Authored by **Copenhagen Business School**



REPLICATION GUIDE

For Decarbonising Last-Mile Logistics

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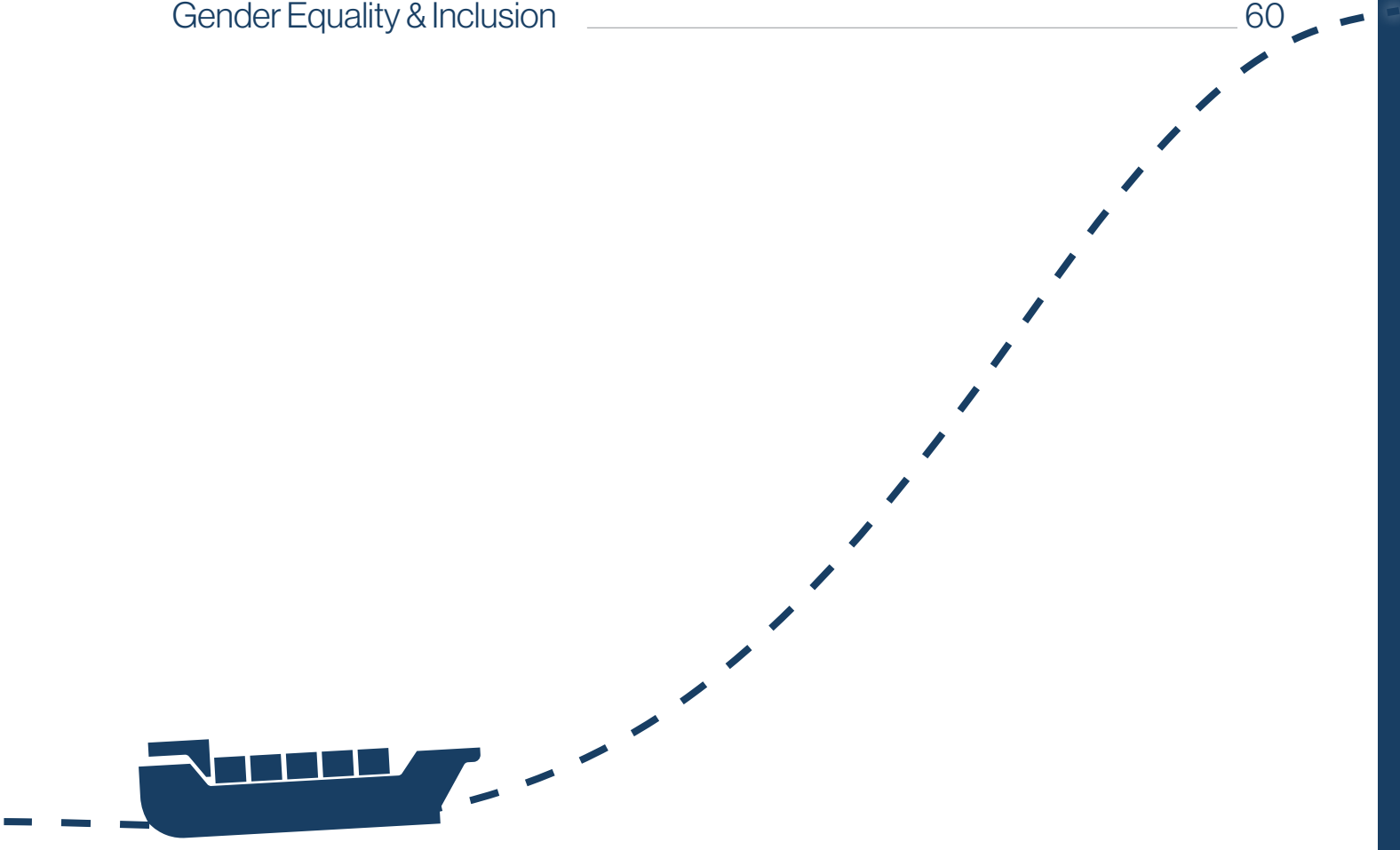
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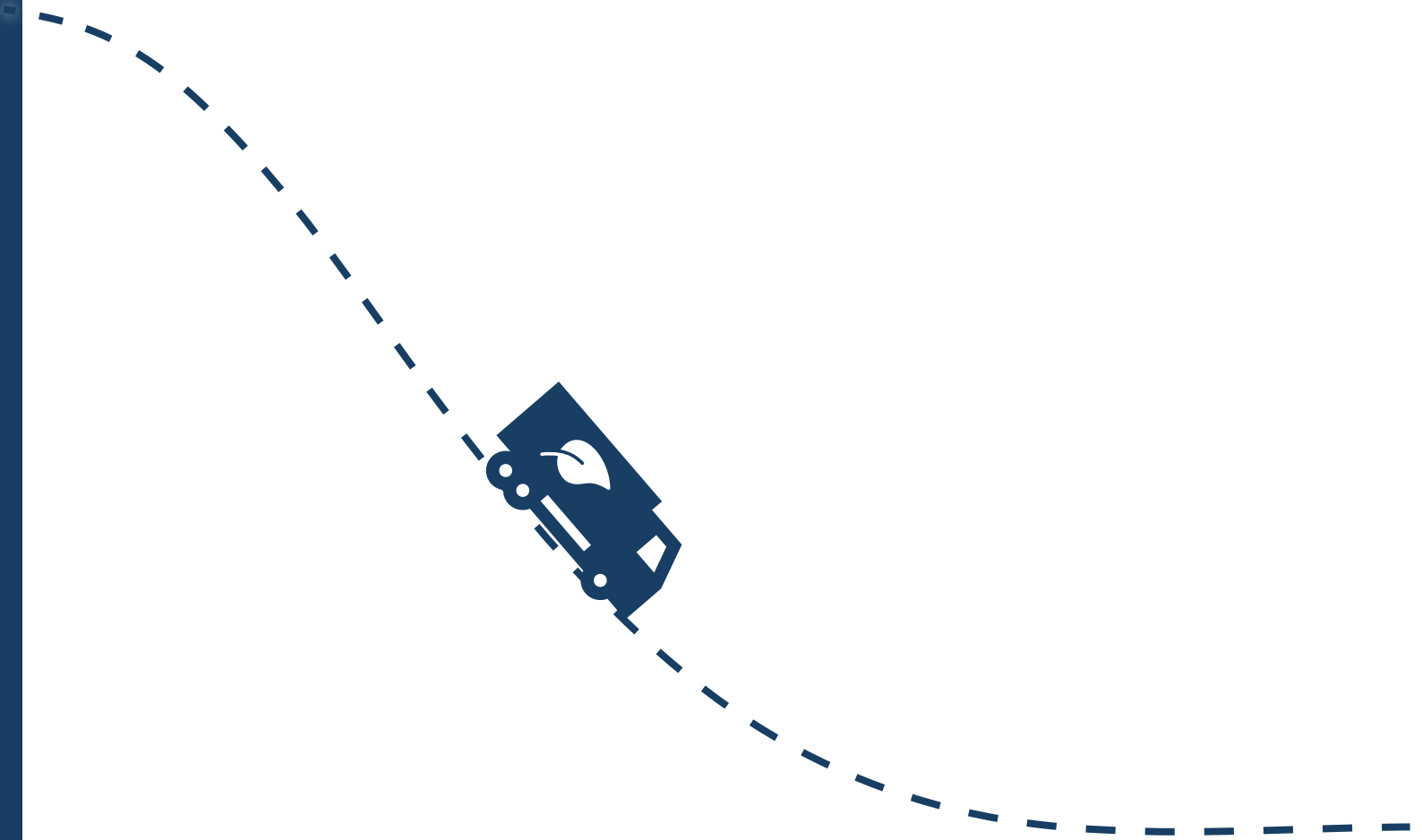
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ACRONYMS

Acronym	Meaning
API	Application Programming Interface
BM	Business Model
CBA	Cost-Benefit Analysis
GM	Governance Model
ICT	Information and Communication Technology
KPI	Key Performance Indicator
LEZ	Low-Emission Zone
LML	Last-Mile Logistics
LL	Living Lab
MVP	Minimum Viable Product
NDA	Non-Disclosure Agreement
NGO	Non-Governmental Organisation
PAF	Planning Analysis Framework
SBMC	Sustainable Business Model Canvas
SUMP	Sustainable Urban Mobility Plan
UC	Use Case
VPC	Value Proposition Canvas

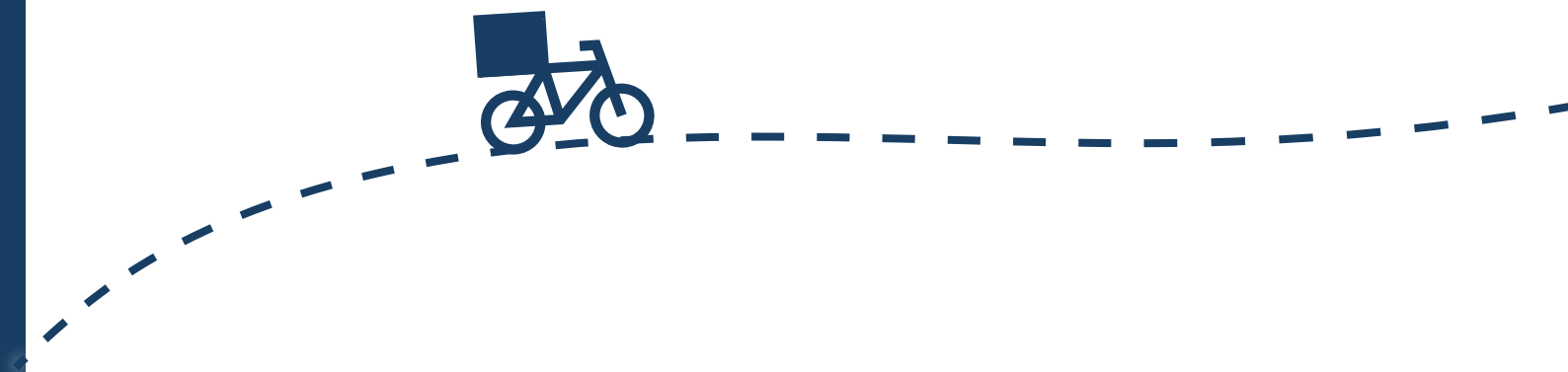


INTRODUCTION TO THE GUIDE

The DECARBOMILE Replication Guide translates the practical experiences gained from implementing innovative last-mile logistics (LML) solutions across four European Living Labs (Nantes, Hamburg, Logroño, and Istanbul) into actionable guidance for cities, logistics operators, and other relevant stakeholders. Rather than presenting a fixed methodology, the guide offers a flexible framework that can be adjusted to different local contexts and implementation needs.

Based on lessons learned throughout the project, from baseline assessment and stakeholder engagement to implementation, demonstration, and impact evaluation, it highlights practical recommendations, common challenges, and proven approaches that can support the deployment of sustainable urban logistics solutions.

While the guide is presented as a step-by-step process, projects rarely unfold linearly, and users may also navigate directly to the sections most relevant to their stage of development. Sections like Communication & Dissemination as well as Inclusion & Equality should be treated as continuous phases throughout the entire project duration.



How to use this guide

This guide is designed as a practical roadmap for planning, implementing, and evaluating sustainable last-mile logistics solutions. It is based on the experience gained throughout the DECARBOMILE Living Labs and presents the key activities, decisions, and lessons learned across the different phases of the project.

Although the guide follows a logical sequence from project preparation to impact assessment, each chapter can also be used independently depending on the reader's objectives and the maturity of their initiative.

Each chapter is structured as follows:

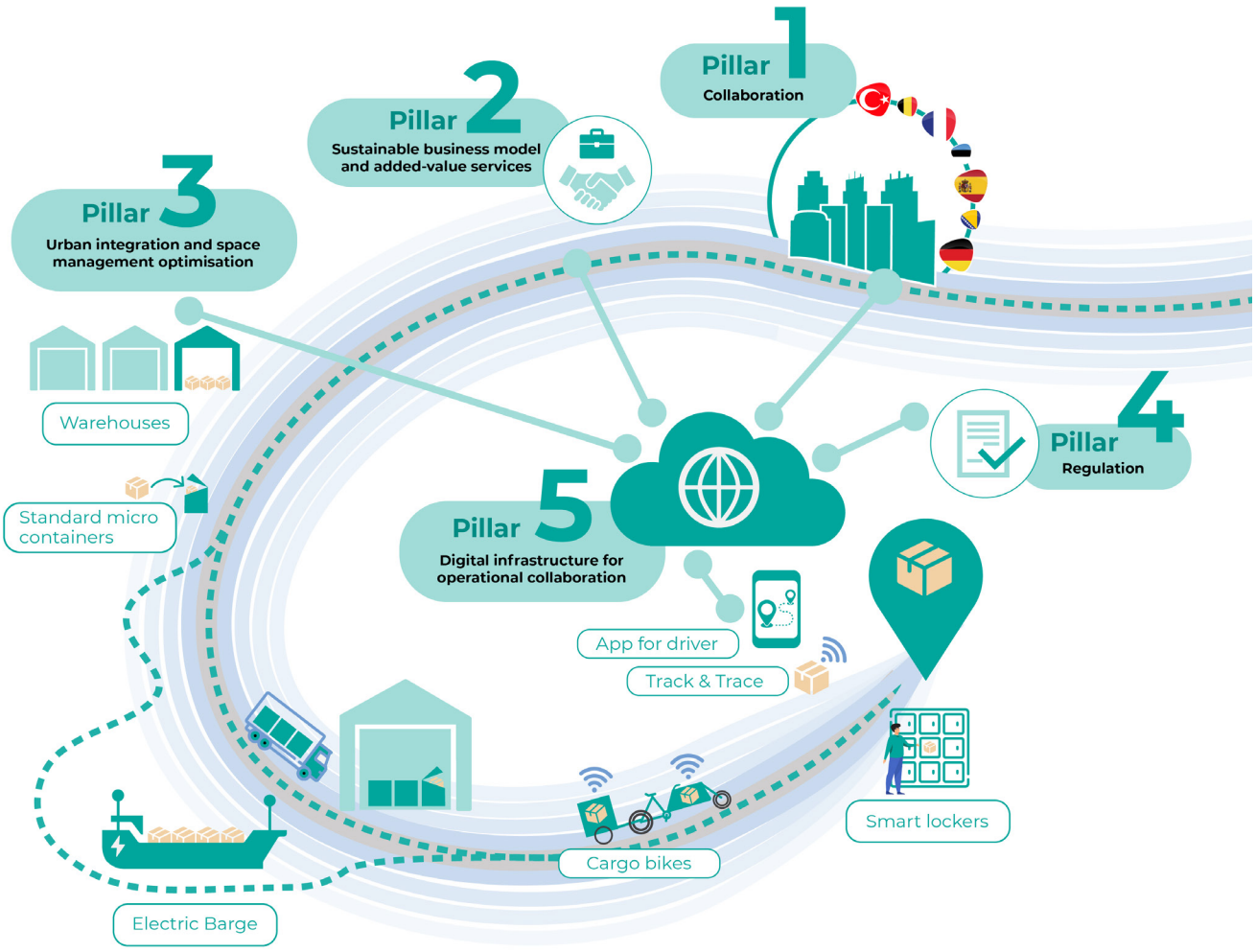
- Introduction explaining the role of the phase
- Objectives and expected outcomes of the phase
- Key activities and recommended actions
- Practical recommendations

This allows users to either follow the complete implementation pathway or focus on the sections most relevant to their current needs.



