

Agile Model Implementation Roadmap for Step 1 Demonstrations

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Executive summary

This report presents the DISCO Agile Model Implementation Roadmap, a crucial deliverable for Task 4.1, designed to guide the Starring Living Labs demonstrations in Step 1 of the project. The Agile Roadmap serves as a vital tool for verifying the implementation progress in different phases of the project, with a specific focus on the two cycles of WP4: Cycle 1 (M4-M8) and Cycle 2 (M16-M22). By adhering to the Agile methodology and the Iterative approach, the Roadmap provides a structured and efficient approach to monitor activities and ensure successful demonstrations.

The integration of the PI-led Meta Model Suite (WP2) and the UF Data Space (WP3) into the Roadmap's activities enhances knowledge exchange with the Living Labs (LLs) and fosters innovative solutions. The report explores the tools identified by Task 4.1 to effectively support the LL leaders in translating the Roadmap into practical solutions, including the use of a visual collaboration platform, one-to-one meetings, and a comprehensive plan for collaboration and communication.

A preliminary version of the factsheet for the four Starring LLs is presented in Annex 1, providing essential information about the LLs' progress and achievements. The factsheet, to be completed in M12, helps LL leaders align their efforts and make informed decisions during the demonstration management process.

Overall, the report highlights the importance of the Roadmap and its integrated approach, offering a clear overview into the tools and measures used to support the LL leaders. With this structured approach, Task 4.1 aims to achieve successful demonstrations and pave the way for data-driven sustainable urban logistics solutions.

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Glossary of Terms and Acronyms

Table 1 - GLOSSARY OF ACRONYMS AND TERMS

Acronym / Term	Description
ICBT	Impact Creation Board for Transformation
LL	Living Lab
SULP	Sustainable Urban Logistics Plan
UAC	Urban Access Control
UF	Urban Freight
WP	Working package

1. Introduction

This report presents the **DISCO Agile Model Implementation Roadmap** designed for the demonstrations in Step 1, as deliverable for the Task 4.1: Stage 1 - Demonstrations concept and plans for implementation and evaluation [M1-M24]. The Roadmap is applied to the four DISCO Starring Living Labs (LLs):

- Helsinki (FI) – Task 4.2
- Ghent (BE) – Task 4.3
- Thessaloniki (EL) – Task 4.4
- Copenhagen (DK) – Task 4.5

During the initial months of the DISCO project (months 1-4), the partners of Task 4.1 developed the Roadmap, a crucial tool to verify the implementation progress throughout different phases of the project. The Roadmap plays a key role in monitoring the activities during the two cycles of WP4:

- **Cycle 1 (months 4-8)** focuses on introducing the main tools and activities, while identifying and addressing any gaps that require attention.
- **Cycle 2 (months 16-22)** aims to organize the feedback gathered from the first cycle and various sprints, which will be utilized to enhance the overall project implementation.

The Roadmap is a living document that will be updated throughout the project to reflect the changing needs and priorities of the project partners. It is an essential tool for ensuring that the implementation at the LLs is effective and efficient.

The Roadmap designed in Task 4.1 will continue to be valuable also for the activities in WP5. During the 4-month phase of Twinning LLs (M20-M24), it will be used as guidelines to finalize the preliminary activities and preparing the demo Plan for Step 2. Additionally, the Early Adopters part of Step 3 will benefit from the tools proposed by Task 4.1. The Roadmap's structured approach and valuable insights will play a pivotal role in ensuring the smooth progression of the project across different stages, fostering successful demonstrations, and facilitating the adoption of innovative solutions by stakeholders in subsequent phases.

The report emphasizes the initial steps taken to seamlessly integrate the PI-led Meta Model Suite and the UF Data Space into the Roadmap's activities. This integration plays a fundamental role in facilitating the exchange of advances and knowledge with the Living Labs (LLs). The Meta Model Suite is a set of tools and methodologies that allow for the integration of different data sources and the creation of a common understanding of the data. The UF Data Space will allow the sharing and exchange of data between different stakeholders.

The integration of these two tools into the Roadmap's activities will allow for the following:

- The exchange of advances and knowledge between the project partners and the LLs.
- The creation of a common understanding of the data that is being used in the project.
- The sharing and exchange of data between different stakeholders.

This integration is in line with the principles of the Agile methodology and the Iterative approach, which are described in Section 3 of the report. The Agile methodology is a way of working that emphasizes flexibility and adaptability. The Iterative approach is a way of working that breaks down a project into smaller, more manageable tasks. An overview of the integration of the Meta Model Suite and the UF Data Space into the Roadmap's activities is offered later in this report (in Subsection 3.3). Although still in its early stages, the initial steps that have been taken to integrate the data models have been promising. The report recommends

that you refer to the outcomes presented in WP2 and WP3 for a more comprehensive understanding of this integration.

In Section 4 of the report, the different tools identified by the Task 4.1 leader are explored, aiming to translate the Roadmap into practical and effective support for the LL leaders. These tools serve as essential resources to guide and assist the LL leaders throughout the implementation process, enabling them to effectively manage and progress through the various stages of the project. By leveraging these tools, the LL leaders can make informed decisions, monitor progress, and address any challenges or gaps that may arise, ensuring the successful delivery of the demonstrations. The report provides an in-depth analysis of the set of tools and measures available, for example the use of the visual collaboration platform, one-to-one meetings, the plan for collaboration and communication. The set of tools will be used and adapted in the four phases of development, demonstration, evaluation and scaling. Finally the conclusions are presented.

The Annex 1 of the report presents a preliminary version of the factsheets, which will be completed in M12 as an outcome of Work Package 4. The initial presentation of the state-of-the-art for the four Starring Living Labs (LLs) in M3 is not intended to provide a comprehensive picture of the LLs, but rather to familiarize the partners involved with the main elements to consider when managing the demonstrations. The factsheets will serve as a valuable resource, providing detailed information about the LLs' progress, achievements, and outcomes. This information will offer insights into the project's implementation journey. By familiarizing the partners with these main elements early on, the LL leaders can align their efforts, make informed decisions, and collaborate effectively to ensure the successful execution of the demonstrations.

Overall, the Agile Model Implementation Roadmap offers a structured approach for the LLs to effectively manage and progress through the different stages of the project, including development, demonstration, evaluation and scaling up of technical activities. This method aims at ensuring successful delivery of the demonstrations and it will be adopted for the Twinning LLs in Task 5.1: Demonstration, evaluation and replication plans [M20-M24], modified according to the lessons learned from WP4.

This deliverable marks the initial step in WP4, and it will be followed by two more deliverables:

- D4.2 – Starring LL measures implementation - focus on the implementation of measures in the Starring Living Labs, providing insights into how the proposed measures are being put into action (Month 24);
- D4.3 – Evaluation of impacts at Starring LLs - focus on evaluating the impacts of the implemented measures at the Starring Living Labs, offering an assessment of the outcomes and effects of the demonstrations (Month 28).

2. Objectives

The primary goal of Task 4.1: *Stage 1 - Demonstrations concept and plans for implementation and evaluation* [M1-M24] is to guide the four LLs cities in successfully delivering the demonstrations.

This first WP4 deliverable contributes to the main DISCO concept on the idea that city authorities and transport/logistics operators must identify the Urban Freight (UF) data to be collected and shared and explore the most suitable measures to integrate urban logistics into sustainable urban mobility planning. The starring LLs represent the optimal opportunity to implement and test the demonstrations for the digital, physical and business-related innovative measures by properly serving Functional Urban Areas – FUAs.

The specific objectives of WP4's Step 1 Roadmap are as follows:

1. Define a roadmap for the implementation of measures.

2. Identify how the PI-led Meta Model Suite and the UF Data Space will support the implementation of these measures at the Starring LLS in Helsinki, Ghent, Thessaloniki, and Copenhagen, during Step 1.

In summary, WP4's main objective is to guide the LLS in delivering effective demonstrations, while collaborating with WP2 *The DISCO urban logistics and planning PI-led Digital Transition* and WP3 *The Urban Freight Data Space for NetZero cities* for data collection. The roadmap aims to outline the plan for implementing measures and how the PI-led Meta Model Suite and the UF Data Space will assist in their execution at the Starring LLS in the four cities. This coordinated effort ensures a well-structured and supported approach to achieving sustainable urban mobility and NetZero objectives in the participating cities.

3. Methodology

This section provides an introduction to the three main elements that constitute the methodology for the roadmap activities:

1. Agile methodology
2. Iterative approach
3. Meta Model Suite and Urban Freight (UF) Data Space

These three elements, combined together in Task 4.1, offer a collaborative framework that enhances project management and increases the likelihood of successful demonstrations. This framework will be essential for the success of the DISCO project. By using these three elements, the project partners will be able to work together effectively, manage the project in a flexible and adaptable way, and continuously improve the project as it progresses.

This approach finds resonance in the broader context of city logistics planning, which usually encompasses four pivotal stages: I) establishing goals and objectives; II) making predictions and designs, III) implementing the plan/design, and IV) evaluating the outcomes.

3.1 Agile Methodology

The DISCO project will use an agile development methodology to build and showcase multi-agent Living Labs. This methodology is flexible and iterative, meaning that it allows for changes and improvements to be made throughout the development process. This is important because it ensures that the Living Labs meet the needs of all stakeholders and that they can adapt to changing requirements. The agile development methodology involves multiple stakeholders working together to achieve a common goal. This means that everyone involved in the development process has a say in how the Living Labs are designed and implemented. This ensures that the Living Labs are developed with the needs of all stakeholders in mind. The following gives a general description of the agile development methodology for multi-agent Living Labs and the following sections will provide the specific and detailed DISCO application of the methodology:

- **Alignment with project Vision and Scope:** The multi-agent Living Labs should be clearly aligned with the clear vision of the project and its scope, to understand the overall goals, stakeholders, and expected outcomes. This includes also identifying the primary use cases and functionalities of the innovations that will be demonstrated in the Living Labs.
- **User Stories and Requirements:** The Living Labs' scope will be broken down into manageable user stories or functional requirements. Each user story represents a specific piece of functionality from an end-user's perspective, and it is of great importance to prioritize these stories based on their importance and potential impact.

- **Iteration Planning:** The Living Labs' development plans will be broken down into short, time-boxed iterations. The local Living Lab partners will collaborate with the project team to decide which user stories to include in each iteration based on priority and complexity. It is important to aim for a balance between adding new features and addressing technical insufficiencies.
- **Continuous communications:** Effective communication and collaboration among project and Living Lab partners are crucial for the success of an agile Living Lab management. Open discussions, feedback loops, and constant communication between project and Living Lab partners, stakeholders, and end-users should be encouraged. Therefore, regular Living Lab meetings will be established where the innovation development partners and the Living Lab stakeholders discuss progress, challenges, and plans for the upcoming period. This helps to foster communication, identify blockers, and ensure everyone is aligned.
- **Design and Architecture:** During the initial iterations, a focus will be laid on designing the overall architecture of the multi-agent system, which includes identifying the different Living Lab stakeholders and their interactions, communication protocols, and data flow.
- **Development and Testing:** The innovations will be developed incrementally in each iteration, and they will be initially tested in a controlled environment to ensure the reliability and effective functionality of the innovations. The testing will be followed by an "Iteration Review and Retrospective" (see further information below).
- **Demonstration and Feedback:** At the end of each iteration, the functionalities of the innovations, implemented during that iteration, will be showcased and feedback will be gathered from the Living Lab stakeholders, including end-users, to ensure the innovations aligns with expectations and requirements.
- **Iteration Review and Retrospective:** After the demonstrations, an iteration review will be carried out to evaluate the accomplishments and identify areas for improvement, including a retrospective discussion on what went well, what could be better, and if any necessary adjustments would be needed.
- **Adaptation and Evolution:** Agile methodologies embrace change, so DISCO is prepared to adapt to new requirements or insights discovered during the development process. The changes in end-user needs will be prioritized and the necessary adjustments to the development plan will be made accordingly.

