform membership service for multiple local ECO-logistics operators through a control panel that will give them access to offer their services and receive transport requests without the need to carry out costly technological integrations between the operator's platform and the Hermeneus World platform.

All platforms deployed by Hermeneus World have a leader (as an example, in the case of "Mercats a un clic" the leader is the Barcelona City Council through the IMMB) that defines some business rules that, in turn, activate or deactivate various functionalities that the Platform has (geographical scope of operations, shipping methods/collection, payment methods, minimum order, cost of transport, ...).

In general, in the case of multiple operators that comply with the pre-selections made by both the seller (when parameterizing their products) and the buyer (when indicating the delivery address and selecting

the time slot), the selection rules will be decided by the platform leader within the different possibilities. As an example, these could be:

- Automatically select the most economical option;

- Allowing the user to choose from a reasonable number of options.

Hermeneus World will work on the user experience to identify the possibilities which are reasonable and operative in order to implement them in the functionality.

In the specific case of the Living Lab in Barcelona, this functionality will allow:

- that the logistic operator Vanapedal can be incorporated into the Hermeneus World platform, offer its services to the merchants participating in the test and receive the orders generated on the Hermeneus World platform.

- that anyone wishing to transport products from outside the Hermeneus World platform may contract: the e-vans sharing services of CLEM through its specific platform by means of a link to the same; the services of a carrier through a link to Vanapedal.

The module will only be compatible/interoperable with Hermeneus World software and its platforms.

The module will be tested on the Hermeneus World platform deployed in Barcelona (as long as the established business rules are respected) or on a platform owned and operated by Hermeneus World with similar technical characteristics selected by Hermeneus World for this purpose.

In any case, the TACTIC project is totally unrelated to Hermeneus World's contract with IMMB.

The selection of the markets and/or businesses that will participate in the Barcelona living Lab test and their adherence to it will in no case be the responsibility of Hermeneus World.

User journey

The process begins with the incorporation of the local ECO-logistics provider into the platform deployed by Hermeneus World. Through a simple onboarding process, they will register their data and will register the transport services they want to offer to the retailers, indicating the time slots and the corresponding costs depending on the kg to be transported.

From that moment on, the transport services will be available to the retailers, through their control panel, so that they can parameterize their references with them if they consider it appropriate.

At the end of the purchase process, Hermeneus World will transfer to the agents involved, the information relating to the order and status changes within the existing options on the platform on which the test is performed.

The purchasing customer will have complete information about his order through his control panel, including information about the logistics operator and its characteristics.

Once the order has been successfully delivered, the amounts derived from the operation are settled between the different agents involved (platform, merchants and logistics operator) as long as the payment has been made through Hermeneus World's payment systems.

Development plan

February 23 - May 23: Conceptualization of the functionality, creation of user stories, validation of processes, analysis of the integration of the functionality with the rest of the platform.

June 23: Presentation of mock-ups.

September 23: Release of the functionality to be tested at the PRE-Production level.

November 23: Release of the functionality in the PRE/PRO environment (as decided) for testing.

November 2023 to May 2024: Barcelona Living Lab test.

7 Conclusions

The main goals of this deliverable are the definition of the TACTIC living lab model for Barcelona and Métropole du Grand Paris and the development of the technical plan of the marketed innovation to be tested in the pilots.

The design of the living labs starts with an overview of the cities' characteristics, vision and policies on sustainable logistics and local commerce. Then, the main challenges of the cities are identified focusing mainly on the need to accelerate the transition towards cleaner vehicles and the mitigation of the environmental impact associated with logistics movements in terms of noise, pollutants and GHG emissions. The next step is the definition of the scope and objectives of the pilot taking into account the area of influence, key stakeholders and key moments of each of the living labs. The deliverable deepens the conceptual idea of the pilot by clarifying the roles of the stakeholders and the deployment plan. In a nutshell the Living Labs:

- Barcelona's Living Lab envisages an integrated package of three (3) services and solutions to boost local commerce and, at the same time, chart the way towards zero-emission urban logistics, including:

  o E-vehicle sharing platform: sustainable vehicles of shared use for logistics purposes, including electric cargo bikes and electric vans, accessible for both logistic operators and the general public through the platform of Clem'.
  o Sustainable logistic operation: A logistics service, developed by Vanapedal, using exclusively zero-emission vehicles. The zero-emission logistics service is tailored to demand and aims to optimise urban logistics. On the one hand, the size of the vehicles and the type of vehicles responds to the characteristics of the product and the required logistics service. On the other hand, the design of the logistics services considers the grouping of orders, avoiding the need for one trip per order.
  o Green logistic integration in e-commerce platform: Integration of logistic services in the e-commerce platform through a logistics provider control panel.

- Métropole du Grand Paris: The aim of the project is to establish a sustainable and efficient logistics infrastructure in selected towns in the Metropole du Grand Paris region. This will be achieved through the introduction of a shared-vehicle electric platform for logistics, which will give logistics operators and local businesses access to electric vehicles and cargo bikes. The introduction of this platform foresees a significant reduction in the number of gas vehicles in circulation and promotes environmental sustainability.

Once the living labs have been defined, the document presents in detail the description of the three marketed innovations, including their value proposition and identification of services, user journey and deployment plan.

This product is the first step towards achieving a couple of key performance indicators of the TACTIC project:

- KONHE3.2: Cities engagements in projects

- EITHE02.1: Marketed innovations

- KSN02: Living labs within a project that actively involve citizens and/or local associations.

The iterative fine-tuning of the living lab model plans for each pilot city will continue throughout the duration of the project, as new requirements and findings will be continuously generated on the one hand from the knowledge, experience and expertise of each consortium partner and on the other hand from the input and feedback of the end-users of the different solutions. The results of this deliverable (DEL01-Technical Plan) will be directly processed within the following deliverables related to the product plan and business plan of the marketed innovations, in order to further advance with its development. In addition, the definition of the scope and objectives of the living labs pilot projects, as well as the identification of key stakeholders, the roadmap of the pilot projects and the action plan of the TACTIC products identified during the development of this deliverable are the roadmap for the successful pilots deployment.

In conclusion, this deliverable is the result of the TACTIC task A2302, "Living Labs Design". Therefore, it is the main input to ensure the successful achievement of project output 04 "Lab testing of innovation products (1), (2) and (3)".

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