ABOUT DECARBOMILE

DECARBOMILE was a Horizon Europe project bringing together 31 partners from 11 European countries to support the transition towards cleaner, more efficient, and collaborative last-mile logistics. Working with cities, logistics operators, businesses, researchers, and technology providers, the project developed and tested sustainable urban logistics through four Living Labs (LL), complemented by four Satellite Cities that explored their adoption and replication in different urban contexts.

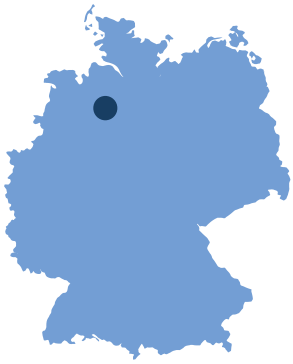


The Living Labs

DECARBOMILE demonstrated its solutions across four Living Labs, each addressing different local challenges and testing approaches tailored to its specific urban context.

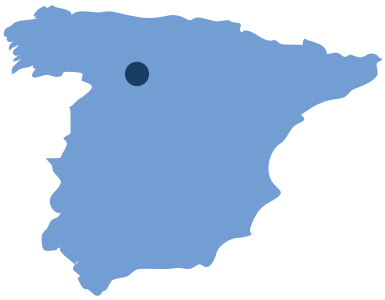
HAMBURG (Germany)

Investigated the feasibility of utilising urban waterways and cargo bikes for parcel deliveries, testing a multimodal last-mile delivery concept that connects water and land transport



LOGROÑO (Spain)

Implemented a municipal cargo bike delivery service for local commerce, a multi-service micro-hub, and smart lockers for local shops to expand their business beyond opening hours



NANTES (France)

Focused on accelerating the transition to sustainable urban deliveries through cargo-bike operations, a cycle-logistics station, and innovative beverage deliveries using public parking spaces



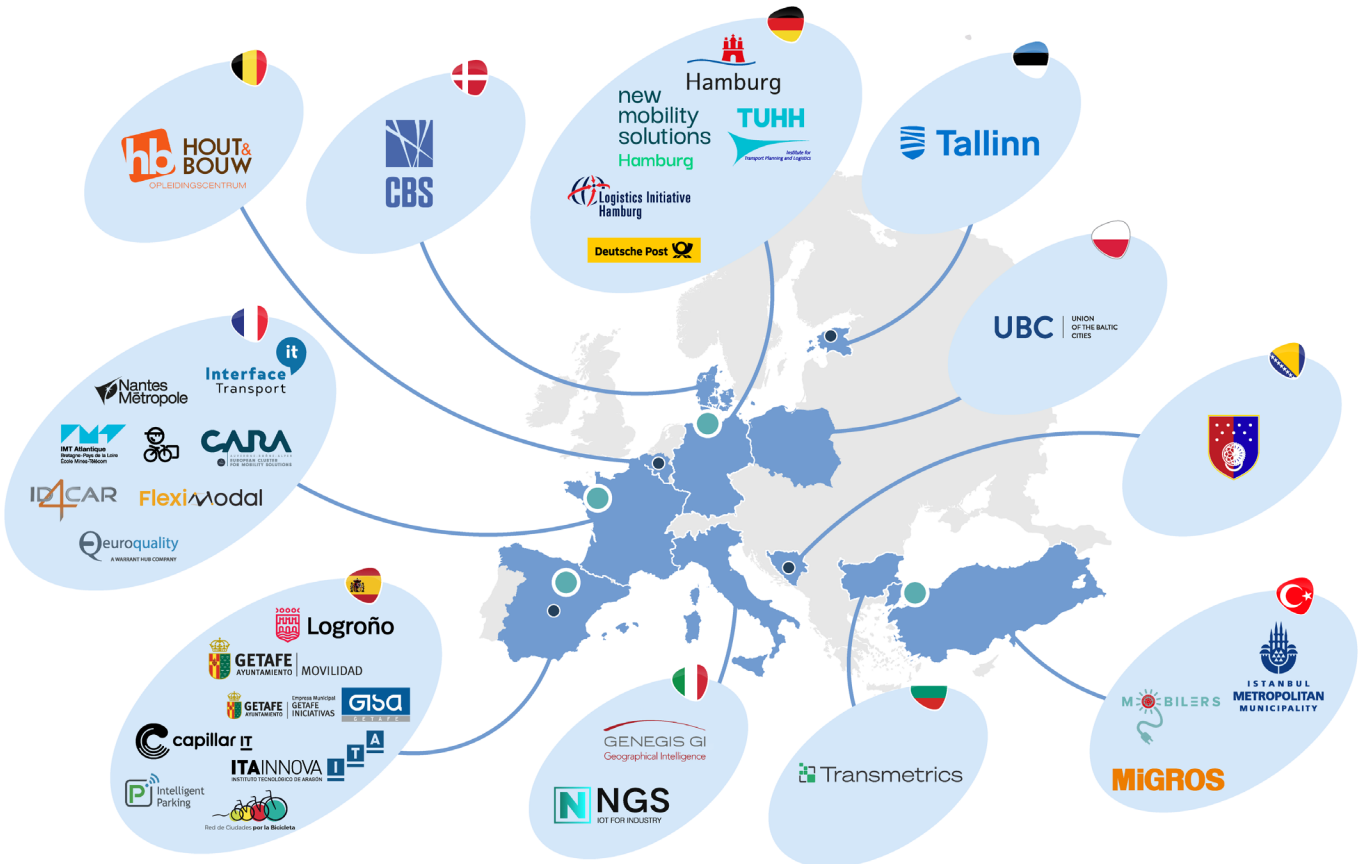
ISTANBUL (Türkiye)

Addressed urban congestion and limited logistics spaces through e-bike delivery operations and the development of a shared logistics space for multiple operators



PROJECT CONSORTIUM

31 Partners from 11 European countries collaborate, including 4 universities, 9 SMEs, 2 industrial partners and 16 public organisations.



PROJECT OVERVIEW

The implementation of sustainable last-mile logistics solutions involves several interconnected phases, from understanding the local context and engaging stakeholders to implementation, evaluation, and communication. The overview in Table 1 summarises the main phases covered in this handbook, their objectives, and the key outputs that can support the development and implementation of a use case.

Table 1: Project Overview

Phase	Main Objective	Key Output	Additional Insights
Baseline Assessment	Understand the local context	Baseline analysis, State of the Art, Potential use cases	D1.1
Stakeholder Engagement	Build and maintain collaboration	Stakeholder mapping, Stakeholder engagement plan	D2.2
Use Case Definition	Define and co-design the use cases	Use case definition sheet	D2.1 D5.1
Information & Communication Technology (ICT) Tool Development	Develop tools to support the operational needs of the use cases	Overview of technical needs, Selected ICT Tools and integration plan	D4.1 D7.2
Preparation & Implementation	Prepare and implement the use cases	Implementation roadmap, Regulatory approvals	D7.1
Demonstration	**Test the solution**	Operational data, Monitoring, Lessons learned	D7.1
Impact Assessment	Evaluate the project results	Impact assessment, Recommendations	D8.1 D8.2
Communication	Communication about project progress and results	Communication plan and materials, Exploitation	Project Website*
Gender Equality & Inclusion	Reflection on the inclusiveness of the project and its solutions	Gender Equality Plan	D1.1

All project deliverables can be found here:

**Note: The project website will not be available after August 2028.*

PROJECT BLUEPRINT

The DECARBOMILE Project Blueprint (Figure 1) provides a high-level overview of the implementation journey followed throughout the project. It illustrates the main activities, interactions, and milestones involved in planning, implementing, and evaluating sustainable LML solutions. While the process is presented as a sequence of phases, implementation is inherently iterative. Activities such as stakeholder engagement, communication, and monitoring should continue throughout the project lifecycle and be adapted as implementation progresses. The Blueprint is included in the guide as a stand-alone leaflet.

Before you start

Before starting your project, consider the following objectives drawn from the DECARBOMILE experience. These recommendations can help anticipate common challenges and improve the likelihood of successful implementation.

- ✓ Build realistic and feasible use cases
- ✓ Invest sufficient time in stakeholder mapping and engagement
- ✓ Anticipate lengthy regulatory and administrative procedures
- ✓ Validate technologies under real operating conditions
- ✓ Keep implementation plans flexible
- ✓ Start monitoring and impact assessment early
- ✓ Plan for long-term sustainability

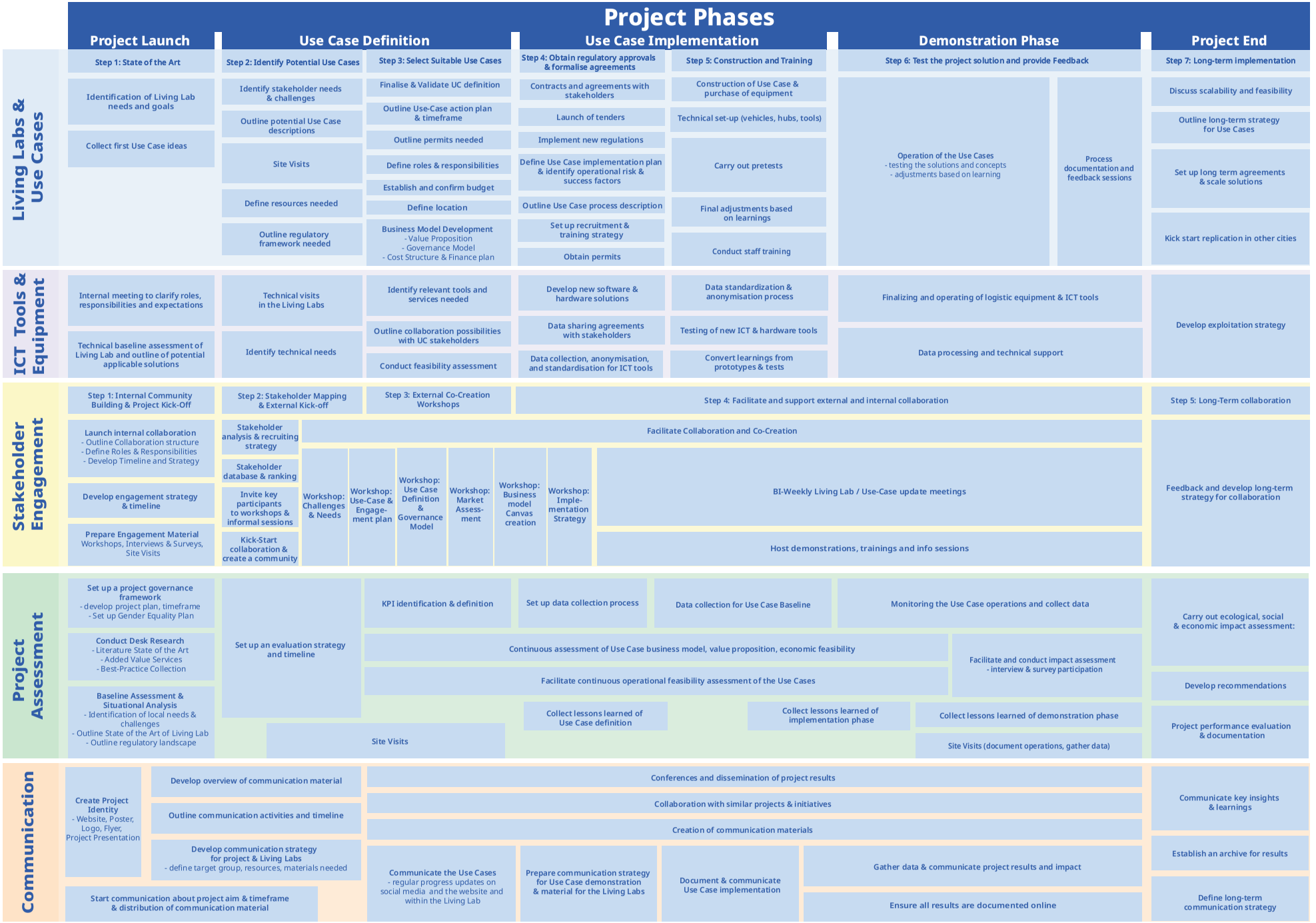


Figure 1: Project Blueprint

BASELINE ASSESSMENT

Why is it important?

Every city has its own logistics ecosystem, regulatory environment, stakeholder landscape, and operational challenges. Before designing solutions, it is essential to understand the local context in which they will be placed. Additionally, existing solutions, comparable projects, and best practices can be utilised. Building on previous experiences helps avoid duplication of effort and identify transferable lessons learned and recommendations.

A baseline assessment should, therefore, review the state of the art of planned logistics solutions, identify existing challenges, opportunities, and priorities, and provide in-depth insight into local contexts. Rather than producing an exhaustive analysis, the focus is on gathering the information required to support informed decision-making. It is not only about identifying problems to solve but also outlining the conditions under which new solutions can be implemented.

Finally, the baseline assessment provides the reference point for later evaluation and impact assessment. Relevant indicators such as operational efficiency, stakeholder satisfaction, and economic feasibility should be defined and, where possible, measured before the demonstration. This establishes a baseline against which changes resulting from the implemented use cases can be assessed.

Objectives

- ✓ Understand the current LML system and its stakeholders
- ✓ Assess the regulatory and operational environment
- ✓ Identify local challenges, opportunities, and needs

Expected Outcomes

- ✓ Documented baseline situation
- ✓ Outline of the State of the Art
- ✓ Clear overview of challenges and opportunities
- ✓ Shortlist of potential use cases

How to do it

The baseline assessment should be practical and focused. The goal is not to collect as much information as possible, but to identify the factors that can influence implementation and help shape realistic use cases. A combination of complementary methods is recommended in Table 2.