3.2 Iterative Approach

Highlights the iterative nature of the roadmap, emphasizing the need for continuous feedback, evaluation, and adaptation throughout the implementation process. The agile methodology is a flexible and adaptive approach that involves multiple levels of feedback and improvement for the ecosystem actors. In this context, the timeline of the iterative approach can be split into four main periods, 1st period (months M0-M4), 2nd period (months M4-M8), 3rd period (months M8-M16), and 4th period (months M16-M22). The second and the fourth periods are identical to the (Agile) cycle 1 and (Agile) cycle 2 respectively that constitute the whole agile lifecycle. The following figure depicts all the different actions that will take place during the agile lifecycle incorporating all the necessary stages of the Agile methodology that will be used explaining briefly what is going to be done and in the context of which work package.

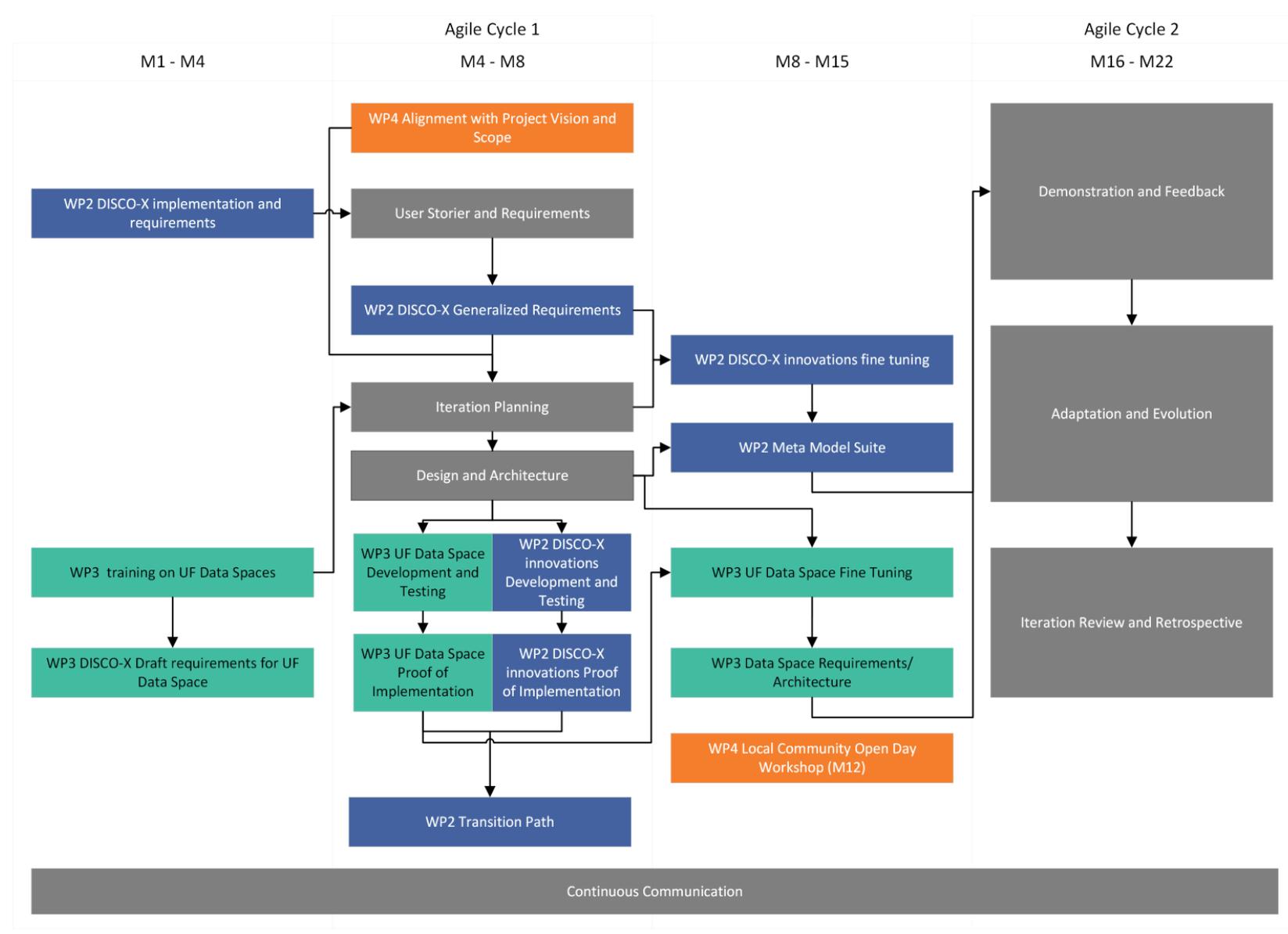


Figure 1. DISCO Agile Methodology flowchart

In more depth, during the 1st period which can be determined as the preparation stage, three main actions will take place in order to draft define requirements for the measures and the dataspace. Initially, the DISCO-X implementation and requirements will be drafted by the DISCO-X responsible partners based on their experience (WP2), then cities will attend online training sessions regarding the UF dataspace entitled “5 Steps to build Data spaces” (WP3) and draft UF dataspace requirements will be defined using the draft DISCO-X implementation and requirements of WP2 (WP3).

The second period which corresponds to the 1st cycle of the agile lifecycle will contain 8 actions in order to achieve generalised DISCO-X requirements and a proof of concept for the DISCO-X measures. First of all, living labs will align their proposed implementations with the project vision and scope (WP4) after bilateral meetings with DISCO partners and cities LLs. At a next step, using this knowledge together with the WP2 draft DISCO-X implementation and requirements, cities should modify their user stories and requirements based on what is possible to be done and what can actually be done (based on their capacity building). At this step, DISCO partners will use the updated cities stories and requirements and the draft DISCO-X implementation and requirements to produce the DISCO-X generalised requirements (WP2). Afterwards, the iteration planning will take place combining the generalised DISCO-X requirements, the updated user stories and the knowledge from data space training, each living lab will be broken into stages and the most suitable solution will be selected. The selected use case of each living lab will be used as input for the Design and Architecture to define the overall architecture of the multi-agent system. By the end of the 2nd period, based on resulted architecture, the Development and Testing of the UF Data Space (WP3) and DISCO-X innovations (WP2) will take place which will give feedback to the implementation of the UF Data Space (WP3) and DISCO-X innovations (WP2). Finally, the different outcomes of the 1st cycle (e.g., generalised DISCO-X requirements, UF dataspace requirements and architecture, etc.) will be used to generalise the transition path of each living lab (WP2).

Then, there is the 3rd period which consists of 8 months (M8-M16) between the 1st and the 2nd cycle which will achieve a fine tuning of the DISCO-X innovations and the Data spaces and the building of the Meta Model Suite. At first, the DISCO-X generalised requirements together with the results of the iteration planning, where LLs selected their most suitable solution, DISCO-X responsible partners updated the very initial draft DISCO-X implementation description and then, this knowledge was combined with the design and architecture of the previous cycle to develop the Meta Model Suite (WP2). Together with that, the UF Data Space will be fine-tuned based on the UF Data Space Proof of concept implementation outcome.

Finally, the 2nd cycle which takes place between the months M16 and M22 corresponds to the whole demonstration of the pilot and will finalise the outcomes based on the lessons learnt from the implementation. During M16, the Meta Model Suite and the UF data space will be available for the LLs to consume. As soon as they start doing the demonstration, the different lessons learnt from this phase will feed the Demonstration Feedback and during the Adaptation and Evolution process the DISCO-X innovations and the Meta Model Suite will be updated.

3.3 Meta Model Suite and UF Data Space

The LLs will use a Meta Model Suite and the Data Space for their digital transition, when implementing their package of DISCO-X digital, physical and business measures influencing 5 Impact Domains.

Meta Model Suite is a tool that helps cities to adopt and implement innovative logistics solutions in order to foster innovation and cooperation among different stakeholders in urban mobility. It provides a comprehensive framework that covers the different aspects of urban mobility, such as planning, governance, stakeholder engagement, financing, monitoring and evaluation. Meta Model Suite also offers a set of practical

tools and resources that cities can use to assess their current situation, select the most suitable solution, check the requirements and develop a data space.

As shown in Figure 2, Meta Model Suite consists of five stages that guide cities through the process of implementing innovative mobility solutions.

0. The zero stage is **Knowledge Hub**, which provides a list of tools, best practices, experiences and more that can help cities to learn about the different aspects of urban mobility and innovation.
1. The first stage is **Transition Guidance**, which helps cities to define their vision and goals for urban mobility and to select the most suitable solution from a list of different scenarios.
2. The second stage is **DISCO-X Innovations**, which helps cities to choose the best DISCO-X innovation(s) for their favorable scenario.
3. The third stage is **DISCO-X Required Tools**, which helps cities to check if they have the necessary resources and capabilities to implement the chosen DISCO-X solutions.
4. The fourth and final stage is **The Urban Freight Data Space**, which helps cities to develop a data space for their city in order to implement and monitor the DISCO-X solutions.

All together, these tools can be valuable assets for cities that are looking to achieve their digital transition and to foster innovation and cooperation in urban freight transport.