Table 2: Baseline Assessment Methods

Methods for Baseline Assessment	
Desk Research	Review existing studies, mobility plans, regulations and available data.
Stakeholder Engagement	Interviews, workshops or surveys to understand local needs, priorities, and operational constraints.
Site Visits & Field Observations	First-hand insights into logistics operations, infrastructure, and potential implementation locations.

What to assess

A baseline assessment should provide a clear understanding of the local context before solutions are designed. The areas described in Table 3 should be reviewed to identify opportunities, constraints, and implementation requirements. The findings of the baseline assessment then provide the foundation for the next step: identifying and engaging the stakeholders who will contribute to the design, implementation, and long-term success of the proposed solutions.

Table 3: Assessment Overview

Assessment Area	What to Assess	Key Questions to Consider
State of the Art	Review existing logistics solutions, comparable projects, and best practices implemented locally or elsewhere. Identify transferable knowledge, existing infrastructure, and opportunities to build on previous experiences.	What solutions already exist? What has worked well? What lessons/experiences can be transferred?
Baseline Situation in the Project Regions	Develop an overall understanding of the local context, including the city's socio-economic profile, freight demand, infrastructure, digital maturity, and existing initiatives.	What are the key characteristics of the city? What are the main logistics needs and constraints? Which local priorities should the project address?
Urban Logistics System	Analyse how goods currently move through the city, including key delivery flows, logistics hubs, vehicle types, peak periods, and areas with high logistics activity. Additionally, gain an understanding of the existing logistics infrastructure and resources, including digital solutions.	Where are the main logistics challenges? Which sectors generate the highest freight demand? Where are the bottlenecks in the logistics system? What resources/infrastructure are available?
Policy & Regulatory Framework	Assess the policies, regulations, and planning frameworks that influence urban freight operations, including delivery restrictions, low-emission zones, access regulations, and mobility strategies.	Is there a Sustainable Urban Mobility Plan (SUMP) or urban logistics strategy? Which regulations support or constrain implementation? Are any new regulations planned?
Challenges & Local Needs	Identify the main environmental, economic, and social challenges the project aims to address and define clear implementation objectives (e.g., increased number of low-emission vehicles, new regulations, enhanced collaboration).	Which problems should the project solve? What opportunities exist for improvement? What outcomes are expected?
Stakeholders & Governance	Identify the organisations involved in and affected by urban logistics. Assess their roles, influence, existing collaborations, and governance structures.	Who is affected by the system? Who are the key decision makers? How fragmented and competitive is the sector?

Practical Tip:

Go beyond desk research. Combine existing data with site visits and stakeholder discussions to understand how the logistics system operates in practice. Local stakeholders often have operational knowledge that is not available in official reports or datasets.

Practical Tip:

A successful baseline assessment identifies not only local challenges but also existing strengths. Existing logistics operators, digital tools, available infrastructure, or ongoing initiatives can significantly reduce implementation effort. Build upon these whenever possible to reduce implementation risks and accelerate development.



Figure 2: Workshop with stakeholders in Istanbul

STAKEHOLDER ENGAGEMENT

Why is it important?

Sustainable LML depends on collaboration between a diverse group of public and private actors. As no single organisation controls the entire logistics system, stakeholder engagement is essential for designing, implementing, and operating successful solutions. Beyond selecting appropriate technologies, success relies on building collaboration among the actors responsible for planning, enabling, and operating the solution.

Stakeholder engagement is not a one-time activity but a continuous process that evolves alongside the development of the use case. It begins with understanding the local stakeholder landscape, identifying the organisations that influence or are affected by the proposed solutions, and prioritising them according to their role, influence, and expected contribution. Throughout the project, maintaining communication and collaboration helps build trust, sustain commitment, and support the successful implementation and long-term uptake of the solution (Figures 2, 4, 6, 11, 15).

Objectives

- ✓ Analyse the Stakeholder Landscape
- ✓ Understand their interests, capacities, and influence
- ✓ Kick-start stakeholder involvement in the use case development

Expected Outcomes

- ✓ Stakeholder map
- ✓ An engagement plan
- ✓ Agreed governance arrangements
- ✓ Clearly defined stakeholder roles and responsibilities

Who are the Stakeholders?

Stakeholders are organisations, groups, or individuals who influence, are affected by, or contribute to the planning, implementation, and operation of a last-mile logistics solution. They bring different knowledge, resources, responsibilities, and interests, all of which shape the project's success. Together, they form the local stakeholder ecosystem.

Understanding who they are, how they interact, and what role they play helps identify the organisations needed to successfully develop, implement, and operate the proposed solution. While the stakeholder groups in Table 4 represent those most commonly involved in sustainable last-mile logistics, additional stakeholders may be relevant depending on the local context and selected use case(s).

Table 4: Key Stakeholder Groups & their Roles

Key Stakeholder Groups & their Roles		
Actors responsible for operating or enabling the solution	**Logistics Operators**	Operational expertise and delivery resources.
	Retailers & Shippers	Drive demand and influence supply chains.
	Local Authorities	Support through policies and regulations, coordination, planning, and access to/provision of public infrastructure .
Actors supporting implementation	**Technology Providers**	Provide digital tools, ICT systems, and technical expertise.
	Service Providers	Support implementation through operational, maintenance or consultancy services.
	Equipment Providers	Provide vehicles, facilities(e.g. hubs), etc.
	Infrastructure Providers	Provide and manage logistics infrastructure and facilities, and access to locations, support integration into the urban environment.
Actors shaping the environment, acceptance, or knowledge base	**Citizens/ End-users**	User acceptance, solution testing, feedback, and behavioural change.
	Universities/ Research	Research, testing, monitoring, data collection, evaluation, and knowledge generation.
	NGOs & Associations	Represent stakeholder interests, raise awareness, and support collaboration.

Stakeholders in EU-Horizon Projects

In European projects such as those funded by the Horizon Europe programme, stakeholders are also often grouped according to their level of involvement throughout the project as described in Table 5.

Table 5: Stakeholder Groups in EU-Horizon Projects

Stakeholder Groups in EU-Horizon Projects	
Consortium Partners	Organisations formally participating in the project through the Grant Agreement. They coordinate, manage, and contribute to the project's activities and deliverables, and are funded by the project.
Project Partners	Organisations contributing to the co-creation, development, implementation, or operation of the use case. These stakeholders are not part of the consortium but play a key role in the Living Lab. Depending on the solution, not all stakeholders involved in the design phase will participate in the operational phase.
End Users & Communities	Citizens, customers, employees, local communities, and other groups that use, experience, or are affected by the implemented solution. Their feedback supports evaluation, acceptance, and future replication.

How to Prioritise Stakeholders

Not all stakeholders are equally important for the project or require the same level of engagement. Some stakeholders play a central role in decision-making and implementation, others contribute specific expertise, and some are primarily affected by the outcomes. Prioritising stakeholders helps not only to ensure that the right partners are involved but also to plan an engagement strategy that allocates time and resources effectively.

As shown in Table 6, there are two important parts to consider when selecting and prioritising your stakeholders. The first is their relevance to the project, and the second is their engagement potential. Prioritisation identifies who matters most for the project, while engagement capacity determines your engagement strategy and how much each stakeholder should be involved.

Table 6: Stakeholder Prioritisation Criteria in EU-Horizon Projects

Assessment Criteria		Question to ask
Relevance to the Project	**Influence & Authority**	Can they influence the use case's success? Can they approve, enable, or block implementation?
	Expertise & Resources	How much knowledge, infrastructure and equipment can they contribute?
Engagement Potential	**Accessibility & Availability**	How easily will you be able to contact these stakeholders? How open are they to participating and contributing to the project activities?
	Interest	How interested are they in the proposed solution?
	Openness to Collaborate	Are they open to sharing data and resources, and collaborating with other stakeholders?
	Long-Term Commitment	Can they support the solution after the project ends?

How to: Map your stakeholders

Start broad by listing all stakeholders connected to the local logistics system. Then ask three simple questions:

- Who influences the project?
- Who contributes to the implementation?
- Who is affected by the solution?

Once identified, group stakeholders according to their role and prioritise those who require the closest collaboration throughout the project. You can use the power/influence matrix shown in Figure 3 to identify your key stakeholder.

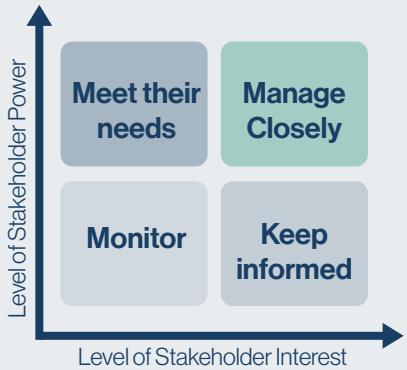


Figure 3: Stakeholder Mapping & Prioritisation Matrix

Find additional information at boreal-is.com



Figure 4: Workshop Activity with Stakeholders in Logroño

How To Engage Stakeholders

Stakeholder engagement evolves throughout the project. During the initial contact, clearly communicate the project's potential value to generate interest and encourage participation. During Co-Creation, stakeholders contribute their knowledge, needs, and perspectives to develop and refine the use case. Once the use case is sufficiently defined, engagement transitions towards Co-Production, where a smaller group of committed stakeholders actively supports the implementation, operation, and demonstration of the developed solution.

Table 7: Stakeholder Engagement Methods

Engagement Method		Typical Activities
Co-Creation	Collaborative development of ideas, solutions, and strategies where stakeholders actively contribute their knowledge, needs, and perspectives. This helps shape solutions that reflect local realities and stakeholder needs.	• Brainstorming sessions • Workshops & Co-Design activities • Interviews • Focus groups
Co-Production	Active involvement of stakeholders in implementing, testing, adapting, and operating the developed solution. Stakeholders move beyond idea generation to jointly deliver and refine the use case in practice.	• Pilot implementation • Operational testing & training • Monitoring • Evaluation meetings

Practical Tip:

Not every stakeholder needs to participate in every activity. Adapt the level of engagement to each stakeholder's role, capacity, and willingness to contribute. This helps avoid stakeholder fatigue and focuses resources where they create the greatest impact. Keep in mind that Co-Production requires a higher level of commitment than Co-Creation. Ensure that stakeholders are willing and able to make that commitment, and whenever possible formalise the commitment.

Adapt the engagement format to the stakeholder and project stage. While workshops are effective for Co-Creation and collective discussions, bilateral meetings are often better suited for detailed technical discussions, sensitive topics, or maintaining stakeholder commitment.

Stakeholder Engagement Roadmap

Stakeholder engagement processes are highly context-dependent and should be adapted to the local stakeholder landscape, project objectives, and operational realities. The timeline in Figure 5 is therefore not intended as a fixed process, but rather as a practical overview of the key phases and topics that should typically be considered within the engagement activities throughout the development and implementation of sustainable LML solutions.



Figure 5: Stakeholder Engagement Process

Identification & Involvement of Stakeholders

Identify the key actors involved in the local logistics ecosystem and assess their relevance, influence, and potential role within the project. This initial mapping helps build an understanding of the local stakeholder landscape and creates the basis for targeted engagement and collaboration throughout the project. Focus especially on how fragmented, complex, and competitive the landscape is, since these factors have the biggest influence on how resource-intensive the engagement process might be.

Kick-Off Meetings

After identifying relevant stakeholders, organise workshops to introduce the project and gather feedback on interest and feasibility. Key objectives of the meeting are to:

(1) Increase project awareness

(2) Collect local logistics challenges

(3) Assess stakeholder interest, needs, resources and participation

(4) Formulate next steps

Utilise the stakeholder feedback and insights you gathered to define a fitting communication strategy and style. At this stage, you should start by assessing the availability and resources of the individual stakeholders to determine which of them would be suitable to collaborate with.

Use Case Definition Workshops

Together with the selected stakeholders, assess which logistics solution best addresses the identified needs and challenges and outline potential use cases by formulating different potential scenarios and identifying potential areas of intervention.

The use case definitions should be based on specific challenges and needs at the stakeholder level and complemented by site visits to the potential implementation areas. This process is highly iterative and may require several approaches, with some stakeholders leaving and new ones joining. It is important to have clear communication around the expected scope of the use case and to be realistic about what can be achieved with existing resources within the project.

Do not be afraid to start over, but have a clear deadline for the end of the definition process to avoid losing time for the actual planning, implementation, and demonstration.

Developing the Use Case & Engagement Roadmap

Translate the defined use cases into a clear project roadmap. Define key phases, responsibilities, timelines, and engagement activities to support coordination and ensure alignment between stakeholders throughout the process. Also define a clear communication strategy for your team, including regular update meetings and key workshops. If you have a large stakeholder group to coordinate, it is best to develop the roadmap with the internal project team first to reduce the workload on the external stakeholders, but plan a validation and update meeting so everyone can contribute.

Market Assessment & Business Model Workshops

Assess whether the proposed use case is viable within the local market and operational context. Analyse the socio-economic conditions, existing logistics landscape, and potential barriers or enabling factors that may influence implementation and long-term success. Based on this, develop the business model and the governance structure, and define the roles and responsibilities of the involved stakeholders. Include the research partners and draw on the baseline assessment during this step.

Regulatory Framework Analysis

Together with the use case stakeholders, assess whether the existing urban planning, mobility strategies, and regulatory frameworks support the implementation of the proposed use cases. This phase helps identify missing measures, regulatory gaps, and enabling factors required to facilitate sustainable LML solutions. Additionally, map regulatory requirements for the implementation and operation of the use case. This phase should also assess whether existing regulations support the implementation or whether adaptations related to vehicle access, public space use, consolidation centres, or logistics operations are needed.

Developing the Implementation Strategy

Translate the theoretical use case into a concrete, practical implementation plan. Define the required operational setup, timeline, responsibilities, and success factors, while identifying potential operational risks and bottlenecks early on. Define a clear governance model for both the implementation and operational phases and hold regular meetings within the implementation team and across the different working groups. Finally, prepare tenders, contracts, and required regulatory adaptations where needed.

Monitoring Meetings

Once implementation starts, maintain regular coordination and meetings with the use case stakeholders to monitor operations, gather feedback, and adapt processes where necessary. Continuous engagement during this phase is essential to identify operational issues early, maintain stakeholder commitment, and assess whether the solution could continue beyond the project duration. Plan for some site visits to document the operations and gather sufficient data and material for both communication and impact assessment.

Evaluation & Impact Assessment Visits

After the operational phase, assess the overall performance and viability of the implemented solution with the use case stakeholders. This includes evaluating operational efficiency, stakeholder satisfaction, economic feasibility, and environmental or social impacts through interviews, surveys, and operational data. Additionally, focus on identifying and documenting lessons learned, and reflecting on the extent to which the use case addressed the challenges and needs mapped at the beginning of the project.

Throughout all phases of the stakeholder engagement roadmap, maintain regular communication with stakeholders. Update meetings, newsletters, workshops, informal discussions, information sessions or site visits help to sustain engagement, manage expectations, and identify implementation challenges early (Figure 6). Communication with participating use case stakeholders should evolve alongside the project and be tailored to the needs of different stakeholder groups.

Practical Tip:

Make sure to include site visits (Figure 10). Site visits and local observations play an important role in understanding the operational realities, spatial constraints, and stakeholder dynamics of the local logistics system. Especially in international projects, they help project partners better understand the local cultural, regulatory, and operational context, supporting more effective communication, trust-building, and stakeholder engagement throughout the project.



Figure 6: Workshop Activity with Stakeholder during the Kick-Off Meeting

USE CASE DEFINITION

Why is it important?

A use case aims to translate the findings of the baseline assessment and stakeholder engagement into a concrete operational solution. It defines what will be implemented, where, by whom, and how the proposed solution will be deployed to address identified local challenges.

A clearly defined use case provides a shared understanding among stakeholders and serves as the foundation for implementation planning, business model development, monitoring, and impact assessment. It also helps ensure that the proposed solutions are realistic, aligned with local needs, and supported by the organisations responsible for operating them.

Objectives

- ✓ Translate identified challenges into realistic and achievable implementation scenarios
- ✓ Align stakeholder needs with available resources
- ✓ Establish the operational scope

Expected Outcomes

- ✓ A clearly defined use case
- ✓ A completed use case definition sheet
- ✓ Business and governance models
- ✓ Cost overview

Developing the Use Case

Developing a use case is an iterative process that combines the findings of the baseline assessment with stakeholder input and local operational knowledge. The steps in Table 8 provide a practical approach to defining realistic and implementable LML solutions.

Table 8: Steps to defining LML solutions

Step	Purpose
Identify Value Proposition	Translate the findings of the baseline assessment into a concrete use case by selecting solutions that address the identified challenges, stakeholder needs, and local implementation opportunities. Clarify the value it creates and who benefits.
Engage Stakeholders	Explore possible solutions, compare existing practices, and select the option that best fits the local context and stakeholder needs. Refine the proposed use case together with key stakeholders, validate its feasibility, and identify operational requirements, potential barriers, and opportunities for improvement.
Define the Minimum Viable Product (MVP)	Clearly define the core use case by specifying the essential features required to test and demonstrate the solution.
Assess Implementation Scenarios & Requirements	Explore different ways the use case could be implemented and assess their technical, operational, and financial feasibility.
Develop the Business Model	Demonstrate how the use case creates value by defining the value proposition, key services, and assessing long-term viability.
Define the Governance Model	Establish how stakeholders will collaborate by defining roles, responsibilities, and decision-making processes.
Assess Costs & Benefits	Evaluate the expected economic, social, and environmental impacts to support implementation and future replication decisions.

Use Case Definition Sheet

To ensure consistency across different implementation sites, it is useful to document each proposed use case using a common template. This helps define the solution's scope, align stakeholder expectations, and support implementation, monitoring, and evaluation throughout the project lifecycle. Table 9 outlines key aspects to be covered.

Table 9: Components of the Use Case Definition Sheet

Baseline Situation	Describe the status quo, highlighting the identified needs and/or challenges.
Planned UC, MVP, & Added-Value Services	Outline the key service or product developed, including a short process description. Specify what is done, where, in what time frame, and with whom. Add a section introducing services that could be added to the core use case to increase its value, for example, reverse logistics.
Value Proposition	Explain how the proposed solution creates value for its intended users and stakeholders. A clear value proposition helps identify the problems it addresses, the expected benefits, and the reasons why stakeholders would adopt or support it.
Governance Model	Indicate which stakeholders will participate, their roles and responsibilities, and which key partners are needed to implement and operate the use case.
Cost Structure	Outline the key cost factors and whether they can be covered by project funding or require external funding.
Regulatory Requirements	Indicate whether any regulatory requirements, tenders, contracts, etc. are needed.
ICT & Equipment Integration	Showcase which software and technical tools will be implemented and how. Highlight what data are needed from each stakeholder and what data will be produced and made available within the process.
Scalability	Showcase whether and how the use case can be scaled up or replicated in the future.

Practical Tip:

The use case definition process is rarely linear. Documenting dead ends, rejected approaches, and the rationale behind changes enables transparency and consistent communication throughout the project. It also creates valuable knowledge for future replication efforts, enabling others to understand what worked, what did not, and why.

Practical Tip:

Whenever possible, build on existing logistics processes, infrastructure, and partnerships rather than creating entirely new systems. Adapting proven solutions often requires fewer resources, reduces implementation risks, and increases stakeholder acceptance. Start with a Minimum Viable Product (MVP) and refine the solution progressively based on operational experience and stakeholder feedback.

Value Proposition Canvas

The Value Proposition Canvas (VPC), shown in Figure 7, is a strategic tool that helps businesses to clearly define how their products or services align with customer needs. By identifying target customer segments and understanding their pains, gains, and desires, the VPC enables stakeholders to craft tailored value propositions, improving product-market fit and overall customer satisfaction.

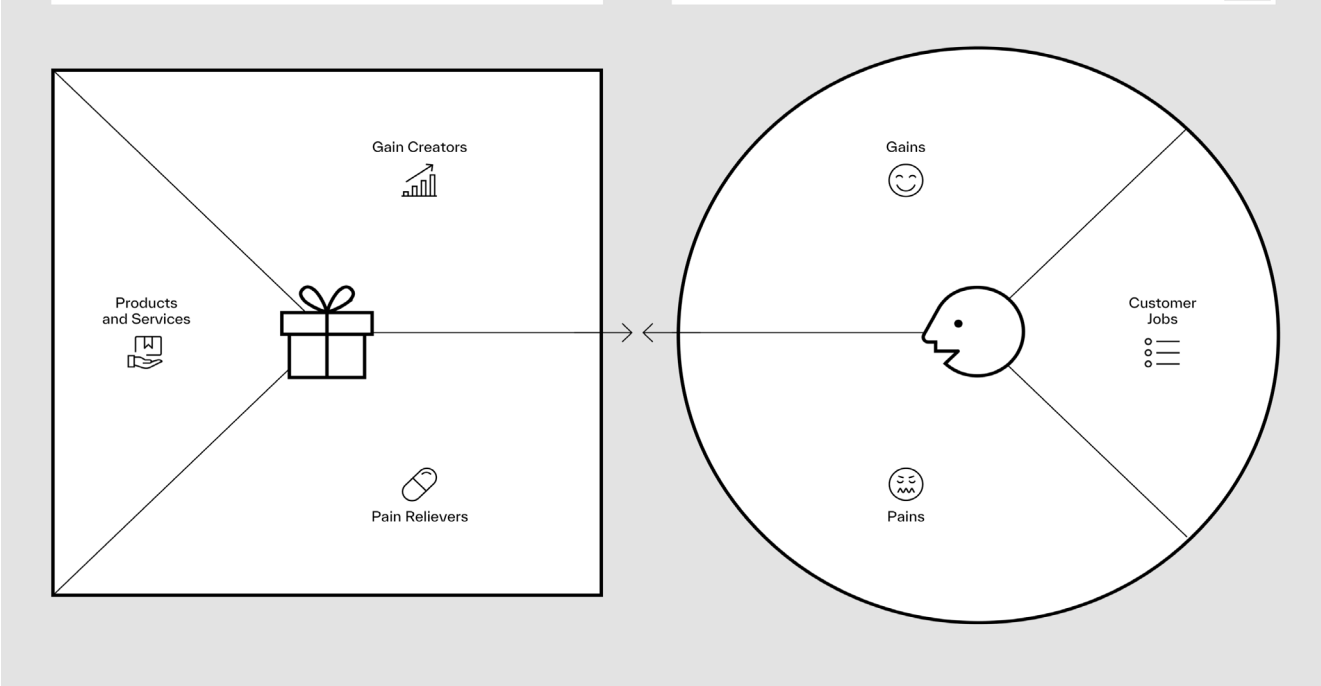


Figure 7: Value Proposition Canvas, Source: Strategyzer.com

Products and Services: List of all products & services around which the value proposition is built

Pain Relievers: How your products or services alleviate customer pains

Gain Creators: How the products or services create customer gains

Customer Jobs: What customers try to get done in their work or their lives

Pains: Bad outcomes, risks, and obstacles they encounter during their jobs

Gains: Outcomes the customers want to achieve or the concrete benefits they are seeking

How to: Work with the VPC

1. Understand the customer by identifying their jobs, pains, and desired gains.
2. Define your offer by listing the products and services your use case provides.
3. Identify how your solution relieves the identified pains and creates the desired gains.
4. Focus on the elements that create the greatest value and validate them with the respective stakeholders.

Find additional information and the template at Strategyzer.com

Business Model

The Sustainable Business Model Canvas (SBMC), shown in Figure 8, is a strategic management tool for defining and identifying the essential business components of a working business model. At its core, the SBMC breaks down a business into essential elements such as value propositions, customer segments, key activities, and revenue streams, and serves as a blueprint for organising operations. By providing a visual overview of the business model, it helps teams to identify risks, opportunities, and areas for improvement. This makes it easier to refine strategies, make informed decisions, and stay competitive.

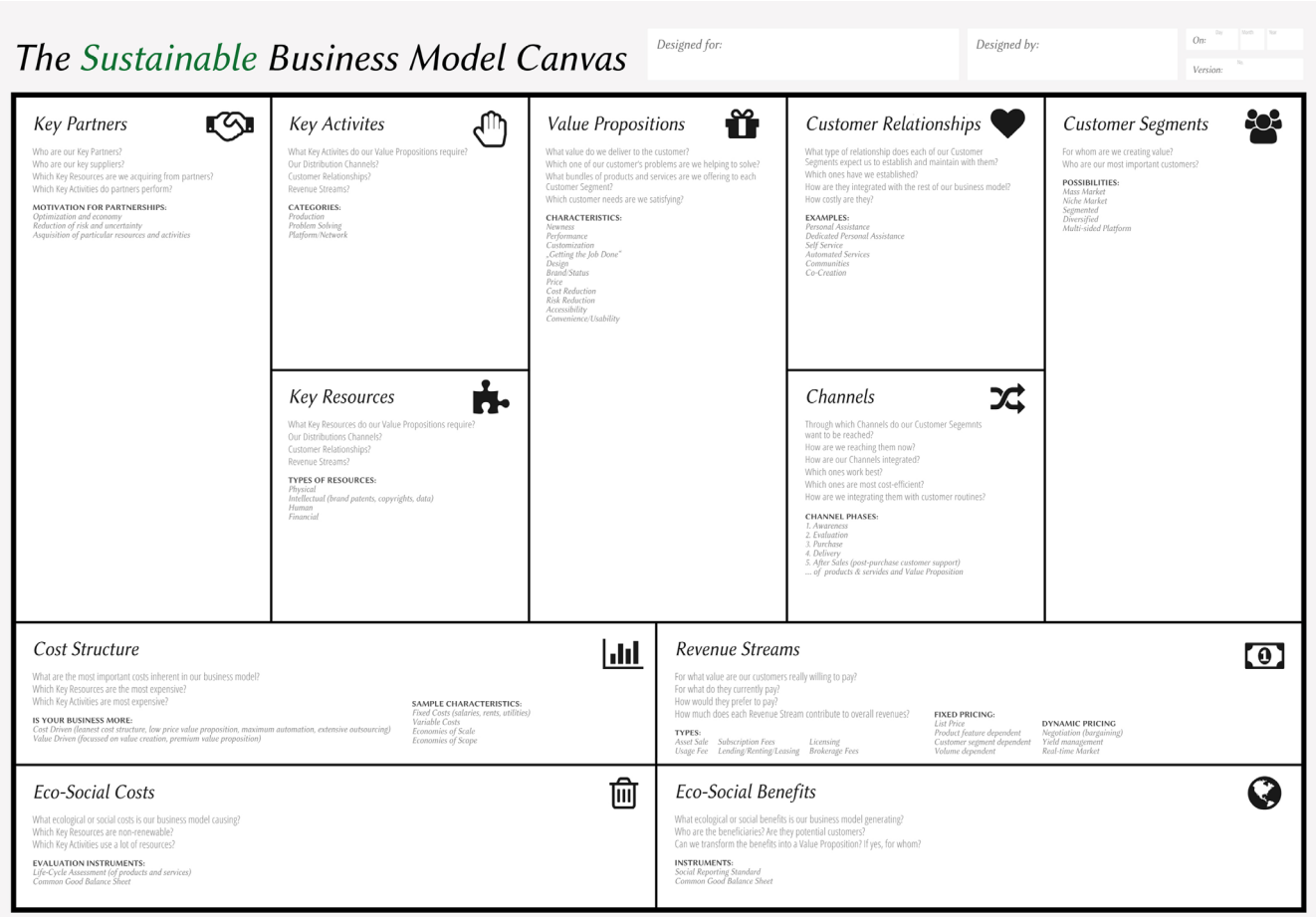


Figure 8: The Sustainable Business Model Canvas, Source: casa-ka.eu

How to: Use the SBMC

1. Build upon the outlined Value Proposition
2. Identify your customers and outline the relationships
3. Outline the key elements of your business (partners, resources and activities)
4. Define the cost and revenue structure
5. Discuss eco-social costs and benefits

Find additional information and the template at case-ka.eu

Practical Tip:

Ensure that you not only create but also validate the proposed business model with the stakeholders who will implement or operate the solution. Their feedback helps confirm feasibility, clarify responsibilities, and identify missing requirements before implementation.

Governance Model

When multiple organisations collaborate to implement and operate a use case, clear governance is essential. A governance model defines who is responsible for what, how decisions are made, and how information flows between the involved stakeholders. This helps avoid unclear responsibilities, duplicated work, missed activities, and information gaps.

Governance structures should be adapted to the complexity of the use case and the number and roles of stakeholders involved. At a minimum, they should provide:

- ✓ Clear roles and responsibilities
- ✓ Transparent decision-making
- ✓ Effective coordination
- ✓ Continuity

The best way to start is by listing all stakeholders involved in the use case operations and all partners needed for implementation and describing their responsibilities. This overview can then be used to develop a detailed governance model, for example by using a RACI matrix as shown in Figure 9.