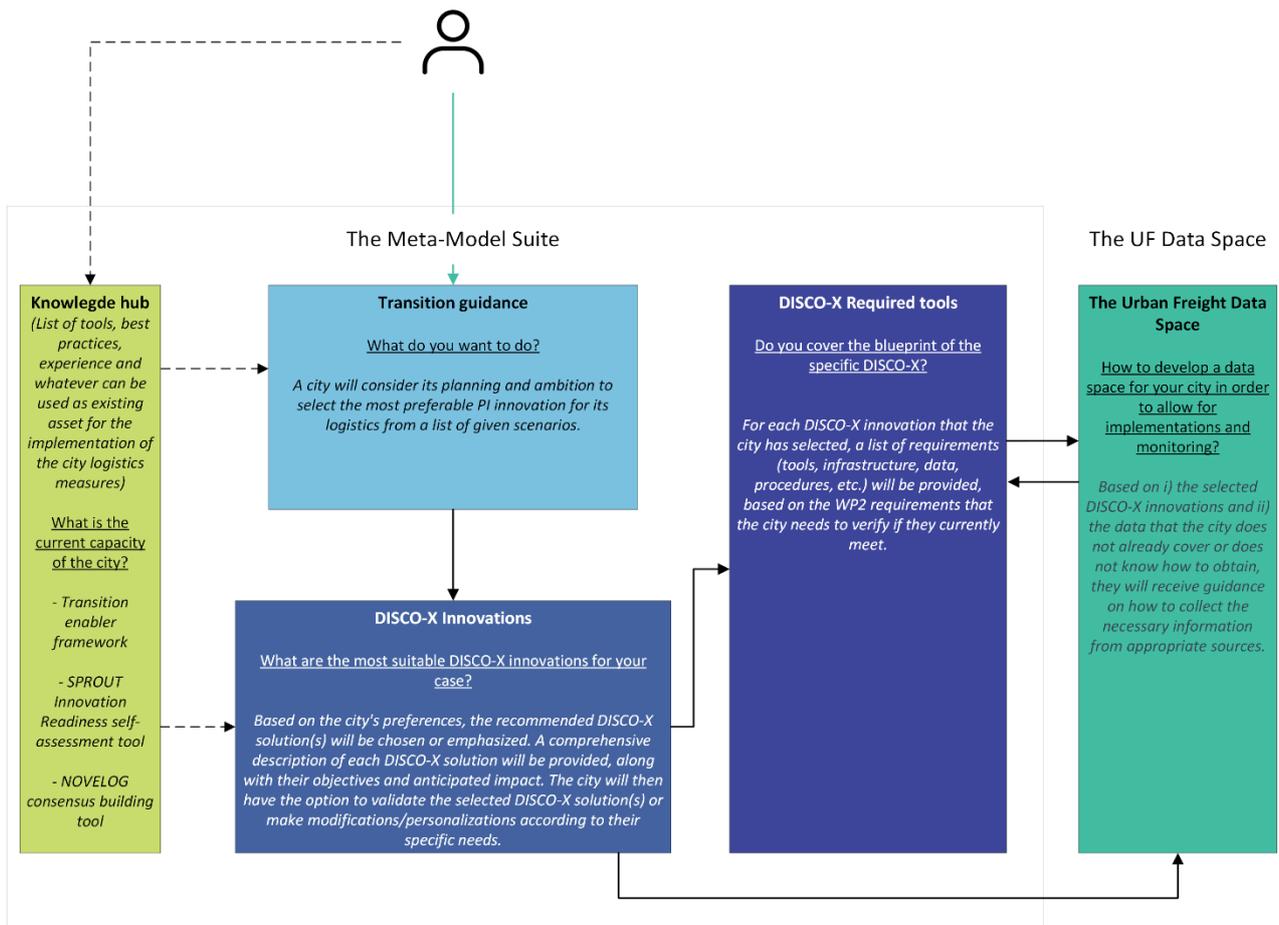


Figure 2. Meta model suite five stages

3.4 Risk Management

Risk management is a dedicated section and deliverable in DISCO. The author does not intend to repeat information that is already included in other deliverables. A clear and comprehensive description of the DISCO risk management are available in Deliverable D1.1, in particular the most critical measures for each starring Living Lab are described in Section 2.2.3.1. One key aspect pertains to the management of sensitive LL data and the associated risks of its potential external disclosure and sharing. The approach here involves proactively informing stakeholders about the principles of data sharing, assuring them that the data shared will be anonymized, thereby safeguarding sensitive information. The WP4 Leader is supporting each starring living lab in evaluating and monitoring the various risks, in cooperation with the Rupprecht Consulting (responsible for the risk management in DISCO), who created a tool for the risk monitoring (see D1.1 at [2.3.2.1 DISCO Risk Monitoring Tool](#)) to be used by each Living lab all along the demonstration.

Furthermore, the alignment of requirements for implementing and deploying solutions may present challenges that could potentially lead to delays. To mitigate this, the Agile Implementation Model adopted for Task 4.1 established facilitates the alignment to the demo requirements. To ensure effective progress tracking, supplementary technical meetings will be coordinated to oversee the advancement of the implementation efforts. This approach aims to foster smooth implementation, manage potential delays, and ensure that the demonstrations remain on track in accordance with project objectives.

4. Introducing the Agile Implementation Roadmap

This Section presents the Agile Implementation Roadmap that has the scope of guiding LLs on the measure's and tool's lifecycle implementation to verify, check and support Stage 1 in development, demonstration, evaluation or scaling up of technical activities. In line with the Agile methodology and the Iterative approach, the kit of tools and measures that have been specifically designed to empower and assist the LL leaders include: drafting and updating the Factsheet; sharing main steps on collaborative visual platform; arranging one-to-one meetings; attending workshops, project meetings and Open days; fostering collaboration and communication; and identifying the lessons learned.

Taking into consideration the concepts of the Agile methodology as outlined in Section 3.1 and the flow diagram described in 3.2, the Task 4.1 leader undertook an assessment during the initial four months of DISCO. This assessment aimed to identify the most appropriate and effective actions that align with the characteristics and requirements of each partner category participating in the city logistics Living Labs. These partner categories encompass municipal and public governmental bodies, software companies, transport and logistics operators, as well as retailers and third-sector organizations, depending on the specific context. Consequently, it is essential for the Roadmap's design to accommodate the diversity of partner types and the varying sizes of consortia that will be established at the local level.

The tools identified by the roadmap are intended to guide LL leaders through the challenges of initiating demonstration projects. For instance, the Task 4.1 leader has started assisting each city in defining clear goals and objectives, while also emphasizing the distinction between the two. In this context, objectives are characterized by measurability, directly linked to specific outcomes (like 'reduce air pollution by xx' or 'increase the utilization of alternative-fueled vehicles by xx'). On the other hand, goals adopt a broader,

qualitative perspective, often without predetermined results but encompassing overarching aims (such as 'enhance sustainable delivery practices' or 'facilitate the consolidation of delivery operations'). This comparison between goals and objectives highlights how the organized approach of the collaborative framework aligns with the iterative nature that is fundamental to city logistics planning. In the case of DISCO, the objectives, especially, need to incorporate the data management component and align with the Data Model Suite. This information will be available in the final version of the Factsheets.

Figure 3 provides a visual depiction of the Roadmap's structure. In the upper left corner, the diagram highlights the nine fundamental components of the Agile Methodology, encompassing elements like Iteration planning. Moving to the lower left, there is the set of tools designated to offer tangible assistance to LL leaders for the effective administration of each demonstration. Lastly, on the right-hand side, the graphic showcases the four phases—development, demonstration, evaluation, and scaling—wherein the Roadmap's application and adaptation will unfold.

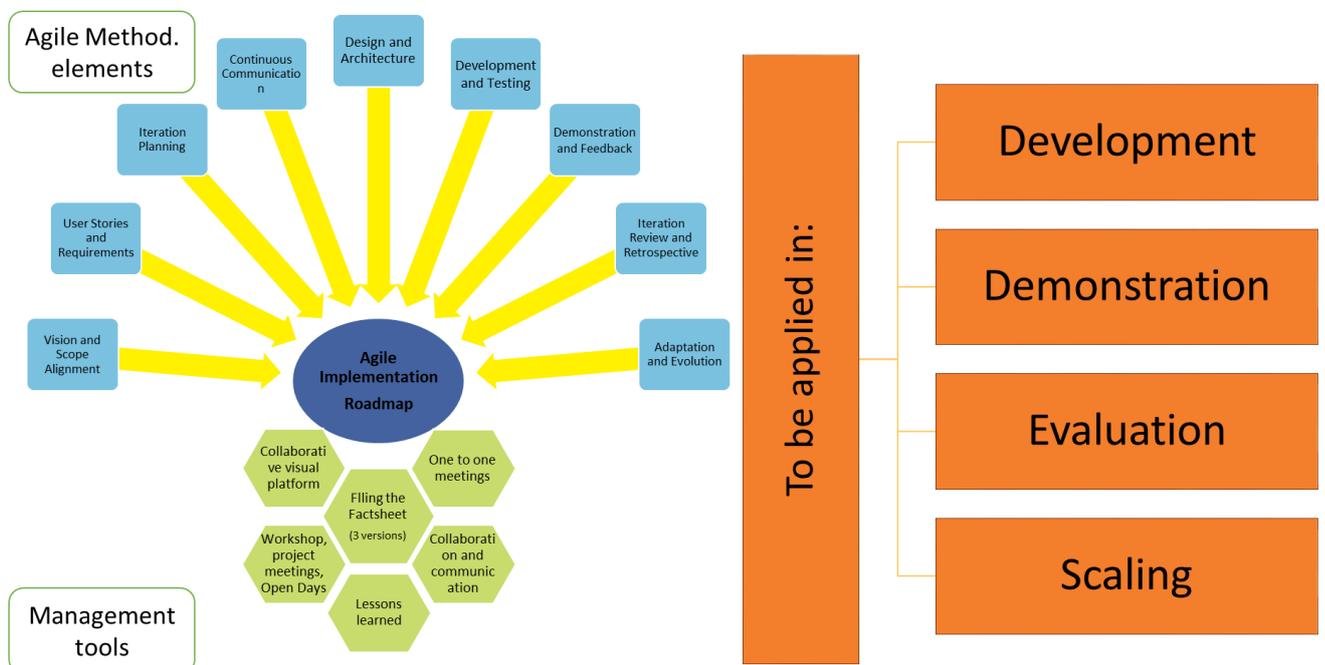


Figure 3. Agile Implementation roadmap

This section provides clarification on how each element of the Agile Methodology is applied through the use of the selected tools:

- **Vision and Scope Alignment:** Share core elements, goals and objectives of the Living Labs with all stakeholders. Ensure a clear understanding of the project's overarching vision and scope.
- **User Stories and Requirements:** Break down the Living Labs' scope into user stories or functional requirements. Collaboratively define these stories with stakeholders to prioritize their importance.
- **Iteration Planning:** Utilize collaborative visual platform tools to plan iterations. Decide on user stories for each cycle through collaboration between Living Lab partners and project teams.
- **Continuous Communication:** Foster open communication through various means, including one-to-one meetings, project meetings, and quick replies to emails. Maintain regular dialogues to ensure alignment.
- **Design and Architecture:** Use collaborative visual tools to design the architecture of Living Labs. Define stakeholder interactions and data flow through iterative collaboration.

- *Development and Testing*: Incrementally develop innovations based on user stories. Utilize workshops and project meetings to provide updates and gather feedback.
- *Demonstration and Feedback*: Showcase implemented functionalities of innovations in Open days. Collect feedback from stakeholders, gathering input from stakeholders to validate alignment with their expectations.
- *Iteration Review and Retrospective*: Carry out periodic reviews during project meetings, reflecting on accomplishments and pinpointing areas for enhancement.
- *Adaptation and Evolution*: Embrace adaptability in project plans based on feedback. Utilize collaboration and communication channels to implement changes driven by end-user needs.

By implementing Agile methodology, DISCO combines these actions to ensure seamless collaboration, effective communication, and iterative progress within the Living Labs' initiatives for city logistics.

4.1 Structure of the Factsheets

The goal of the selected strategy is to ensure that the LL leaders have real-time access to essential project information, enabling them to make informed decisions, monitor progress, and adapt strategies as needed to achieve the project's objectives successfully, in collaboration with the Task 4.1 leader.

Specific elements have been selected to document the implementation process, to form a robust framework, empowering the LL leaders to effectively navigate and manage the project. These elements comprise:

1. Short overview of the LL
2. Qualitative goals and quantitative objectives for the demonstration activities,
3. Identification of the stakeholder community,
4. Strategies facts and figures
5. Necessary aspects to consider for the implementation of the measures
6. Status of subcontracting/equipment/tenders overview
7. Demo plans
8. Data collection plan

Three critical moments have been identified for closer monitoring of the implementation progress. At these moments the Task 4.1 leader has arranged/ will arrange one-to-one meetings to support the LL leaders in updating the Factsheet.