How to: Use the RACI matrix

The RACI matrix is one practical way to translate the governance structure into clear roles and responsibilities. It shows who is **Responsible (R)**, **Accountable (A), Consulted (C)**, and **Informed (I)** for each key activity, helping avoid unclear ownership and coordination gaps.

How to use the matrix:

1. List key responsibilities without detailing every process step.
2. Define the roles involved in the use case.
3. Assign *R, A, C* or *I* to each role and responsibility.
4. Validate together and communicate the agreed responsibilities to everyone involved.

Find additional information and the RACI template at aihr.com

	Responsibility type	Responsibility Cluster	Responsibility Description	Parcel Carrier	HUB-Manager	Skipper	Barge-Manager	Sluice Operator	LL-Team	Q-Controlling	Logistics Operat	Order Picker
Implementation Phase	Core		Providing of logistic infrastructure for Last Mile Delivery		R				C	A		
	Management	Hub	Intstallation of Micro-Hub		A				C	R	I	
	Management		Ensuring regulatory requirements for the implementation are met						R	C	C	
	Core		Training delivery staff	A	R					C		
	Support	Hub	Prepare the physical space for the UCC /Hub						A	R	C	
	Management		Setting up contracts between DHL and OHB				A		I	I	R	
	Core	Barge	Getting the Barge to Hamburg Port				R		A			
Operational Phase	Core	Barge-Route	Carrying out of the Barge-Route from Grüne Brücke to Stadthausbrücke	I		R	A	C				
	Support	Barge-Route	Providing the necessary personnel for the Barge-Route				R		C			
	Support	Barge-Route	Opening and closing of the necessary floodgates on the Barge-Route					R	A			
	Support	Barge-Route	Providing and managing the necessary infrastructure for loading and and anchoring the Barge			A	R		I			
	Management	Barge-Route	Deciding whether the boat is driving on the current day and which route the Barge will take.	I		R		C	I	I	I	
	Core	Last Mile	Delivering the Parcels to the customer on the last mile	R	A					C		
	Support	Last Mile	Providing the necessary personnel for the last mile delivery		R					A		
	Support	Last Mile	Providing and managing the necessary infrastructure for the last mile delivery		R					A		
	Core	Preparation	Delivering sorted Containers to the Startingpoint of the Barge-Route	I						A	R	
	Core	Preparation	Sorting the parcels into the correct containers	I						A		R
	Core	Preparation	Shipping of empty containers back to the sorting center after the last mile delivery	I						A	R	
	Support	Customer Relationship	Handling Customer Complains and Advice	C	A	A	A		I	R	A	A

Figure 9: Example of a RACI matrix from DECARBOMILE



Figure 10: Site Visit in Hamburg

Cost Sheet & Cost-Benefit Analysis

Defining a clear cost structure is essential for assessing the financial feasibility of a use case and ensuring transparency among project partners. It helps identify the resources required for implementation and operation, clarifies which stakeholders are responsible for different cost items, and supports discussions on funding and long-term sustainability.

A cost sheet is a practical tool that supports this process by estimating, monitoring, and comparing costs and revenues throughout the lifecycle of a use case. It should distinguish between investment costs, which occur during implementation, and operational costs, which occur during operation. Where relevant, it may also include costs associated with additional value-added services.

For each cost category, organisations should also identify the funding source (e.g., project funding, partner contributions, public or private funding, or other local investments), enabling a transparent overview of how implementation and operational costs will be financed. Comparing the baseline, planned, and actual costs and revenues also provides the basis for evaluating the overall viability of the use case. The level of detail should reflect the complexity of the proposed solution and be adapted to the specific characteristics of each use case. Table 10 presents indicative cost categories that can be adapted to different types of LML solutions.

Table 10: Cost Categories

Investment Costs	Operational Costs
One-time costs required to establish the use case	Recurring costs required to operate, maintain, and manage the use case
• Development of equipment (hardware & software) • Training and testing • Purchase of vehicles and hardware equipment • Installation of infrastructure and facilities • Charging infrastructure • Permits and authorisations	• Personnel • Maintenance and repairs • Energy and utilities • Software licences and support • Insurance • Administration • Monitoring and data management • Rent for infrastructure and equipment • Communication

The completed cost sheet can provide the basis for the Cost-Benefit Analysis (CBA) outlined in Table 11. By comparing the baseline situation with the planned and actual implementation, project partners can assess whether the proposed use case delivers the expected financial, operational, social, and environmental benefits.

Table 11: Key Components of CBA

Key Components of the Cost-Benefit Analysis	
Baseline Situation	Document the existing operation, including operational activities, vehicles, existing costs, and revenues before implementation.
Planned Use Case	Estimate the planned operations, vehicles, revenues, and costs (including investment and operational costs).
Actual Use Case	Record the actual operations, vehicles, revenues generated, and costs incurred during implementation.
Social & Environmental Impact	Estimate transport externality costs associated with the use case, such as air pollution, climate change, noise, congestion, and road risk, where relevant.
Cost-Benefit Balance	Compare the total costs, revenues, and transport externality costs to determine the overall cost-benefit balance and financial viability of the use case.

Use Case Action Plan

Once the use case has been outlined, translate it into a Use Case Action Plan, as exemplified in Table 12. Acting as the bridge between use case definition and implementation, the Action Plan converts the proposed solution into a structured set of activities. Using a simple spreadsheet or project management tool, identify and categorise all actions needed to finalise the use case, define milestones, assign responsibilities, and plan the meetings, resources, and key decisions required before implementation begins.

Table 12: Use Case Action Plan Example from DECARBOMILE

Milestone	Task	Deadline	Responsible
Stakeholder Identification	Map relevant stakeholders		
	Identify their needs and challenges		
	Identify stakeholders' expectations		
	Identify their potential roles within the use case		
Use Case Description	Identify the baseline situation		
	Analyse the baseline situation		
	Describe the use case		
	Set performance indicators corresponding to the use case actions		
	Identify added-value side services		
	Identify possible alternative/additional scenarios for the use case		
	Identify similar successful use cases to showcase		
Hub Definition	Define the hub's location		
	Choose and define the hub's type		
Delivery Process Definition	Define delivery range/area		
	Map delivery routes and geographical scope		
	Define the mode of transport		
	Define (un)loading process(es)		
Resource Definition	Define the required hardware equipment		
	Define the required software (ICT tools)		
	Define the required data		
	Plan data security process		
	Pre-define the required human resources		
	Pre-define the required financial resources		
	List permits and agreements needed		
	Identify logistics operators		
	Incorporate success factors in the urban logistics strategies		



Figure 11: Stakeholder Activity in Nantes

Contextual Factors Affecting Collaborative Use Case Development

The success of the use case development and implementation process depends not only on the quality of the proposed solution, but especially on how well the use case fits the local Living Lab context. Experience from the DECARBOMILE Living Labs shows that collaborative use case development is influenced by the interactions among the Living Lab environment, the stakeholder landscape, and the characteristics of the proposed use case (Figure 12). Each dimension includes factors that can either facilitate or hinder the collaborative development and implementation of a use case (Table 13).

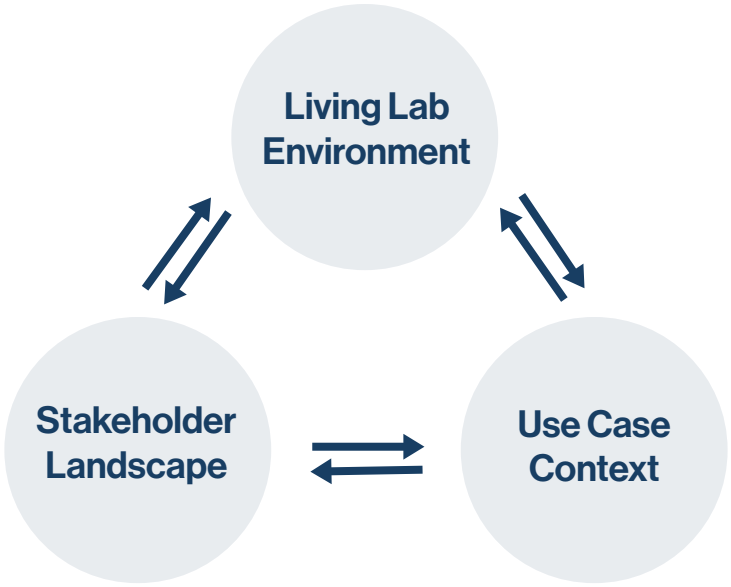


Figure 12: Living Lab Components

It is important not only to treat the dimensions individually but also to consider how they interact. The objective is not to optimise each dimension individually, but to achieve an appropriate balance between the ambition of the use case, the local implementation context, stakeholder capacity, and the project framework. For each barrier identified, you should consider whether it is counterbalanced by another factor.

The objective should not be to maximise the ambition of the use case, but to maximise the fit between the use case, the Living Lab context, the stakeholder landscape, and the resources available within the project. The three main questions to pose are:

1. **Does the required engagement strategy align with the stakeholder landscape?**
   Consider whether stakeholders have the commitment, organisational capacity, and resources required to support the intended level of collaboration for the use case.

2. **Does the proposed use case fit within the Living Lab environment?**
   Assess whether the local regulatory framework, infrastructure, political support, and socio-economic conditions enable the proposed level of implementation or require the use case to be adapted.

3. **Does the proposed use case fit the project's resources and timeline?**
   Ensure that the ambition of the use case can be delivered within the available budget, project duration, consortium expertise, and implementation capacity.

Table 13: Overview of contextual factors as identifed in "Barriers and facilitators of multistakeholder collaboration in urban living labs: A case study of DECARBOMILE" (Hauswald et al, forthcoming)

	Factor	Definition	Barrier	Facilitator
Living-Lab Environment	Political & Economic Stability	Stability and supportiveness of the political and economic context for achieving the LL's goals	Unstable political and economic context	Stable economic and political context
	Infrastructure & Resource Availability	Accessibility, functionality, and sufficiency of the LML infrastructure and resources	Limited or no access of LML infrastructure and/or resources	High accessibility to LML infrastructure and/ or resources
	Sustainability Commitment	Extent to which the LL demonstrates an active adaptation of its practices towards more sustainable approaches	No or minimal visible adaptation of sustainable practices	Sustainability practices are actively embedded
	Regulatory Landscape	Level of complexity, fragmentation, and time requirements associated with navigating relevant regulations	High level of bureaucracy and regulatory fragmentation	Low level of bureaucracy and regulatory fragmentation
Stakeholder Landscape	Sustainability Commitment	Extent to which stakeholders demonstrate active incorporation of sustainability into operations and decision-making	Low interest and awareness, and limited or no adaptation	High adaptation of sustainable practices
	Project Commitment	Extent to which stakeholders are dedicated to the project	Low commitment, with the right to withdraw at any point	High and stable commitment throughout the project duration
	Openness towards Collaboration	Willingness to work together, share resources, operations, data, and engage in joint problem-solving	Strong competitiveness amongst stakeholders	Active seeking of collaboration amongst stakeholders
	Organisational Boundaries	Capacity of stakeholders to actively contribute, including time, personnel, and financial resources, and access to necessary infrastructure or expertise	Limited capacity and availability of resources	High and consistent capacity and availability of resources
	Complexity	Diversity of stakeholders (agenda variety, organisational boundaries, etc.), level of fragmentation in the stakeholder landscape	High diversity and fragmentation	Low diversity and fragmentation
Use Case Context	Compatibility	Extent to which UC aligns with the LL contextual situation, including regulatory framework, existing solutions, and available resources	Weak alignment with the contextual situation	Strong alignment with the contextual situation
	Economic Viability	UC financial feasibility (short- and long-term)	Low to no financial feasibility	High financial feasibility
	Operational Complexity	The scope and manageability of UC operation, including the number of operational steps and stakeholders involved	High operational complexity	Low operational complexity
	Innovation Level	Degree of novelty and experimentation versus adaptation and/or service and tool replication	High use of innovative and experimental approaches	High level of replication or adaptation of existing solutions
	Added Value	The extent to which the UC generates clear, tangible value for participating stakeholders	Limited to no direct added value	High and direct added value
	Definition Clarity	The extent to which an exploratory approach is utilised for the UC definition	Highly exploratory approach for the UC definition	Limited exploratory approach for the UC definition

ICT TOOL DEVELOPMENT

Why is it important?

Digital technologies play an important role in enabling efficient, collaborative, and data-driven LML operations. ICT tools support planning, monitoring, communication, and operational decision-making, helping stakeholders improve efficiency while reducing environmental impacts. Rather than being standalone solutions, ICT tools should support clearly defined operational needs and be integrated with existing logistics processes wherever possible. The DECARBOMILE project developed and demonstrated a range of ICT and IoT solutions to support these functions. This chapter focuses on the process of selecting, integrating, and operating ICT solutions rather than on the technical specifications of individual tools.

Objectives

- ✓ Identify digital needs
- ✓ Develop technical tools and software solutions to support operation and monitoring
- ✓ Collect data
- ✓ Test solutions and train users
- ✓ Facilitate data-driven decision-making

Expected Outcomes

- ✓ Selected digital tools
- ✓ Tool implementation plan
- ✓ Agreed data-sharing standards
- ✓ Tested interoperability
- ✓ Trained users

ICT Integration Process

Successful ICT integration requires a structured approach that aligns digital solutions with operational needs throughout the project lifecycle. The process in Table 14 outlines the main phases to consider when planning and implementing ICT solutions for sustainable LML.

Table 14: ICT Integration Phases

Step	Objective	Purpose
Assessment & Planning	Understand operational needs, digital readiness, and existing infrastructure	Review current logistics operations and ICT systems, assess data availability and quality, identify stakeholder requirements, define objectives, responsibilities, milestones, and an implementation roadmap.
Technology Selection & Integration	Select ICT solutions that best support the use case and local operational context	Compare available technologies, assess interoperability, customise tools where needed, define data requirements, and plan integration with existing systems.
Deployment & Validation	Validate ICT tools before full deployment and ensure seamless integration	Conduct pilot testing under real-life operating conditions, integrate systems, establish common data structures and standards, validate data quality, perform interoperability checks and automated system checks, and refine solutions based on operational feedback.
Training & Continuous Support	Ensure successful adoption and long-term use of the ICT solutions	Deliver user training and demonstrations, provide technical support, collect user feedback, monitor system performance, and continuously improve the solutions during operation.

Practical Tip:

Start simple and build incrementally. Rather than implementing multiple ICT solutions simultaneously, prioritise the tools that directly support the selected use case. Test individual components under operational conditions before integrating them into a wider digital ecosystem.

Key Considerations

Experience from DECARBOMILE highlighted several practical considerations that can improve the successful integration of ICT tools into LML operations. While technologies will vary across projects, the recommendations shown in Figure 13 are broadly applicable across implementation contexts.

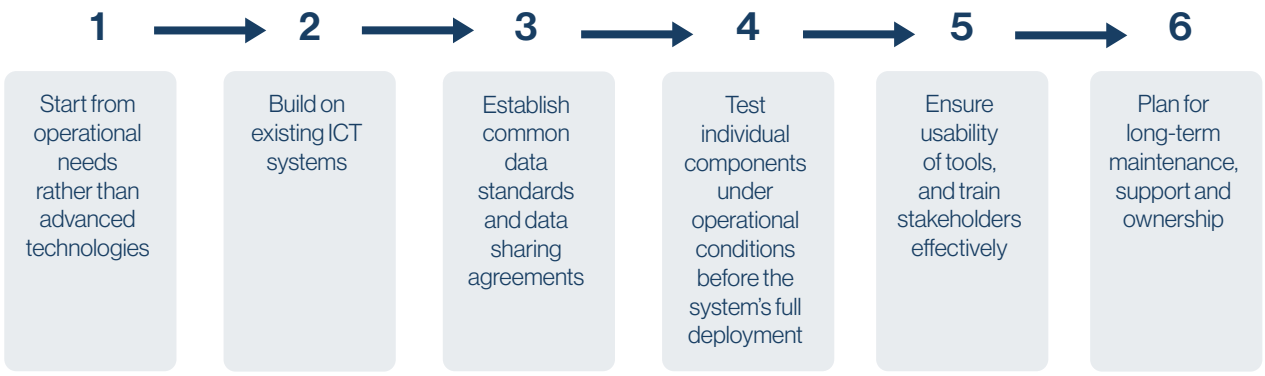


Figure 13: Key considerations for successful ICT integration

Data Standardisation

When multiple organisations are involved, agree on common data structures, interfaces, and governance procedures from the start. This facilitates data exchange, improves interoperability, and prevents costly integration challenges later.

ICT Readiness Checklist

Before deploying ICT solutions, it is useful to assess whether the necessary technical, organisational, and operational conditions are in place. The checklist shown in Table 15 can help identify potential gaps and ensure that the project is ready for successful ICT implementation.

Table 15: ICT Readiness Checklist

Question	Status
Are the operational needs clearly defined?	
Is the required data available?	
Are stakeholders willing to share data?	
Are existing systems compatible?	
Are interoperability requirements defined?	
Have data-governance and ownership responsibilities been agreed?	
Have the usability of the tools been tested?	
Have users been trained, and/or are there sufficient user manuals available to explain the tools' interface and functions?	
Is technical support available?	

PREPARATION & IMPLEMENTATION

Why is it important?

Once the use case has been defined and the necessary stakeholders have been engaged, the focus shifts from planning to implementation. This phase translates the proposed concept into an operational solution by preparing the required infrastructure, equipment, technologies, regulatory conditions, and organisational arrangements for deployment (Figures 14 and 22).

Successful implementation requires more than installing new infrastructure or digital tools. It involves coordinating multiple stakeholders, ensuring compliance with local regulations, integrating the solution into existing urban logistics systems, and establishing a clear implementation roadmap. Early preparation helps identify potential risks, secure the necessary resources, and ensure that the demonstrator can operate effectively under real-world conditions. Thus, this phase is about ensuring that the selected use cases can be deployed efficiently, safely, and in accordance with local operational and regulatory requirements.

Objectives

- ✓ Prepare the operational environment
- ✓ Embed the use case within existing regional and national mobility strategies
- ✓ Identify requirements for equipment and infrastructure
- ✓ Outline an implementation roadmap

Expected Outcomes

- ✓ Implementation roadmap
- ✓ Completed regulatory and procurement preparations
- ✓ Defined operational procedures, responsibilities & risks
- ✓ Prepared infrastructure and tools

Assessing Implementation Complexity

One useful approach for transitioning from the planning phase to implementation is to conduct a Time-to-Market assessment (Table 16). Time-to-Market is defined here as the time required to implement a developed use case concept and make it fully operational. It is about understanding what already exists and what still needs to be established to estimate the time, resources, and coordination required to implement the use case. Rather than predicting an exact implementation date, this assessment helps identify critical dependencies, potential bottlenecks, and resource requirements early in the preparation phase. It allows project partners to develop realistic implementation roadmaps, allocate responsibilities, and anticipate risks before deployment begins.

Table 16: Time-to-Market Assessment Questions

Infrastructure Availability	Can existing infrastructure support the proposed use case?
Regulatory Approvals	Are permits or legal approvals required? How complex and time-consuming are these processes?
Partnerships & Stakeholders	Are the necessary partners committed and aligned with the needs of the use case?
Equipment & ICT Integration	Does new equipment require additional development or testing? Are the required ICT systems available and interoperable?
Resource Availability	Are staff, equipment, and materials available? Could shortages create delays?
Costs & Finances	Are sufficient financial resources available?
Environmental & Geographical Factors	Are there external conditions that could delay implementation (or deployment)?

Infrastructure Requirements

Once implementation readiness has been assessed, the next step is to identify the requirements for the necessary infrastructure to be deployed. While this is highly context-specific, some requirements identified during DECARBOMILE should be considered when selecting appropriate hub structures and locations, as well as delivery vehicles (Table 17).

Table 17: Technical Requirements & Social Considerations

Objective	Purpose
1. Vehicle circulation (slopes and gyration) 2. Headroom height 3. Vehicle parking 4. Handling and operations space 5. Horizontal and vertical movement 6. Fire safety and security rules	1. Loading capacity 2. Energy source and charging/refuelling 3. Maintenance requirements 4. Compatibility with delivery routes 5. ICT integration 6. Loading equipment / infrastructure 7. Suitability for weather and geographical conditions 8. Safety and communication tools
Social Considerations	
1. Seamless integration into the surrounding urban environment and community 2. Safe and ergonomic working conditions, e.g., ergonomic design of vehicles, equipment, and handling processes to reduce physical strain and improve occupational health 3. Adequate staff facilities, e.g., sanitary facilities, rest areas, and changing rooms where appropriate 4. Inclusive design for diverse users and the workforce, considering gender, age, and physical abilities	

Legal Authorisation

Successful implementation depends not only on technical readiness but also on regulatory compliance. Before deployment, review the legal, administrative, and policy framework that may influence the proposed use case. Depending on the complexity of the use case and the local regulatory environment, obtaining the necessary approvals and permits can take considerable time. Therefore, identifying regulatory requirements early helps prevent delays, clarify responsibilities, and ensure that the solution can be implemented and operated within the local context (Table 18).

Start by identifying the authorities and organisations responsible for regulating or approving the proposed use case. Together with the relevant stakeholders, review the strategic, regulatory, operational, and project-specific requirements that may affect implementation. Integrate any required permits, approvals, contracts, or regulatory actions into the implementation roadmap to ensure they are completed before demonstration.

Table 18: Legal Authorization & Requirements

Requirements	Purpose	Example
Strategic Alignment	Ensure the use case supports local and regional strategies	SUMP, Sustainable Urban Logistics Plan, Climate Action Plan, Smart City Strategy
Spatial & Regulatory Requirements	Verify that the proposed infrastructure and locations comply with local planning and regulatory requirements	Building permits, heritage/monument protection, public space occupation, planning permission, environmental permits, utility connections, hub approvals
Operational Requirements	Ensure the planned operation complies with local transport and logistics regulations	Low-emission zones (LEZs), delivery windows, vehicle access restrictions, loading and unloading regulations, parking, vehicle certification
Implementation Alignment	Ensure the project is organisationally and legally ready for deployment	Procurement, tenders, contracts with operators, NDAs, data-sharing agreements, insurance, health & safety, governance arrangements
Future Policy Development	Identify regulatory gaps that may require future policy changes	Recommendations for new regulations, incentives, integration into future mobility and logistics strategies



Figure 14: Electric Delivery Vehicle - Hamburg

Implementation Roadmap

Once the preparation activities are mapped, they should be consolidated into an implementation roadmap. The roadmap defines the key activities, responsibilities, and milestones required before and during deployment, ensuring that all operational, technical, and administrative tasks are completed in a coordinated manner. Table 19 provides examples of activities and actions.

Table 19: Implementation Roadmap Example from DECARBOMILE

Phase	Activity	Key Actions
Use Case Preparation & Implementation	IT Implementation Process	Prepare IT tool implementation
	Hub Installation Process	Plan the hub's interior and exterior
		Plan installation process
		Acquire the permits needed for the installation
		Define hub governance model
	Vehicle & Equipment Preparation	Develop technical equipment needed
		Decide on the vehicle model and quantity
		Define vehicle's acquisition method: rent/buy
		Define storage options
		Integrate ICT tools with vehicles and equipment
	Delivery Route Definition	Define route schedule
		Outline the permits needed
	Authorisation Process	Define legal framework (what & who)
		Clarify permits and authorisation
		Ensure that all necessary permits have been acquired
		Obtain written stakeholders' agreement
	Business Model	Finalise the SBMC and validate roles and responsibilities
	Marketing Plan	Define target group
		Define marketing and communication tools
	Evaluation Process	Define evaluation criteria
		Set relevant KPIs
	Budget	Set budgets for the use case
	Security Framework	Plan security during transport
		Plan for employee safety
		Safety protocols for equipment handling
		Plan how to protect resources
	Insurance Plan	Develop insurance plan to cover location, vehicle, and transport
		Plan employees' insurance
	Recruitment Process	Define the profile of the employees needed
		Outline the recruitment process
		Draft and plan the job announcements
	Training process	Outline the training process
		Plan the feedback process

Phase	Activity	Key Actions
Implementation of the Use Case	Hiring Process	Hiring of staff
	Legal framework	Ensure all contracts / agreements are in place and finalised
		Conclude insurance contracts with the UC stakeholders
	Employee Training	Train the loading and unloading process
		Train usage of hardware & software equipment
		Install the hub
		Provide vehicles
		Install ICT tools needed and implement software solutions
		Implement on-site infrastructure

Practical Tip:

Establish a small use case coordination team with complementary expertise (e.g., logistics, business models, ICT, and local implementation) to ensure cross-sectoral support throughout the definition process. This helps ensure that technical, operational, and organisational aspects are considered throughout the development process. Regularly update the use case definition sheets as new information, stakeholder feedback, and implementation decisions evolve.



Figure 15: Implementation Preparation Workshop in Nantes

Potential Operational Risks

Successful demonstration depends not only on careful planning but also on anticipating potential operational challenges. Conducting a simple operational risk assessment helps identify factors that could delay, disrupt, or reduce the effectiveness of the use case, allowing mitigation measures to be planned in advance.

One practical approach is to organise a brainstorming session with the project partners and key stakeholders to identify potential risks associated with the use case's implementation and operation. These may include technical failures, procurement delays, regulatory barriers, stakeholder withdrawal, data availability issues, or unexpected operational constraints.

As indicated in Figure 16, each identified risk should then be assessed according to two criteria:

- **Likelihood:** How likely is the risk to occur?
- **Impact:** If it occurs, how significantly would it affect the operation of the use case?

Plotting the identified risks in a simple Impact-Likelihood Matrix helps prioritise mitigation efforts and focus resources on the most critical risks before implementation begins. This enables the definition of suitable mitigation strategies beforehand, making the demonstration more resilient to challenges. It is recommended to focus especially on high-impact/high-likelihood and high-impact/low-likelihood risks, and to communicate defined mitigation strategies across the operational team.

Activity: Operational Risks

Place each risk identified within the Impact-Likelihood Matrix. Indicate:

1. How likely is it to happen?
2. How much would it affect the operation?

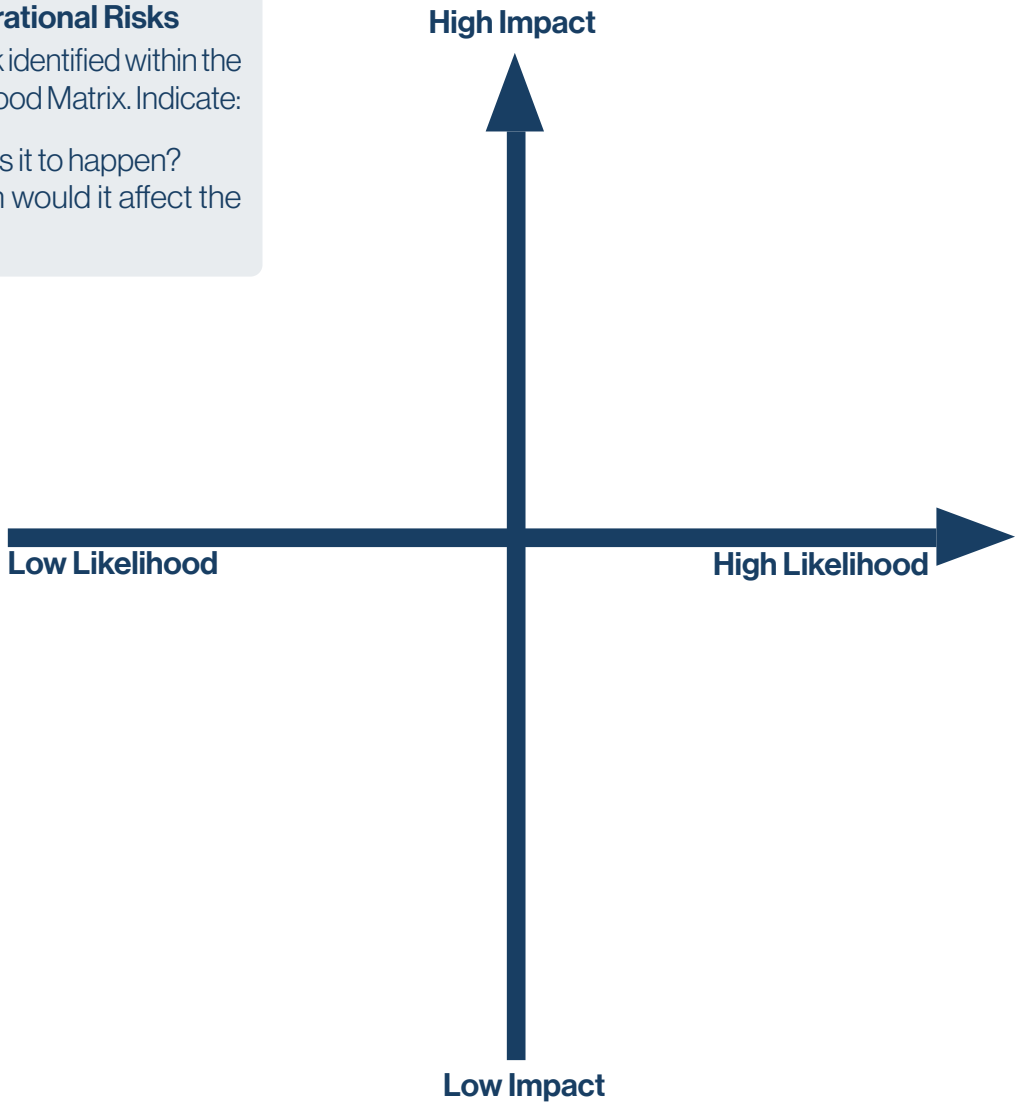


Figure 16: Impact-Likelihood Matrix - Operational Risk Activity

DEMONSTRATION PHASE

Why is it important?