- 1) In Month 3, a first preliminary draft of the Factsheet has been carried out to track the state of the art of the project management and to set up the demonstration. This initial step aimed to create a communication with the LL leaders and to help them assess the readiness and preparedness of the Living Labs for the implementation process. This activity has been supported by the use of the collaborative platform and a one-to-one meeting.
- 2) During Cycle 1 (M4-M8), the tool presented in M3 will help fine tune the main activities to be developed in the measures, focusing on gaps to be filled. This phase will involve an update of the Factsheet and there will be the opportunity to discuss adjustments to ensure that the project stays on track and meets its objectives effectively.
- 3) Towards the end of Cycle 2 (M16- M22), the monitoring will intensify to demonstrate the progress made and finalize the factsheet, which will provide a comprehensive summary of the project's achievements and outcomes. This stage will validate the success of the Living Labs' efforts and define the key results to be shared with the Twinning LLs (WP5). Moreover the LL leaders will be encouraged to link with the leader of the corresponding DISCO-X (T2.3) to refine the scope for different measures.

4.2 Interaction and collaboration tools

In M3, the LL leaders were provided with a canvas in the collaborative visual platform, Miro (Miro.com), enabling them to familiarise with the core elements identified for the Factsheet for managing the project. This visual collaboration tool MIRO ensures effective communication, alignment, and adaptability throughout the implementation journey, granting LL leaders real-time access to crucial project information. Moreover the LL leaders and their teams can continuously update and track these elements over time. In Figure 4, the principal components outlined in Subsection 4.2 constitute the central area of the canvas. Here, each LL leader has the opportunity to present, in a succinct manner, the key attributes of the demonstration stage.



Figure 4. The canvas for Project management in MIRO

This dynamic tool suits the Agile approach as it fosters a collaborative and flexible environment, allowing informed decision-making, progress monitoring, and adaptive strategies to successfully achieve the project's objectives.

4.3 One-to-one meetings with LLs leaders

As part of the Agile methodology, in M3 one-to-one meetings were held between the leader of WP4 (ITL) and the leaders of LLs, following the approach of continuous communication. These meetings served multiple purposes, including identifying the current state of the art for in each city, defining the first practical steps for implementing the measures, and outlining the data plan. The visual collaboration platform MIRO has been used as a tool to foster the main elements to be discussed.

During these meetings, discussions were focused on understanding the ongoing actions to coordinate the start of the demonstration, including available data and existing partnerships. Additionally, practical steps for the implementation of the measures were deliberated upon. This involved breaking down the measures into actionable tasks and defining a short term plan with the necessary resources and timelines for their successful execution.

Special consideration has been dedicated to planning for the summer break to prevent any delays or gaps in the implementation steps, particularly concerning the engagement of additional partners within the local consortium.

Moreover, a first discussion about the data plan was conducted in these interactions, which introduced the topics of the specific data requirements for supporting the demonstrations. This encompassed the existing datasets and the data collection methods and sources.

The one-to-one meetings will continue during the entire WP4 implementation. By combining these efforts, the partners are able to establish a framework for the demonstrations. The one-to-one meetings facilitate effective collaboration, enabling the stakeholders to align their goals and objectives, and lay the groundwork for the successful implementation of the measures in the Living Labs. This approach within the Agile methodology ensures that the project progresses with well-defined objectives and data-driven decision-making processes throughout its lifecycle.

4.4 Workshops, project meetings and Open days

Apart from one-to-one meetings and digital tools, additional opportunities have been devised to facilitate project progress discussions and foster interaction among the LLs in particular during the project meetings, with dedicated session on the update of the demonstration. This activity is supported by four external experts from the Impact Creation Board for Transformation (ICBT), each providing contributions based on their respective expertise and the nature of the city logistics initiative to be implemented. Their contributions can be provided in written form or presented in person during the events, and they will be integrated into the various stages of the demonstration process.

Moreover at local level, within the local community of each LL will be supported by the WP4 leader on arranging a meeting - Open Day - with local stakeholders at strategic moment of the implementation. Open Days are specific local events held in the local language, where the Living Lab team can brainstorm, discuss, plan, and decide how to implement activities with a large number of stakeholders. They are organized in the city where the Living Lab is located (one for each Living Lab), and they last for one full day. The budget for organizing the Open Days is provided by ITL, but it is limited. Each Living Lab leader must be in contact with ITL to organize the Open Days. They must be organized within M12 in all Living Labs, with the possibility of also organizing them within project meetings if possible.

Workshops have been strategically planned to provide comprehensive information to partners and LL leaders regarding the establishment of the Data Share Space. In M3 for example, two Workshops have been organised in 2023 so far.

1. Workshop 1 held on June 27th with the title: 5 Steps to build Data Spaces¹, organized by the International Data Spaces Association (IDSA), responsible for Task 3.4: “The Data Space Radar and organizations' onboarding process”. The aim of this workshop was to share all the knowledge on data spaces with the consortium partners.

2. Workshop 2 on DISCO-x requirements specification², held on July 13th. The main objective was to improve understanding of how WP4 can contribute to WP2 in terms of the type of information and its format. This process is crucial for defining the transition data.

Both workshops were recorded and made available for the future.

Moving forward, these initiatives will play a crucial strategic role in clarifying the creation of the Meta suite Model and the UF Data Space in the coming months.

4.5 Collaboration and communication

To ensure a successful implementation of the project’s innovative demonstrations and the urban logistics digital transition within each Living Lab, targeted dissemination, exploitation and communication is required.

The specific objectives of the DISCO dissemination activities are to:

1. Promote broad visibility of the project’s work and disseminate its practices within the DISCO communities and beyond (e.g., DTLF, Mission Platform, CIVITAS);
2. Establish liaisons with connected initiatives and projects and organise webinars / events for increased and effective dissemination of information to target groups;
3. Facilitate the implementation of sustainable planning by the active involvement of the stakeholders value chain through capacity building and support alignment of challenges, acceptance, and adoption of innovative urban logistics solutions in DISCO Living Labs.

A comprehensive roadmap outlining specific activities will be defined in **the Dissemination and Communication Strategy (D7.1)**, which will be available by M6. The aim of the document will be to provide detailed guidelines to partners on how DISCO will achieve the above objectives.

This task will be a joint effort. Strong collaboration between WP7 and the other work packages, including the Living Labs, is essential to ensure effective communication also at a local level. After all, Living Labs know best their own local context: it is therefore important for each city to define what would work best for local dissemination, what kind of messages need to be conveyed that can be effectively translated in the respective local languages, how to engage the project target groups, and so forth. The DISCO Communications team (WP7) will be there to support this process, consolidating a succinct Local Communications Plan to inspire LLs for promoting the project at a local level as effectively as possible. Each Living Lab will then be invited to put into action, where possible, the guidelines mentioned in the document.

Local communication and engagement will occur on two levels:

Level 1 (main): within each Living Lab

- LLs to take action on the activities stated within the GA and Local Communications Plan, which will include:

¹ The recording of this workshop is available on <https://www.youtube.com/watch?v=Dqy2VCwU2P8>

² Material and recording are available for partners in the shared folder [20230713 - WP2 Workshop](#)

- Workshops and events;
- 8 local open days;
- Bootcamps with local stakeholders and citizens;
- Use of local digital tools and channels in respective LL language;
- WP7 to support LLs in carrying out the following tasks by:
 - Providing communications materials and guidelines for effective communication at local level;
 - Deliver consistent, cohesive, and articulate message for DISCO re: the specific Living Lab, based on indication provided in D7.1 and the Local Communications Plan;
 - Carrying out dissemination and communications activities at a European level;
 - Provide ad-hoc communications assistance when needed.

Level 2 (secondary): Between all Living Labs

- Explore common synergies;
 - E.g. geographical proximity: can have similarities in local context
- Identify best practices and how they might be replicated in each DISCO city and beyond;
- Define common challenges and how to overcome them, leading to potential revisions and improvements of the Local Communication Plans;
- Review lessons learned and what to improve moving forward;
- Online Exchanges and interactions with the POLIS WG on Urban Freight and other EU-funded projects focusing on urban freight issues.

4.6 Lessons learned

For the DISCO project, the Twinning Labs (WP5) and Follower Cities are required to learn from the Starring Labs (WP 4) in order to increase the technology readiness level. This requires continuous learning from both work packages, however, due to the impracticality of geographical location as well as project milestone timing, some of the earlier lessons may be long forgotten before the transition period between WP4 to WP5. This requires a strategy for documenting the lessons learnt during the WP4 duration and communicating them timeously to ensure that the different living labs do not repeat the same mistakes and can learn from the tasks that were executed well. In doing so, a best practices approach can be formulated and corroborated per DISCO-X innovation.

Lessons Learned within WP4 will thus be captured through a 6 step process adapted from the PMBOK Guide 5 step process (2004, p.367), as described in Figure 5.

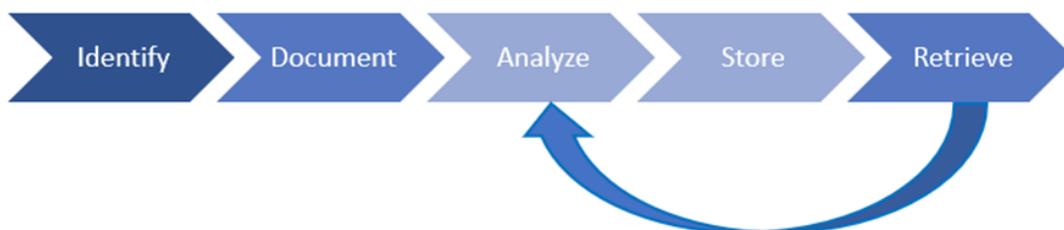


Figure 5. Lessons Learned Process

4.6.1 Identify

Include a lessons learned session in WP meetings once a quarter or more often if required (according to project milestones). Invite key stakeholders, project team members, living labs and relevant WP leaders to participate in the session. Open and honest discussions should be encouraged to identify both positive and negative experiences, challenges faced, and areas for improvement.

4.6.2 Document

Assign a dedicated person (living lab leader or administrator) to be responsible for documenting the lessons learned. This will be done by use of a standardized template ([Lessons Learned Form](#)) to capture the lessons learned information consistently. During the session, capture the identified lessons with details such as the project phase, context, issue or opportunity, and the lesson itself including supporting evidence, such as pictures, reports, or data.

4.6.3 Analyze

Review the documented lessons learned collectively to identify common themes, trends or recurring issues. Categorize the lessons learned based on their relevance to technical aspects, stakeholder management, communication etc. (this can be done by filtering the Excel file exported from the surveying platform Qualtrics). Analyze the potential impact of each lesson learned on future DISCO-X implementations (Twinning and Follower labs) and determine its significance.

4.6.4 Store

Organize the lessons learned in a structured manner, such as by project phase, category, or topic, to facilitate easy retrieval and reference.

4.6.5 Retrieve

Communicate the availability of the lessons learned repository to the project team members and stakeholders. Encourage various living labs to review relevant lessons learned before starting WP 5 or when encountering similar situations.

4.6.6 Reflection (Continuous Improvement)

Periodically evaluate the effectiveness of the lessons learned process and make necessary improvements. Encourage feedback from project teams and stakeholders on the usefulness of the lessons learned. Update the lessons learned repository with new insights and experiences from subsequent DISCO demonstrations and foster a culture of learning and knowledge sharing within the project to ensure ongoing improvement in the demonstration of DISCO innovations.