The demonstration phase is where the use case is tested under real operating conditions. It provides the opportunity to validate the technical solution, assess operational performance, identify unforeseen challenges, and collect the evidence needed for the impact assessment (Table 20). Rather than proving a perfect solution, the demonstration should generate practical knowledge that supports refinement, replication, and long-term implementation (Figures 17-20).

Objectives

- ✓ Validate the use case under real operating conditions
- ✓ Monitor technical and operational performance and collect data
- ✓ Identify operational challenges and opportunities for improvement
- ✓ Outline an implementation roadmap

Expected Outcomes

- ✓ Operational performance data from all use cases
- ✓ Overview of challenges encountered
- ✓ Assessment of use case success

Table 20: Demonstration Phase Process

Step	Purpose
Anticipate Challenges	Ensure that mitigation strategies are defined for the key operational risks identified for the demonstration phase.
Operate the Use Case	Run the demonstration under real operating conditions while following the agreed operational procedures.
Monitor Performance	Collect operational, technical, and stakeholder data throughout the demonstration phase.
Review and Optimise	Regularly evaluate results, discuss challenges with stakeholders, and implement improvements where appropriate.

Practical Tip:

Demonstrations rarely operate exactly as planned. Use unexpected events and operational challenges as learning opportunities rather than failures. Recording adaptations throughout the demonstration often provides the most valuable lessons for future replication.

Practical Tip:

Use demonstrations to assess and validate earlier assumptions/hypotheses related to the use case, not only to test technologies.

Monitoring

Effective monitoring is essential for evaluating the use case's performance, identifying operational issues, and generating reliable evidence for impact assessment. To ensure consistent, high-quality data throughout the demonstration phase, the aspects shown in Table 21 should be considered.

Table 21: Monitoring Recommendations

Recommendation	Purpose
Assign a monitoring lead	Designate one partner to coordinate data collection, monitor data quality, and manage the overall monitoring process.
Clearly define responsibilities	Specify which partners are responsible for operating monitoring devices, maintaining them, cleaning data, and providing datasets for analysis.
Keep data collection simple	Select monitoring devices that are easy to install, operate, and maintain to minimise disruption to daily operations.
Enable flexible data collection	Allow monitoring devices to be activated or deactivated when needed (e.g., to address privacy requirements or when vehicles are used outside the pilot).
Monitor device performance	Implement automated health checks and alerts to quickly identify missing or faulty data and minimise downtime. Technical support should be available to resolve issues promptly.
Standardise data formats	Use a common data structure across all pilots to simplify data integration, comparison, and impact assessment.
Ensure data security	Perform regular automatic backups and keep spare monitoring equipment available to minimise data loss and reduce disruptions.
Facilitate data sharing	If multiple partners rely on monitoring data, establish an efficient data-exchange mechanism (e.g., an API or shared platform) and organise regular coordination meetings.
Visualise progress	Use dashboards to provide an overview of operational performance, data availability, and key monitoring indicators.
Combine multiple data sources	Complement sensor or monitoring device data with operational data (e.g.,Transport Management Systems, delivery records, or fleet management systems) to enrich the analysis and validate results.

Alongside quantitative monitoring, qualitative documentation, as listed in Table 22, helps capture operational experiences, implementation challenges, and lessons learned that may not be reflected in the monitoring data alone.

Table 22: Qualitative Documentation Methods

Documentation Methods	
Living Lab Diaries	Record implementation progress, key decisions, and notable events throughout the demonstration.
Operator Logbooks	Capture day-to-day operational experiences, issues encountered, and adaptations made during the pilot.
Workshop & Focus Group Summaries	Document stakeholder feedback, user experiences, and lessons learned.
Maintenance & Incident Logs	Record technical issues, repairs, and system downtime that may influence pilot performance.



Figure 17: Microhub in Logroño



Figure 18: MIGROS E-bike delivery in Istanbul



Figure 19: Loading operations in Nantes



Figure 20: DPDHL Waterlogistics in Hamburg

EVALUATION & IMPACT ASSESSMENT

Why is it important?

An impact assessment evaluates the real-world effects of the use cases and generates clear, practical evidence on usability, economic viability, and ecological benefits. By comparing the outcomes to the baseline, it helps to confirm whether the implemented solution achieved its intended objectives and provides evidence to support future investment, replication, or scaling. Beyond demonstrating project success, it helps identify what worked well and what should be improved. Finally, it enables the extraction of key lessons learned from the project.

Impact Assessment: Did the solution achieve its objectives? (KPIs)
Lessons Learned Framework: Why did it succeed or struggle, and what should future projects do differently?

Objectives

- ✓ Benchmark the results against the baseline situation
- ✓ Evaluate the use case impact and success
- ✓ Collect lessons learned
- ✓ Develop recommendations for future implementation and replication

Expected Outcomes

- ✓ Comprehensive Impact Assessment
- ✓ Evidence of environmental, economic, social, and operational impacts
- ✓ Key lessons learned and recommendations
- ✓ Feasibility assessment

What Impacts should be assessed?

A comprehensive assessment should compare the implemented solution against the baseline established at the beginning of the project. This enables stakeholders to quantify improvements rather than relying on assumptions. Sustainable LML should be evaluated from three complementary perspectives.

1. **Environmental Assessment:** Measures the solution's environmental impacts, such as emissions, energy consumption, air quality, and congestion.
2. **Economic Assessment:** Evaluates the solution's operational performance, costs, revenues, and long-term financial viability.
3. **Social Assessment:** Assesses stakeholder acceptance, user experience, safety, working conditions, and the potential for long-term adoption.

The assessment should answer questions such as:

- Did the solution reduce environmental impacts?
- Did it improve operational performance?
- Is it economically viable?
- Was it accepted by stakeholders and users?
- Should the solution be continued or replicated elsewhere?

Conducting the Impact Assessment

The impact assessment should be planned as a structured process that starts before implementation and continues throughout the operational phase. The following steps provide a practical approach for defining what to assess, collecting the necessary evidence, and evaluating the results.

Step 1: Define the Objectives

Start by identifying what you want to evaluate. The assessment should reflect the objectives of the use case. For example, if the aim is to reduce emissions, environmental indicators should be prioritised. If the objective is to improve delivery efficiency or test a new business model, operational and economic indicators become more relevant.

Step 2: Establish the Baseline

Measure the current situation before implementation. The baseline provides the reference point against which project impacts will be evaluated. Depending on the use case, this may include operational performance, costs, emissions, stakeholder satisfaction, or service quality.

Step 3: Select Key Performance Indicators (KPIs)

Choose a manageable set of indicators that directly measure whether the objectives have been achieved. Avoid collecting data simply because it is available. Instead, focus on indicators that provide meaningful evidence of project performance.

Step 4: Plan Data Collection

Identify what information is required, where the data is stored, who owns the data, how it will be collected, and how frequently it should be updated. Assign responsibilities for data collection before implementation begins to ensure consistent monitoring throughout the project.

Step 5: Monitor Implementation

Collect data continuously during the operational phase rather than waiting until the project has ended. Regular monitoring allows operational issues to be identified early and provides more reliable evidence of project performance.

Step 6: Analyse & Communicate the Results

Compare the monitored results with the baseline to evaluate environmental, economic, and social impacts. Present the findings clearly and translate them into practical recommendations that can support future implementation, scaling, or replication.

Data Collection

Impact assessment should combine both quantitative and qualitative data to provide a comprehensive understanding of the use case's performance (Table 23). Whenever possible, use existing operational data collected during the demonstration and complement it with stakeholder feedback.

Before Use Case Demonstration	During Use Case Demonstration	After Use Case Demonstration
Baseline indicators --> Baseline Assessment	Operational monitoring, Stakeholder feedback, observations	Final interviews, KPI comparison, lessons learned

Table 23: Data Requirements & Sources

Information Needed	Typical Data	Main Provider
Operational Data	Number of deliveries and their weight, routes, vehicle kilometres, travel time, load factor, delivery success rate	Logistics operators and service providers
Vehicle & Energy Data	Fuel or electricity consumption, vehicle type, charging information, maintenance records	Logistics operators, fleet managers
Hub & Infrastructure	Hub utilisation, storage capacity, energy consumption, occupancy rates, driver services (toilets, water, etc.)	Hub operators, infrastructure providers, municipalities
Environmental Data	Emissions, air quality, congestion, traffic	Municipalities, environmental agencies, transport authorities, logistics service providers
Economic Data	Investment costs, operating costs, maintenance costs, revenues, staffing costs	Project partners, logistics operators, financial managers
Social Data	User satisfaction, employee feedback, stakeholder acceptance, perceived usability	Users, employees, use case stakeholders
Policy & Planning Information	Regulatory changes, permits, public-space use, policy objectives	Local authorities, municipalities

Practical Tip:

Record not only successful practices but also why specific approaches did not work. Understanding why decisions were unsuccessful is equally valuable for future replication.

How To Collect Data

Data can be collected through a combination of methods, depending on the information needed and the stakeholders involved. The methods in Table 24 can be used together to combine operational evidence with stakeholder experience and feedback.

Table 24: Data Collection Methods

Method	Purpose
Workshops	Reflect jointly on implementation experiences, successes, and challenges.
Interviews	Capture detailed experiences and recommendations from key stakeholders.
Surveys & Questionnaires	Collect structured feedback from operators, users, and project partners.
Site Visits & Observations	Assess operational workflows, infrastructure use, and real-world challenges.
Operational Data & Project Documentation	Combine monitoring data with meeting notes, operator logbooks, and incident reports to validate findings.

Reporting Results & Lessons Learned

The purpose of the assessment is not only to demonstrate project performance but also to communicate lessons learned and provide recommendations for future implementation. These can be extracted from the documentation of the demonstration phase and collected as part of the assessment after the demonstrations have concluded (Table 25).

Table 25: Reflection Areas for Lessons Learned

Reflection Area	Questions to Consider
Operations	Did the use case operate as planned? What worked well? Which operational challenges occurred?
Infrastructure	Was the infrastructure suitable and sufficient? Were changes or additional facilities required?
Personnel	Were staffing levels, skills, and training sufficient? Were there any health, safety, or operational challenges?
Costs	Were implementation and operational costs in line with expectations? Which costs were underestimated or unexpected?
Collaboration & Governance	Were stakeholder roles and responsibilities clear? How effective was the collaboration between partners?
Business Model & Added Value	Did the use case create value for the participating stakeholders? Is the business model viable beyond the project?
Digital Infrastructure & ICT Tools	Did the digital tools perform as expected? Were there issues with interoperability, data sharing, or usability?
Urban Integration & Space Management	Did the solution integrate well into the urban environment? Were there challenges related to public space, accessibility, or local acceptance?
Regulations	Which regulatory barriers were encountered? What changes or approvals would facilitate future implementation?

Long-Term Feasibility Assessment

Towards the end of the demonstration, evaluate whether the use case can continue beyond the project. Consider the technical, organisational, regulatory, and financial conditions required for long-term operation. One way to conduct this assessment is to use the activity outlined in Table 26 to discuss with stakeholders which barriers remain, what resources are needed, and whether adaptations are required to support wider deployment or replication after the project ends.

Table 26: Long-term Feasibility Assessment Tool

Activity: Long-Term Perspective Discuss: Is the long-term implementation of the use case realistic? Why/ Why not? TO-DO: Use sticky notes to collect (1) hindering factors and (2) necessary conditions.	
Hindering Factors	**Necessary Conditions**

PLANNING ANALYSIS FRAMEWORK

Evaluating a Living Lab should go beyond measuring impacts or listing barriers and success factors. Many LML projects identify implementation challenges, but often without analysing the underlying reasons or the relationships between different elements of the project. As a result, recommendations remain generic and are difficult to transfer to new contexts.

The Planning Analysis Framework (PAF) (Figure 21) developed by Flämig (2004)* provides a structured approach to analysing not only what has happened, but also why it happened. It uses a mixed-method approach to enable a broader systemic evaluation. It examines the planning process, stakeholder interactions, implementation measures, and achieved impacts together, identifying the conditions that influenced implementation success to support the development of evidence-based recommendations for future projects (Table 27).

An example of the application of the PAF can be found in the paper "Successful Implementation of Sustainable Last Mile Logistics Innovations by Using the Planning Analysis Framework" (Beck et al., forthcoming).

Table 27: Planning Analysis Framework

Analysis Step	Purpose
Situation Analysis	Provide an overview of the baseline conditions and define the system boundaries in terms of content, space, and time.
Target Analysis	Define and evaluate the objectives guiding the project.
Measure Analysis	Document the planned interventions and implementation measures.
Impact Analysis	Assess implementation progress (impact of actions) and evaluate environmental, economic, and social impacts (impact of measures).
Determinant Analysis	Analyse organisational structures, stakeholder interactions, and decision-making processes to identify barriers, success factors, and implementation conditions.