The process of capturing lessons learnt and documenting them can be done on a need basis, however, there should still be a Teams meeting quarterly to go through the lessons of the previous 3 months and reflect on these lessons. In doing so, best practices can be identified and summarized. It is advised to allocate an individual from each living lab who will ensure that these lessons are captured timeously and accurately.

5. Conclusion

The report begins by outlining a framework that combines the Agile methodology, the Iterative approach, and the integration of the PI-led Meta Model Suite and Urban Freight (UF) Data Space. This approach aims to effectively manage and advance DISCO's objectives within the context of sustainable city logistics, focusing on integrated and data-driven urban freight initiatives across the four European cities selected as Starring Living Labs, such as Helsinki, Gent, Copenhagen and Thessaloniki. The Agile methodology, known for its flexibility and adaptability, aligns well with the iterative nature of city logistics planning, making it suitable for incorporating the Meta Model Suite and UF Data Space into the Roadmap's activities.

Next, the report explores the implementation of the Roadmap. Through various tools such as completing Factsheets, using the visual collaborative platform, conducting one-to-one meetings, workshops, project meetings, open days, and promoting collaboration and communication, Task 4.1 aims to provide LL leaders with practical methods for executing the demonstrations, to make informed choices, and to closely track advancements. These activities, with the support of the external experts of the Impact Creation Board for Transformation (ICBT) is expected to help each LL to effectively address challenges. From aligning with project goals to conducting local Open Days, these tools are planned to facilitate a smooth progression through development, demonstration, evaluation, and scaling phases.

Furthermore, the Roadmap's adaptability is emphasized. Serving as a dynamic document, it evolves in response to the evolving needs of project partners. As the project advances, the Roadmap's structured approach and insights remain invaluable. It will guide Twinning LLs during their preparatory phase, contribute to the success of Step 3 Early Adopters, and enhance the overall efficiency of project implementation.

Looking ahead to the next phase, the following actions hold importance:

- Working closely with LL leaders to enhance the main project management tool, ensuring consistent visualization and streamlined data sharing throughout the project, e.g. updating the Factsheets.
- Stressing the significance of planning local workshops and Open Days to ensure effective engagement and widespread dissemination.
- Highlighting the importance of providing comprehensive details about tender procedures, as they play a pivotal role in ensuring the precise implementation of the project.

Annex 1. Initial Insights from the Factsheets

The preliminary version of the factsheets, slated for completion in M12 as an outcome of WP4, plays a crucial role in the project's documentation and communication. While the initial presentation of the state-of-the-art for the four Starring LLs, conducted in M3, may not encompass a comprehensive picture of the LLs, its primary purpose is to familiarize the partners involved with the key elements to be considered during the demonstration management.

The factsheets will serve as valuable resources, providing in-depth information about the LLs' progress, achievements, and outcomes, offering valuable insights into the project's implementation journey. By introducing partners to these core elements early on, the LL leaders can align their efforts, make informed decisions, and foster effective collaboration, ensuring the successful execution of the demonstrations. As the project advances, the factsheets will evolve and expand, capturing the LLs' achievements and facilitating the dissemination of their valuable experiences and results to a broader audience.

First remarks on the preliminary version of the factsheets
<p>During the initial exercise in M3, the Task 4.1 leader, while assisting each LL leaders in filling the canvas in the visual collaborative platform, identified both similarities and divergences in the way each LL approached project management. This awareness highlighted the importance of ensuring a consistent alignment with the project's goals, emphasizing the need for iteration planning and continuous communication, particularly in the early stages.</p> <p>ITL's observations revealed that some LLs had a more structured approach to project management, while others were more flexible. Some LLs had already developed detailed project plans, while others were still in the early stages of planning. These differences in approach could potentially lead to challenges in the coordination of activities and the sharing of information.</p> <p>ITL's observations also highlighted the importance of communication and collaboration between the LLs and the project team. By working together, the LLs and the project team can ensure that the project remains aligned with its goals and that the work is carried out efficiently and effectively.</p> <p>These observations provide valuable insights into the challenges of managing a project with multiple LLs. By taking steps to ensure consistent alignment, iteration planning, and continuous communication, the project team can mitigate these challenges and ensure the success of the project.</p>

LL1 - Helsinki

1) Short overview of the Living Lab

The details of city logistics operations have been partially explored, and the LL leader has identified the following:

- HORECA (Hotels, Restaurants, and Cafes): Comprising 22% of the total number of business spaces. Specific flows of food and beverage deliveries are not available.
- Stores and retails sector: represent 35% of the total number of business spaces,
- E-commerce: The percentage of e-commerce as a logistics generator is currently under investigation.

In terms of main logistics operations transport means, vans account for 13% and LGVs (Large Goods Vehicles) for 67% based on data from 2020. Articulated vehicles make up 20% of the transportation mix during that year. The number of electric vans is currently unknown, but their usage is increasing, reflecting the growing

trend towards sustainable logistics solutions. Similarly, data for cargo bikes is not available, but it is worth noting that only a few operators currently utilize them in the city logistics operations.

Helsinki is conducting a research report focused on city logistics flows in the Helsinki region. The research aims to provide valuable insights into the current state of urban logistics. The research report is expected to be completed by January 2024.

2) Qualitative and quantitative targets of the demo activities

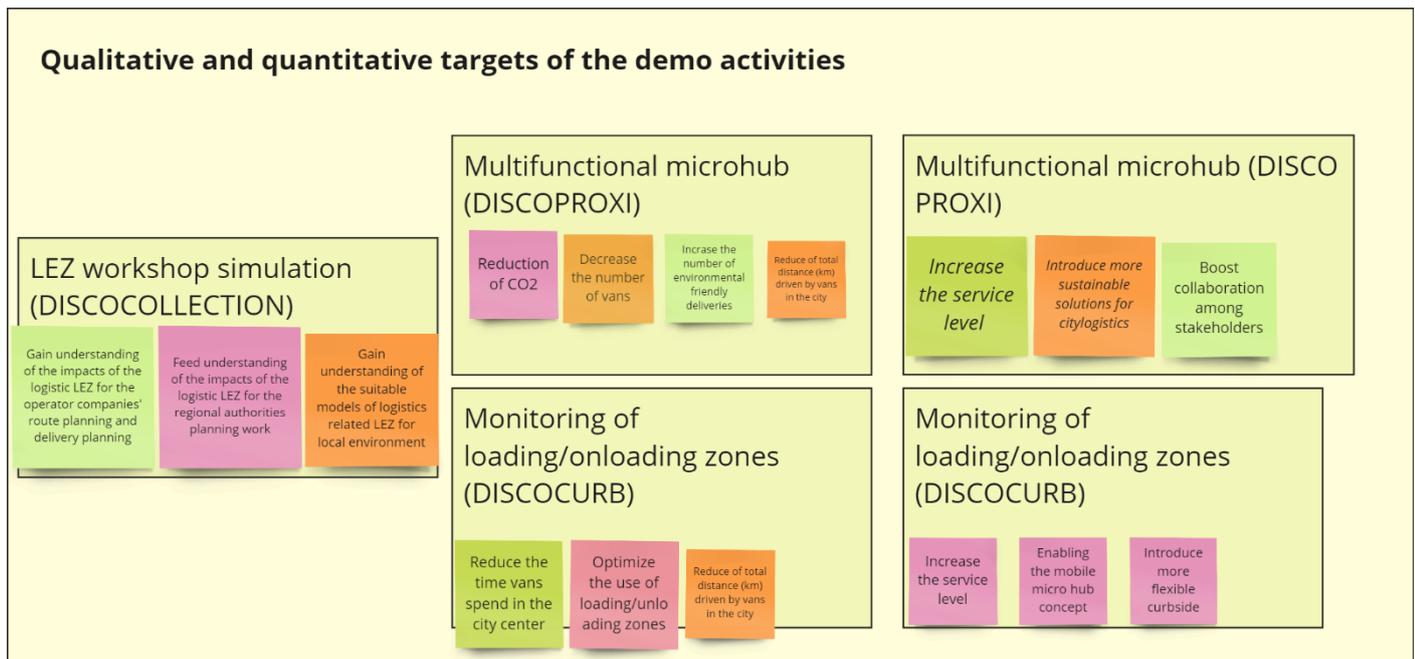


Figure 6 Annex. Qualitative and Quantitative targets for Helsinki LL

3) Strategies

The LL leader has identified a comprehensive set of policies and strategies relevant for the demonstration, encompassing:

- 1) Helsinki Data Strategy: This strategy serves as a guiding framework for the digitalization of the city, enabling effective data-driven solutions and smart city initiatives.
- 2) City Logistics Action Plan: Updated in 2020, the Action plan is not structured as a Sustainable Urban Logistics Plan, but currently corresponds to the same themes as a SULP.
- 3) Carbon Neutral Helsinki - Action Plan: This plan defines specific tasks and action points, driving the city towards its goal of becoming carbon neutral by 2030.
- 4) Monitoring of the Carbon Neutral Helsinki Action Plan: Regular monitoring of the city's climate objectives is conducted to track progress and identify areas of improvement.
- 5) Sustainable Development Goals (SDGs) Alignment: The city has aligned its strategies with the United Nations' SDGs, prioritizing key areas such as clean energy, sustainable transportation, waste management, and social equity.
- 6) Helsinki City Strategy, as described in the [Helsinki City Strategy for 2021–2025](#) that indicates the city's priority for this Council term and for the next decade.

4) Stakeholders' community

During the proposal phase, DB Schenker committed to being a key participant in the demonstration. Specifically, they will be actively involved in the Discoproxi microhub design and activities in Helsinki. DB Schenker will utilize the microhub as an integrated part of their daily delivery operations, showcasing their commitment to sustainable and innovative urban logistics solutions. Another key partner in one of the upcoming demonstrations is HSL (Helsinki Regional Transport Authority). HSL's involvement will be focused on the upcoming Low Emission Zone (LEZ) demo exercise taking place in 2024. The LEZ demo will be executed as a workshop simulation, utilizing non-digital means of participation and collaboration with A2B and DB Schenker. Weekly meetings with the relevant stakeholders are arranged by the LL leader.

The LL leader has identified additional partners to play a crucial role in the LL:

- LMAD - A company specializing in the development of innovative Advanced Delivery (ADV) solutions for last-mile logistics. To be connected to the Discoproxi.
- Fiuge - A small cargo bike delivery company with a unique platform that matches parcels with suitable couriers. To be connected to Discoproxi.
- Tietorahti - A company with extensive knowledge and data related to logistics. To be connected to Discocurb and Discocollection
- The City of Helsinki - The City of Helsinki (especially the Urban Environment Division of the city) will be actively taking part as an enabler in all the DISCO-X demonstrations

The complementary initiatives to create a long lasting collaboration at local level include:

- A) The LL coordinators actively participate in monthly meetings of an **unofficial Helsinki City Logistics working group**. This group brings together various stakeholders, including companies from the retail and logistics sectors, cities, transport authorities, and the chamber of commerce, among others. Through these regular meetings, the LL coordinators collaborate and engage with the wider community.
- B) **Community Engagement:** The city actively involves stakeholders in decision-making processes, encouraging participation and collaboration through public consultations, workshops, and community events. In addition, residents of the City are actively being engaged to various activities to develop their City together with various stakeholders.
- C) **Additional partnerships:** Forum Virium Helsinki, together with the City of Helsinki, continuously fosters partnerships with local businesses, organizations, and academic institutions to leverage resources, knowledge, and expertise in achieving sustainable development goals.

5) Technical activities

Regarding the data collection plan, an initial mapping of available data has been conducted in cooperation with the Urbane project. The project will now continue to collect additional data required for effective urban logistics flows in order to contribute to the UF Data Space.

Measure	Activity
DISCOPROXI:	Operational data, such as fleet data, volume data etc. is shared by the logistics operators utilizing the microhub (A2B, DBS, ROLAN, LMAD, Fiuge + the possible other stakeholders). Monitoring the use and activity of the Hub: ROLAN, FVH
DISCOCURB	Data will be collected from dedicated loading/unloading zones with monitoring gear
Traffic data	Traffic information/situational data from the city/other ongoing projects



6) Necessary aspects to consider for the implementation of the measure

Five essential aspects have been identified in this early phase to facilitate the progress of implementation:

- **Obtaining Permits:** The project is actively working on securing the necessary permits, such as land use permits and electricity agreements (currently under negotiation with the city), to enable the smooth execution of the initiatives.
- **Urban Space Mapping:** An ongoing process of mapping available urban spaces has commenced. This effort has resulted in a list of underutilized and potential spaces that can be optimized for logistics initiatives.
- **Winter Conditions Consideration:** The winter conditions in Helsinki pose challenges to some demonstrations. However, an exception is the Loading Zone monitoring demo, which has potential to be extended to cover winter conditions, providing valuable insights into the capabilities of the technology during challenging weather.
- **Open Communication and Dialogue:** The project emphasizes open communication and collaborative dialogue with stakeholders. This approach fosters joint development of demonstrations, enabling the inclusion of diverse perspectives and expertise
- **Diverse Actor Needs:** The needs of different actors involved in the project may differ. Recognizing and accommodating these diverse needs is crucial for tailoring solutions that are effective and inclusive.

Subcontracting/equipment/tenders overview			
Autumn '23 (Oct. 23)	Winter '23 (Dec.23/Jan.24)	Spring '24	Autumn '24
First microhub demo: a need for container(s). A tender will be send to multiple service providers. DB Schenker possibly offers additional container. TBD: Smart locker system included in the Hub?	Service consultant Design	Microhub facilities (containers, personel facilities etc)	Loading Zone monitoring: tech & equipment for the monitoring demo

7) Open days

OPEN Days are not yet planned and will be defined in specific meetings in September 2023.

LL2 - Ghent

The Ghent living lab aims to create an 'Urban Access Control (UAC)' system, that connects transport planning systems of logistics operators with digitally available city access regulations, to keep all regulation in account already in the planning phase. This avoids unnecessary traffic in the inner city. The system will also give sustainable alternative delivery options, if this is efficient for the logistics operator, for example a logistics operator who has to deliver one pallet in the inner city. City traffic and regulations will also be shared to use on route for logistics vehicles, with a route-app which is also connected to the UAC.

This system requires a safe transfer of sensitive data, for which a data space will be used to ensure the data will be treated correctly and anonymous, without spilling information (client names, pricing,...) between competitors for inner city logistics.

1) Short overview of the Living Lab

In the vibrant city of Ghent, several key industries contribute to the bustling logistics demand. Notably, the hospitality sector, comprising hotels, restaurants, and cafes, accounts for a significant portion of the logistics activity, catering to the city's thriving tourism and gastronomy scene. Additionally, as in many other cities, the construction sector plays a vital role, driving logistics needs for building materials and equipment delivery. With the rising popularity of e-commerce, Ghent witnesses a surge in last-mile deliveries, serving the online shopping demands of its tech-savvy residents. The retail and fashion industries further add to the logistics landscape, necessitating efficient supply chain management to keep up with the dynamic consumer preferences. Finally, waste management emerges as a critical demand generator, requiring an organized logistics network for collection and disposal. These diverse industries collectively shape Ghent's city logistics demand, and effective planning and optimization are crucial to ensure smooth and sustainable urban mobility.

The **Covid-19 pandemic** has significantly impacted city logistics demand generators in Ghent, reshaping the logistics landscape in unprecedented ways. With travel restrictions and social distancing measures in place, the hospitality sector experienced a sharp decline in activity, resulting in reduced demand for logistics services catering to hotels, restaurants, and cafes. Similarly, the construction industry witnessed disruptions due to lockdowns and supply chain challenges, affecting the logistics demand for building materials and equipment. Conversely, the pandemic accelerated the growth of e-commerce, leading to a surge in last-mile deliveries as more people turned to online shopping. The retail and fashion industries also faced shifts in consumer behavior, requiring flexible logistics solutions to adapt to changing demands. Moreover, the waste management sector faced fluctuations in logistics requirements, with changes in waste generation patterns during lockdowns and reopening phases. As Ghent navigates the ongoing impact of the pandemic, logistics stakeholders must remain agile and responsive to dynamic changes in demand to ensure the resilience and efficiency of city logistics operations.

In the diverse logistics operations of Ghent, various types of vehicles and vessels play crucial roles in moving goods efficiently and sustainably. Diesel and gasoline vans, along with biodiesel and compressed natural gas (CNG) vans, form the backbone of last-mile deliveries, providing flexibility and reach in urban areas. Large Goods Vehicles (long-haul trucks) are essential for transporting goods over longer distances, ensuring the seamless flow of products in and out of the city. Electric vans are gaining prominence as eco-friendly alternatives, contributing to reduced emissions and quieter urban logistics. Cargo bikes serve as nimble solutions for last-mile deliveries in congested areas, promoting eco-friendly transportation and enhancing accessibility to various locations. Moreover, inland barge vessels play a vital role in waterborne logistics, efficiently transporting bulk goods along Ghent's waterways, reducing road congestion, and minimizing environmental impacts. By leveraging this diverse fleet of vehicles and vessels, Ghent's logistics operations optimize efficiency while advancing sustainable practices to foster a greener and more resilient urban mobility landscape.

The next step includes to detect the percentages.

2) Qualitative and quantitative targets of the demo activities

The project aims at enhancing city logistics in Ghent and focuses on four key goals that contribute to transforming urban mobility and logistics operations.

Firstly, **increasing sustainability** is a fundamental objective, aiming to reduce the environmental impact of logistics activities by promoting eco-friendly transportation modes, adopting clean energy sources, and optimizing routes to minimize emissions. One key aspect includes reducing the overall number of (diesel) vans entering the city.

Secondly, the project aims to enhance safety by implementing innovative technologies and intelligent solutions to mitigate potential hazards and accidents, ensuring the well-being of both pedestrians and drivers. Two key aspects to accomplishing this goal are **reducing the overall number of vans entering the city during active hours and reducing the number of vans driving through citizen-sensitive environments like school zones.**

Thirdly, the goal of increasing efficiency seeks to streamline logistics processes, utilizing advanced data analytics and optimization tools to **optimize delivery schedules, reduce idle time**, and enhance overall productivity. Targets should focus on ensuring **higher consolidation of low fill-rate transport** through City Hubs and reducing the total number of km traversed by vans in the city.

Lastly, **reducing planning errors** is critical for efficient logistics operations, and the demo activities should focus on reducing the number of orders that are not taken or returned by the transporters. By pursuing these four ambitious goals, the project sets the stage for a more sustainable, safe, and efficient city logistics ecosystem in Ghent, enhancing the overall quality of urban life and supporting economic growth.

3) Strategies, facts and figures

Ghent's strategy will aim to align to the following policies.

- Sustainable Development Goals (SDGs) Alignment: The city has aligned its strategies with the United Nations' SDGs, focusing on key areas such as clean energy, sustainable transportation, waste management, and social equity.
- Climate Action Plan: Example City has developed a comprehensive Climate Action Plan, outlining specific targets and actions to mitigate climate change and adapt to its impacts.

At this stage the LL leader is formulating approach and questions related to the implementation:

- Define stakeholder participation strategy: how to engage logistics providers to test the Urban Access Controller in Ghent? How to involve other cities for adoption/exploitation of the system?
- Define the role of the data-space. In an ideal situation, all actors are connected to the data-space and the UAC will be an application that is also connected to the data-space. But this will make the dependency on the data-space huge, so if the data-space would fail/too expensive/not practical in use, the system becomes unapplicable. A second option would be to link the actors with the UAC (or only the cities, or only the TMS-systems) and link the UAC to the data-space to gain insights into the process. This would provide an option for the UAC to live on if the data-space technology would not be on point before the testing period starts.
- Define the integration/interaction with similar data systems: How system create for Ghent will integrate and complement other similar systems within the country? What will be the input at national level?

4) Stakeholder's community

Including stakeholders in the process of planning changes to Ghent's city logistics is crucial to ensure that diverse perspectives and needs are considered, leading to more inclusive and effective solutions. Engaging

stakeholders fosters collaboration, allowing for informed decision-making, and garnering the necessary support for successful implementation, creating a more sustainable and responsive urban logistics system. For Community Engagement, the city actively involves stakeholders in decision-making processes, encouraging participation and collaboration through public consultations, workshops, and community events. With regards to partnerships, the initiative Example City fosters partnerships with local businesses, organizations, and academic institutions to leverage resources, knowledge, and expertise in achieving sustainable development goals.

The following list provides key actions in order to ensure the efficient involvement of stakeholders.

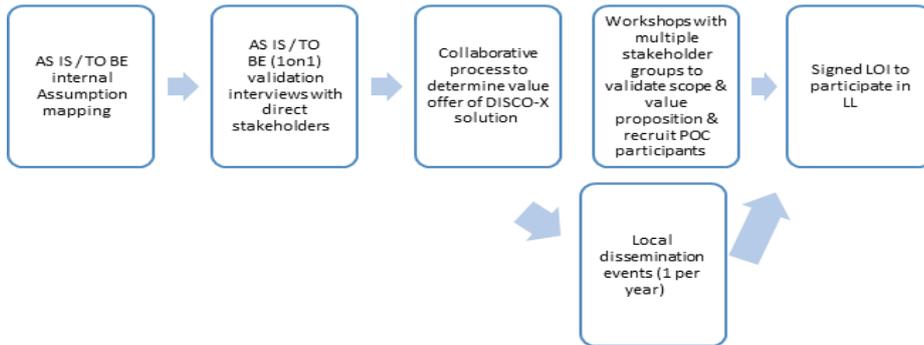


Figure 7 Annex. Stakeholder's involvement flowchart

Beyond the aforementioned stakeholders, there are further stakeholders to be involved including:

- partnerships with similar projects coordinated approach
 - GreenLog: marketplace last-mile providers
 - Citerra: city policy dissemination (local project)
 - 'Slimme Stadsdistributie' (local project)
- software providers
- last-mile providers
- city officials
- Long-haul planners and transporters.

The following graphic presents a collective appraisal of the direct users, secondary users and indirect stakeholders for LL4: Ghent.