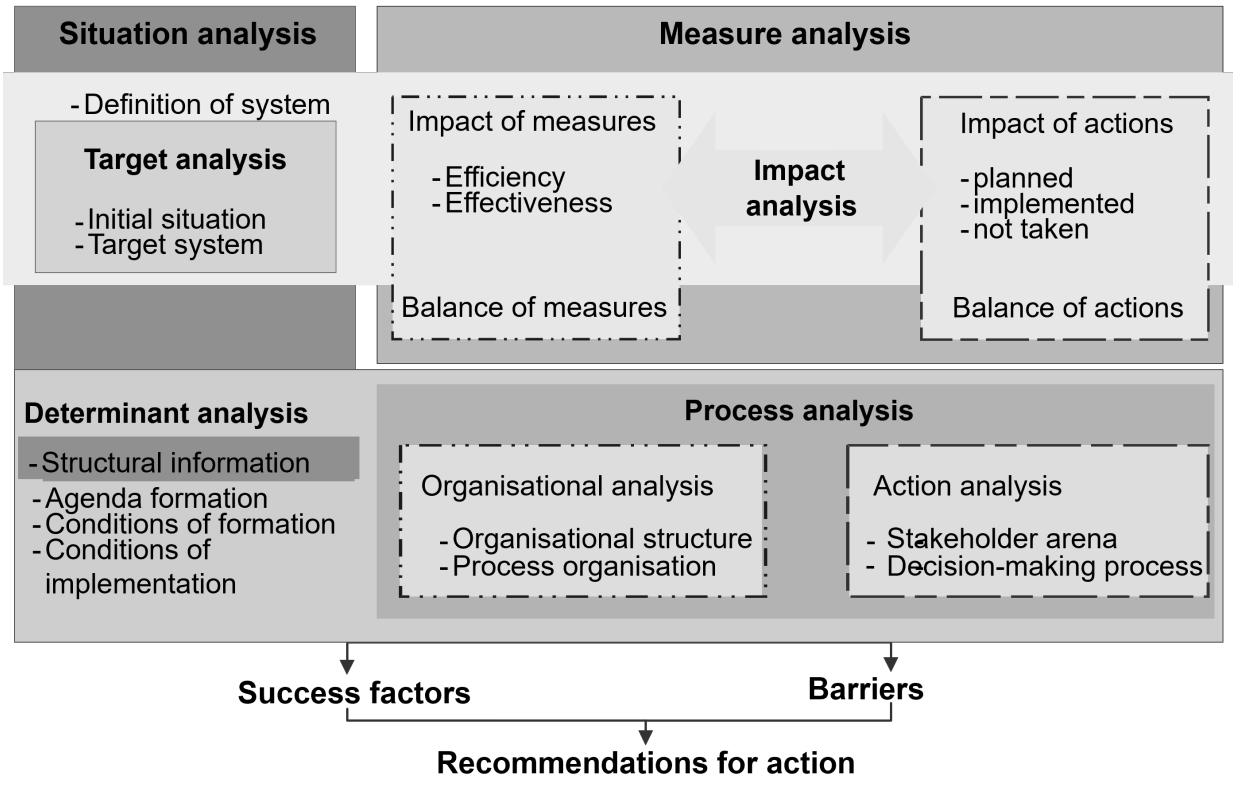


Figure 21: Planning Analysis Framework by Flämig (2004)

*Flämig, H. (2004). Wirtschaftsverkehrssysteme in Verdichtungsräumen: Empirische Analysen, Umsetzungsprozesse, Handlungsempfehlungen (Doctoral dissertation, European Centre for Transportation and Logistics; Technische Universität Hamburg-Harburg).



Figure 22: Testing of the TricyLift solution in Nantes

COMMUNICATION & DISSEMINATION

Why is it important?

Effective communication supports the successful implementation and long-term uptake of sustainable LML solutions. It helps build awareness, engage stakeholders, communicate project progress, and increase the visibility of the results achieved. Well-planned communication also promotes trust, facilitates collaboration, and encourages the replication of successful approaches beyond the project.

Objectives

- ✓ Raise awareness of the project
- ✓ Communicate progress and results
- ✓ Inform and engage stakeholders and local communities
- ✓ Support knowledge exchange and exploitation
- ✓ Promote the long-term uptake of successful solutions and replication

Expected Outcomes

- ✓ A communication and dissemination plan
- ✓ Clearly defined target audiences and key messages
- ✓ A project website and social media channels
- ✓ Communication materials adapted to different stakeholder groups, cultures, and events

What should be communicated?

Communication activities should evolve throughout the project. While messages will differ depending on the audience and project phase, they should consistently explain: what the proposed solution is; why it is needed; who benefits from it; what progress has been achieved; and what lessons and results can be transferred to others. Table 28 provides insight into possible communication topics throughout the project phases.

Table 28: Communication Focus across Project Stages

Project Stage	Communication Focus & Examples
Project Launch	Introduce the project vision, objectives, expected impacts, consortium, participating cities, and the challenges the project aims to address.
Stakeholder Engagement	Share methods and results from workshops, co-creation activities, interviews, Living Lab events, and explain how stakeholder feedback influences the development of the use case.
Solution Development	Present the selected logistics solution, technologies, business model, and governance approach. Discuss and explain why these solutions were chosen to address local challenges.
Pilot Preparation & Implementation	Showcase infrastructure installation, equipment deployment, training activities, pilot launches, demonstrations, operational milestones, and behind-the-scenes insights from the Living Labs.
Results & Lessons Learned	Communicate key achievements, measurable impacts, user experiences, challenges encountered, lessons learned, and recommendations for future implementation and replication.
Knowledge Sharing & Networking	Promote public deliverables, fact sheets, videos, webinars, conference presentations, workshops, collaborations with sister projects, and other knowledge-exchange activities.
Replication & Project Legacy	Share replication guidance, policy recommendations, practical tools, success stories, and how other cities and organisations can build on the project's results.

Planning Communication Activities

Communication should be planned from the beginning of the project rather than treated as a final dissemination activity. Developing a simple communication plan ensures that messages are delivered consistently and reach the intended audience at the appropriate time.

Table 29: Elements for Planning Communication Activities

Element	Key Questions
Goals	What do you want to achieve?
Audience	Who do you want to reach?
Key Messages	What information should be communicated?
Communication Channels	Which tools will you choose?
Timing	When should communication take place?
Responsibilities	Who is responsible for communication activities?

Channels and Materials

Different audiences require different communication channels. A combination of online and face-to-face activities helps maximise visibility and stakeholder engagement throughout the project.

Table 30: Communication Channels and Materials

Channel / Material	Communication Focus & Examples
Project Website	To serve as the central source of project information, results, deliverables, news, events and contact details throughout the project (Figure 32)
Social Media (LinkedIn, YouTube, Instagram)	To share regular updates, promote events, highlight milestones, showcase demonstrations, and reach a broad audience with short, engaging content (Figures 24 and 25).
Newsletters	To provide periodic updates, announce important milestones, events, publications, or project results to interested stakeholders.
Press Releases	To announce major achievements, pilot launches, project milestones, awards, or results to a wider public audience.
Fact Sheets & Brochures	To communicate key messages and project outcomes in a concise, easy-to-read format for stakeholders and decision-makers (Figures 26-31).
Videos	To explain concepts, showcase demonstrations of solutions or tools, introduce stakeholders, or communicate project impacts in an engaging way (Figure 24).
Infographics	To simplify complex information, illustrate processes, present key figures, or communicate impacts visually (Figure 31).
Demonstration Events & Site Visits	To showcase the implemented solution in practice and allow stakeholders to experience the use case firsthand.
Webinars	To present project results, share and exchange lessons learned, and engage audiences who cannot attend in person.
Conferences & Networking Events	To disseminate results, exchange knowledge, and connect with researchers, practitioners, policymakers, and other projects (Figures 23, 33-35).
Scientific Publications	To communicate research findings and methodologies to the scientific community.
Policy Briefs & Recommendations	To translate project findings into practical recommendations for policymakers and public authorities.
Replication Guides & Toolkits	To support other cities and organisations in adopting and adapting the project's solutions after the project ends.



Figure 23: Conference Stand with Project Panels

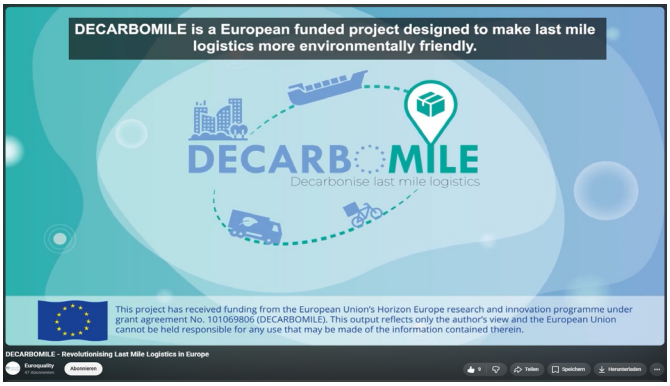


Figure 24: Video introducing the project

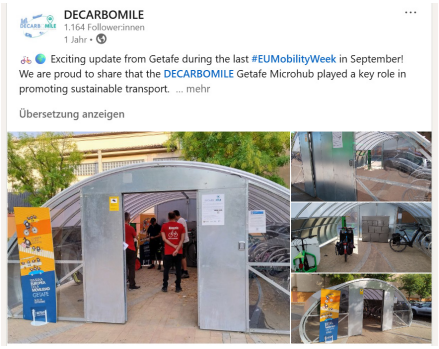


Figure 25: LinkedIn Post



Figure 26: Project Solutions Flyer



Figure 27: Project Poster



Figure 28: Project Goals Flyer



Figure 29: Sticker



Figure 30: Informational Sheet - Logroño Living Lab



Figure 31: Istanbul Living Lab Flyer

All articles

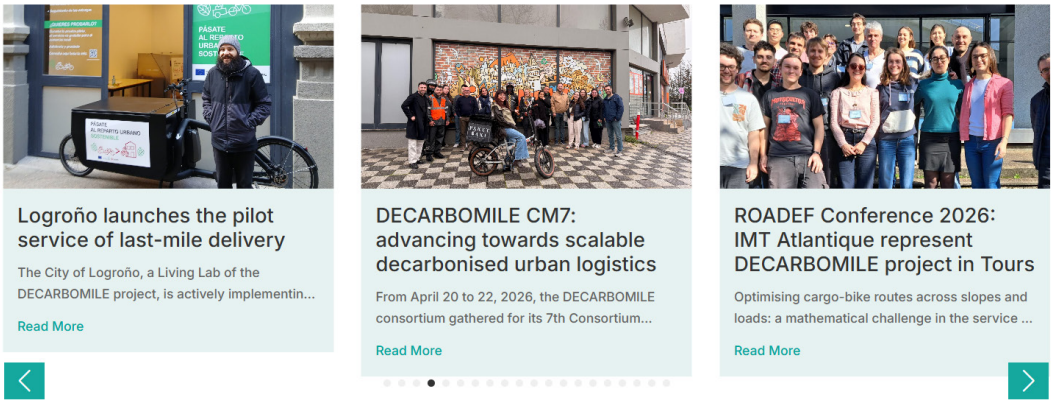


Figure 32: Example Blog posts on the Project Website

Publications

Beck, K., Flämig, H., Wolff, J., Fermazin, F., Hauswald, I., Giannakopoulou, A., & Froes, I. (forthcoming). Successful implementation of sustainable last mile logistics innovations by using the Planning Analysis Framework. Proceedings of the Transport Research Arena (TRA) 2026.

Beck, K., Esquillor, J., Zarei, M. M., Froes, I., Hauswald, I., Giannakopoulou, A., & Flämig, H. (2025). Making last mile logistics models aware of customer choices, demand sustainability and data economy. European Transport Research Review, 17(1), 29.

Beck, K., & Esquillor, J. (2023). Enabling the PI to solve multi-layered problems of the Last Mile Logistics. https://hdl.handle.net/11420/44849

Güneş, N., & Yılmaz, M. (2024, May). Traveling Salesman Problem as a Markov Process and Distribution of Solutions: Case Study. In 2024 32nd Signal Processing and Communications Applications Conference (SIU) (pp. 1-4). IEEE. DOI:10.1109/SIU61531.2024.10600937

Hauswald, I., Giannakopoulou, A., Beck, K., Wolff, J., Flämig, H., Fermazin, F., & Froes, I. (forthcoming). Barriers and facilitators of multistakeholder collaboration in urban living labs: A case study of DECARBOMILE. Proceedings of the Transport Research Arena (TRA) 2026.





Figure 33: Project Representation at the Urban Mobility Days 2025
(Helena Aguiar, Carmen Estévez, Christiane Kuhrt, Jutta Wolff, Pauline Buosi, Isabel Froes, Clarissa Reali)





Figure 34: Project and Poster Presentation at the TRA 2026
(Pauline Buosi, Fabian Fermazin, Jutta Wolff, Katharina Beck, Isabella Hauswald)







Figure 35: Urban Logistics Innovation Day in Brussels 2026
(Katharina Beck, Laura Alquezar Rodriguez, Sophronius Schalies)

GENDER EQUALITY & INCLUSION

Why is it important?

Sustainable LML should benefit all users and provide fair, safe, and accessible working environments for all. Considering gender equality and inclusion throughout the project helps ensure that new logistics solutions are designed for diverse users, helps reduce participation barriers, and supports equal opportunities in planning, implementation, and operation.

Objectives

- ✓ Raise awareness and reflect on inclusion and equality

Expected Outcomes

- ✓ Understanding of inclusion in LML
- ✓ Equality & Inclusion Plan

What is it about?

Ensuring inclusion and gender equality within LML means creating processes, services, and working environments that are accessible, inclusive, and representative of diverse user groups. This includes both participation in decision-making and equal access to the opportunities created (Figure 36). The transition towards decarbonised urban mobility and logistics can impact different groups in different ways. New delivery models, working conditions, and transport solutions, such as cargo-bike logistics, should therefore be designed and implemented with inclusivity in mind. The objective is not only to avoid exclusion but also to actively create environments that are inclusive, attractive, and accessible to all genders and groups throughout the project lifecycle.

How to approach it

Step 1: Assessment & Awareness

A first step is understanding the local social and cultural context within each Living Lab. This includes identifying potential barriers to participation, existing imbalances, or local practices that may influence accessibility and inclusion within logistics operations and stakeholder engagement activities. At the same time, raising awareness of gender and inclusion topics within the project team helps ensure that these aspects are actively considered throughout the project and not treated as an isolated requirement.

Step 2: Define Objectives

Based on the initial assessment, projects should define concrete objectives and commitments related to equality and inclusion. Possible objectives may include:

- ensuring balanced participation in workshops and decision-making;
- supporting equal access to new logistics services and solutions;
- creating inclusive and attractive working environments;
- increasing awareness of diversity and inclusion within project activities.

Step 3: Implement & Measure

Gender equality and inclusion should be supported through practical measures integrated into daily project activities and governance processes. This may include inclusive communication practices, balanced representation in stakeholder activities, and clear procedures for prevention and handling discrimination or harassment. Regular monitoring and evaluation help assess whether the implemented measures are effective and whether additional actions are needed throughout the project lifecycle.



Figure 36: DECARBOMILE Workshop in Logroño


Clean &
Last m
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App for
drivers

Green
mile
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DECARBOMILE

Decarbonise last mile logistics

DECARBOMILE.EU