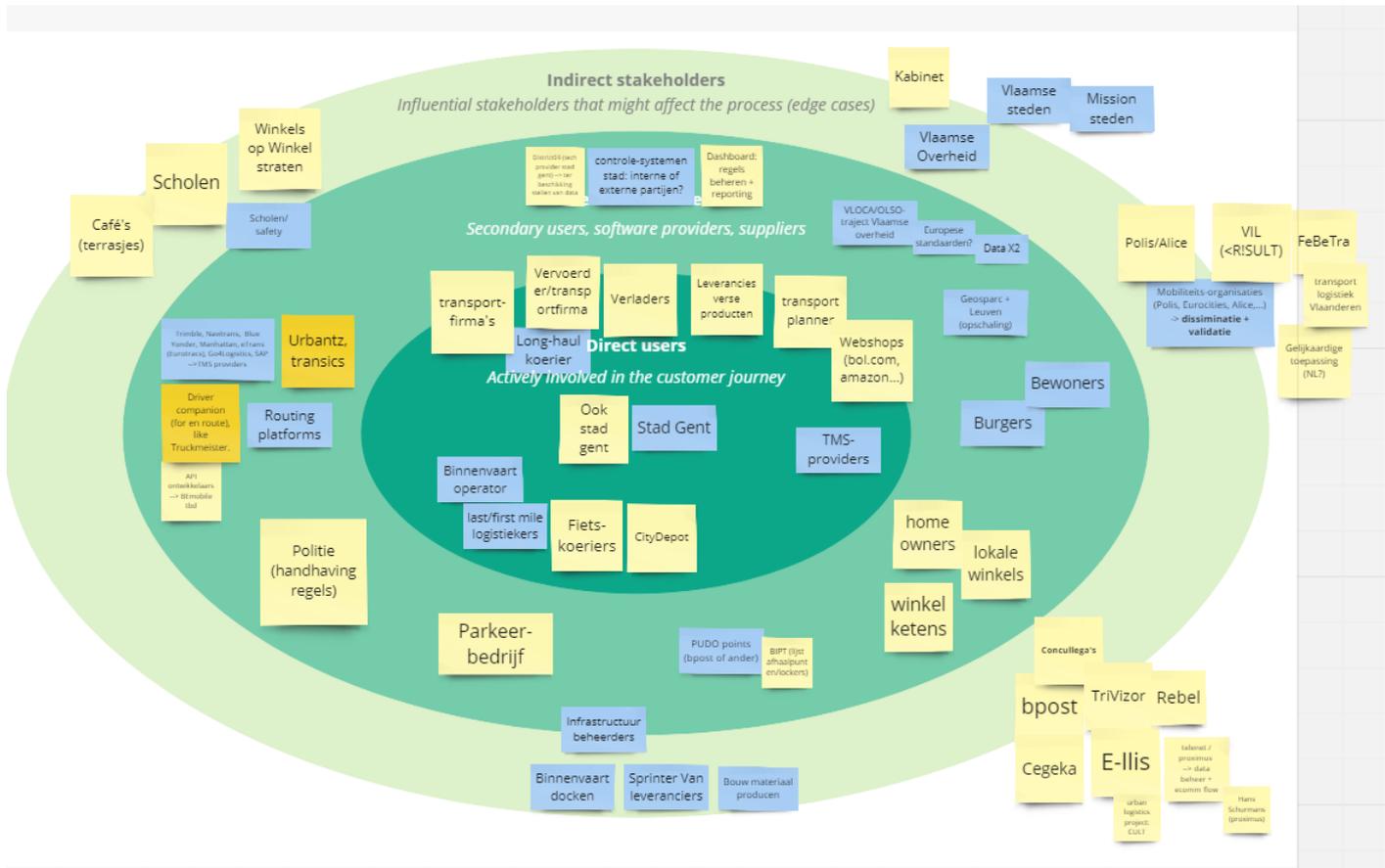


Figure 8 Annex. Stakeholder levels of involvement

5) Technical Activities, Key Milestones and Timelines

Ghent has started to elaborate the demo plans around four main questions.

- How to implement the measures?
 - Identifying a set of Push and Pull actions that contribute to the interconnected data space creation as represented by Figure 5.
- How to reach the targets?
 - Testing and dissemination of the LL
 - Defining and validating the viability of the business model towards LSPs
 - Setting up the governance of the DISCO-X solution for further exploitation after the project
- How to involve stakeholders?
- How to promote the data-space?
 - This is a crucial question for Ghent due to the need to comply with national regulation and offer a solution replicable in other cities around the country

The following graphic is a visual representation of the interconnected data-space and how the Urban Access Control, TMS of national logistics players, CRM of Local Green Last-mile provider, and City Access Policy Management Platform interact.

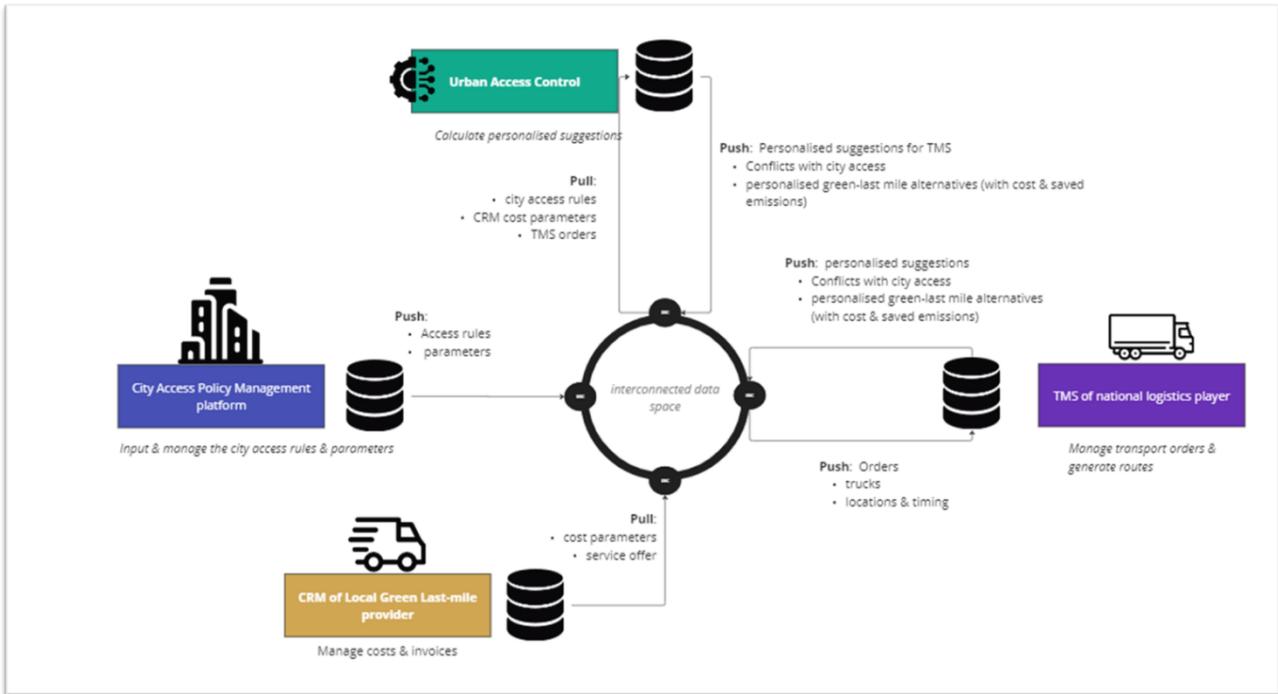


Figure 9 Annex. Interconnected data-space and local systems

The following table represents the functional diagram how systems will be interconnected after full implementation.

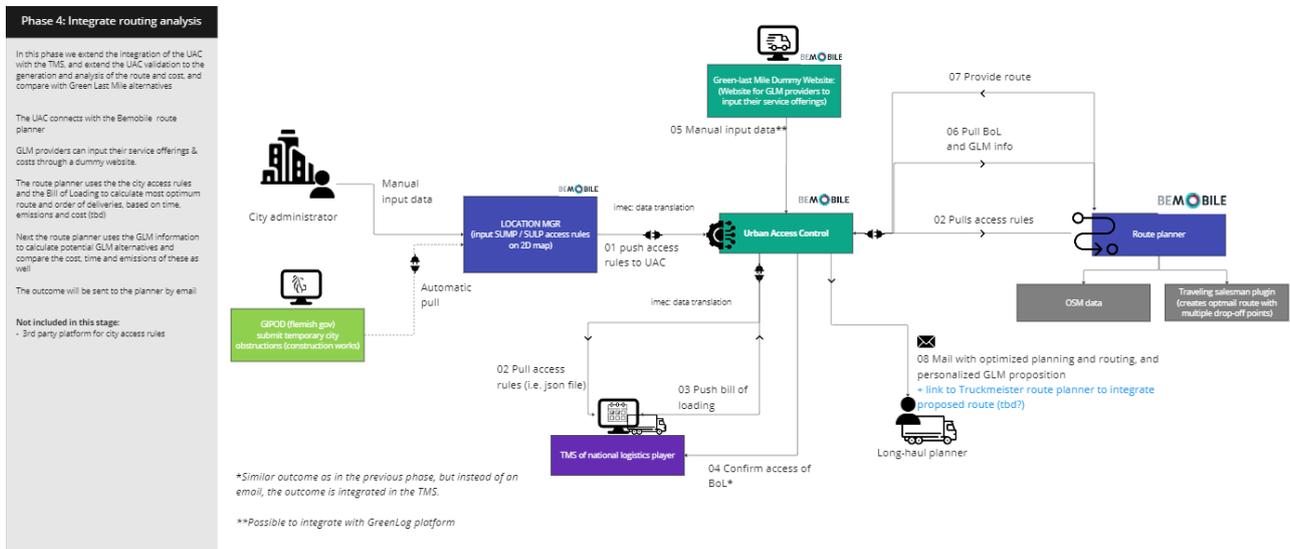


Figure 10 Annex. Interconnected systems after implementation

The following table presents the LL4: Ghent timeline with key milestones and their associated deadlines, helping to track progress and ensure timely completion of activities.

Timeline			
Description	Responsible partner	Participating partner	Deadline
risk management: detection + measures	VIL	ALL	01/06/2023
Stakeholder mapping in living lab	VIL	ALL	01/07/2023
listing of existing traffic regulation with impact on logistics, defining digital availability of those rules	Stad Gent	BeMobile	01/07/2023
listing available data-sources in the city	Stad Gent	BeMobile/Imec	01/07/2023
customer journey description	Imec	Stad Gent, VIL, OHB, BeMobile	01/07/2023
finishing scoping + knowledge transfer internally	Imec	ALL	07/07/2023
explanation TOKEN + DAC to partners	Imec	Bemobile	07/07/2023
Dataspaces explanation to partners	Imec	all	07/07/2023
Explanation DAC possibilities + architectural design	Imec	all	07/07/2023
1st version of architectural design	BeMobile	Imec	01/08/2023
Stakeholder mapping	VIL		01/08/2023
defining stakeholder participation process in LL	VIL / Stad Gent	ALL	01/08/2023
1st version of UAC ready for simulation testings	BeMobile	Imec	01/01/2024
Fact sheets at starring living labs: established communities, communication rules, main values, principles, and benefits descriptions based on stakeholders needs, local relations and a shared manifesto at Starring LLs	VIL / Stad Gent	ALL	01/05/2024
Start physical testings	VIL	ALL	01/05/24
Starring LL measures implementation: Urban Freight Efficient Servicing and Delivery Plans at Starring LLs, with measure implemented, compliant with the Meta Model Suite and UF data sharing community operational	VIL	ALL	01/05/25

Table 2 - Timeline for the Ghent LL measures

The Ghent data collection plan should:

- Determine data requirements
- Determine data owners (stakeholders)
- Define & include the business model for data providers
- ensure GDPR compliance
- Determine data availability (identify sources)

The following is a collective overview of the status of subcontracting/equipment/tenders.

- Three subcontracting budgets
 - 2x Subcontracting for TMS integration
 - 1x subcontracting budget for waterway barging use case development
- first list of potential subcontractors identified
- use cases still need to be further refined before outreaching to specific subcontractors
- Expected beginning Q4 2023

6) Necessary aspects to consider for the implementation of the measures

LL leader identified a preliminary set of aspects, including:

- What is the level of data quality of city obstructions? This is often input manually, which may not always 100% complete.
- What is the scalability of Integrations with TMS systems? Large companies often have their own TMS system.
- What availability of historic data for digital twin strategic simulations?

- What is the required development effort for Digital Twin use case?
- How do transporters behave en route? They might not check the guidance app while driving.
- What permits are necessary?
- What is the cost of implementation for stakeholders (transport companies)?
- Sensitive data will be necessary during testing, for example private delivery addresses. Is this GDPR-compliant?
- What is the flexibility of planners to change delivery times/transport?
- Is there space available?

7) Open days

OPEN Days are not yet planned and will be defined in specific meetings in September 2023.

LL3 - Copenhagen

The **primary ambition** of the project is to develop a logistic DT that acts as a decision support system for investigating and exploring potential effects of new measures and infrastructure interventions. This system will be developed through co-creation and active collaboration with various stakeholders, including city authorities, transport operators, logistics companies, and other relevant entities. By harnessing the collective expertise and insights of these stakeholders, the DT will become a dynamic and comprehensive platform capable of making informed and data-driven decisions, enabling efficient logistics planning, and optimizing the impact of infrastructure interventions on urban mobility. The data and knowledge acquired from the project's logistic DT and collaborative efforts with stakeholders will culminate in an upgraded Sustainable Urban Logistics Plan (SULP).

1) Short Overview of the Living Lab

The city of Copenhagen has a population of approximately 650,000 inhabitants, while the Capital Region, which includes Copenhagen and its surrounding areas, has a population of approximately 1,9M.

Three main partners of the Living Lab (LL) are the municipality of Copenhagen, the Capital Region, and the Research Institute IRT-SystemX.

Regarding the **freight generators**, the city of Copenhagen and the Capital Region currently lacks knowledge of the volumes of deliveries generated by specific shop categories, insight in the freight companies' routes, type of vehicle etc.

The identified measures contribute to the crucial step in filling the current data gap. As the demonstration progresses, and **data from freight companies** starts to flow in during autumn/winter 2023, there is an expectation for significant improvement in understanding deliverables of goods. This is a fundamental step to set up the **Digital Twin measure**.

With the objective of comprehensively understanding the diverse flows circulating in the city, Copenhagen has adopted a proactive approach by inviting a wide array of players to participate in the DISCO Living Lab project. Notable companies such as IKEA, Arla, L'Oréal, Bestseller, and Coop have been included in this selection. A more detailed list of these key industry players is provided in the paragraph 5.3.4 dedicated to the Stakeholders community.

The city logistics operations in Copenhagen involve the use of diesel vans, Large Goods Vehicles (LGV), and electric vans. Additionally, cargo bikes are gaining popularity as an alternative and sustainable transport

option. However, currently, the city of Copenhagen lacks a clear understanding of the distribution and percentage of deliveries and trips conducted using each transport means.

2) Qualitative and quantitative targets of the demo activities

Copenhagen LL leader classified the main targets for each of the demo activities in the following table.

01_DISCOPROXI	
Establish collaboration with stakeholders to develop best practice of micro hubs and shared transport facilities. Continuous workshops with freight companies and companies. Advisory Board established.	Main target: Develop best practice used for SULP
02_DISCOCURB	
In the Inner-City of Copenhagen more than 50% of the parking lots will be removed in 2024. Innovative ideas for logistic is therefore needed – e.g., cycle logistic and shared space	Main target: Collaboration with stakeholders to use shared space/curb/find new ways to deliver in the Inner-City and test the ideas
03_DISCOBAY	
Facilitate collaborations for last/first mile distribution in one of the main logistic centers and e.g., establish more electric charging stands.	Main target: Establish collaboration with users of logistic center in Høje Taastrup
04_DISCOLLECT	
Digital Twin: Collect data from freight companies to model use cases in the Digital Twin for logistic. Use cases made in collaboration with stakeholders; KPIs e.g., time reduction, new micro hubs, less CO2, use of cargo bikes etc.	Main target: Gain data from freight companies and companies and use it in Digital twin

Table 3 - Demo activities for Copenhagen and related targets

3) Strategies Facts and Figures

Copenhagen Living Lab will contribute to the project by offering a comprehensive and **updated Sustainable Urban Logistics Plan (SULP)**. This updated SULP aligns with the city's strategic goals and reflects the latest developments and challenges faced by the logistics sector in the city.

The findings and outcomes from the Copenhagen Living Lab will be disseminated and **shared with other municipalities in the Capital Region**. By sharing the knowledge, best practices, and lessons learned from the Copenhagen Living Lab, other municipalities can benefit from the valuable insights gained during the implementation and evaluation of urban logistics measures.

4) Stakeholder's community

During the proposal phase, a robust and strong partnership has been established, involving key stakeholders from various sectors

- Freight network (NOVELOG) with +70 stakeholders
- Green Mile with Danish Chamber of Commerce,
- Confederation of Danish Industry,
- Electric Vehicle Network,
- Bicycle logistic network,
- Municipality network.

The project team is actively engaging with freight companies and other relevant entities to expand the partnership of stakeholders. Efforts are being made to invite them to join the Living Lab and its initiatives. On the 5th of September, the local kick-off meeting is scheduled, where more than ten freight companies and food and non-food retailing companies have been invited, as reported in Table 5. This first event has the goal to set up an open dialogue with the retail companies, manufacturers and freight companies who will potentially participate in the Living Lab. With the companies that are or will be part of the project, the Living Lab partners has planned to organise one-to-one meetings and workshop with larger groups of stakeholders.

	Invited for the kick off meeting	
Freight companies	<ul style="list-style-type: none"> – Danske Fragtmænd – Bring – UPS – PostNord – DSV – GLS 	<ul style="list-style-type: none"> – AncoTrans – SystemTransport – Frode Laursen – Citylogistik – DAO – SFT Logistics
Retail sector and food and non-food manufacturing	<ul style="list-style-type: none"> – Henrik Tofteng – Remonis – Lyreco – Kemp & Lauritzen – Ikea – COOP – Arla – Låntmannen Schulstad – Rema1000 – Lóreal – H&M – Bestseller – AB-Catering 	<ul style="list-style-type: none"> – Jem&Fix – Jeudan – Salling Group – Matas – GSK – Nemlig.com – Årstiderne – Magasin – Hofor – Lomax – Carlsberg – BC-Catering – LIDL

Table 4 - Companies invited to the Copenhagen kick off meeting in Sept.

The Living Lab activities include establishing an advisory board with participation from Gehl Architects JaJa Architects, Cowi, Concito, Beta Mobilitet and other stakeholders. The advisory board will hold 1-2 meetings per year, providing valuable insights and expertise to enhance the project's strategies and promote successful implementation.

5) Technical Activities, Key Milestones and Timeline

One of the technical activities for the Living Lab has been to map the data that is available and the data that is needed to feed the Digital Twin of logistic. The leader of the LL drafted the data collection plan as reported in Table 5.

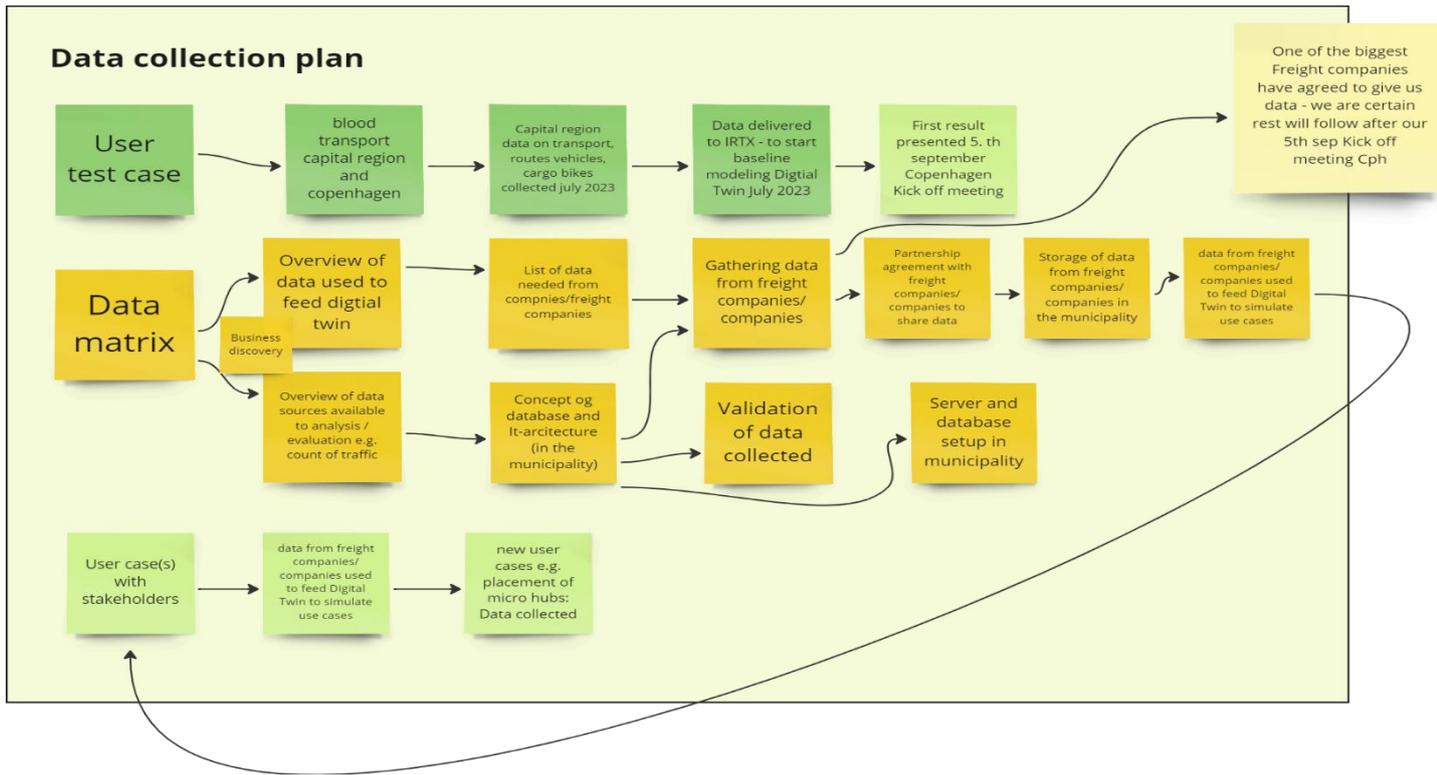


Table 5 - Data collection plan drafted by Copenhagen LL leader

The timeline for Copenhagen spans until April 2024, presenting a well-structured roadmap for the LL’s activities as described in the Table 6. Throughout this period, the project will focus on key macro activities to ensure successful implementation:

- Stakeholder Involvement
- Data Collection
- Digital Twin for Logistic
- Tenders
- Sustainable Urban Logistics Plan (SULP)
- Data Storage

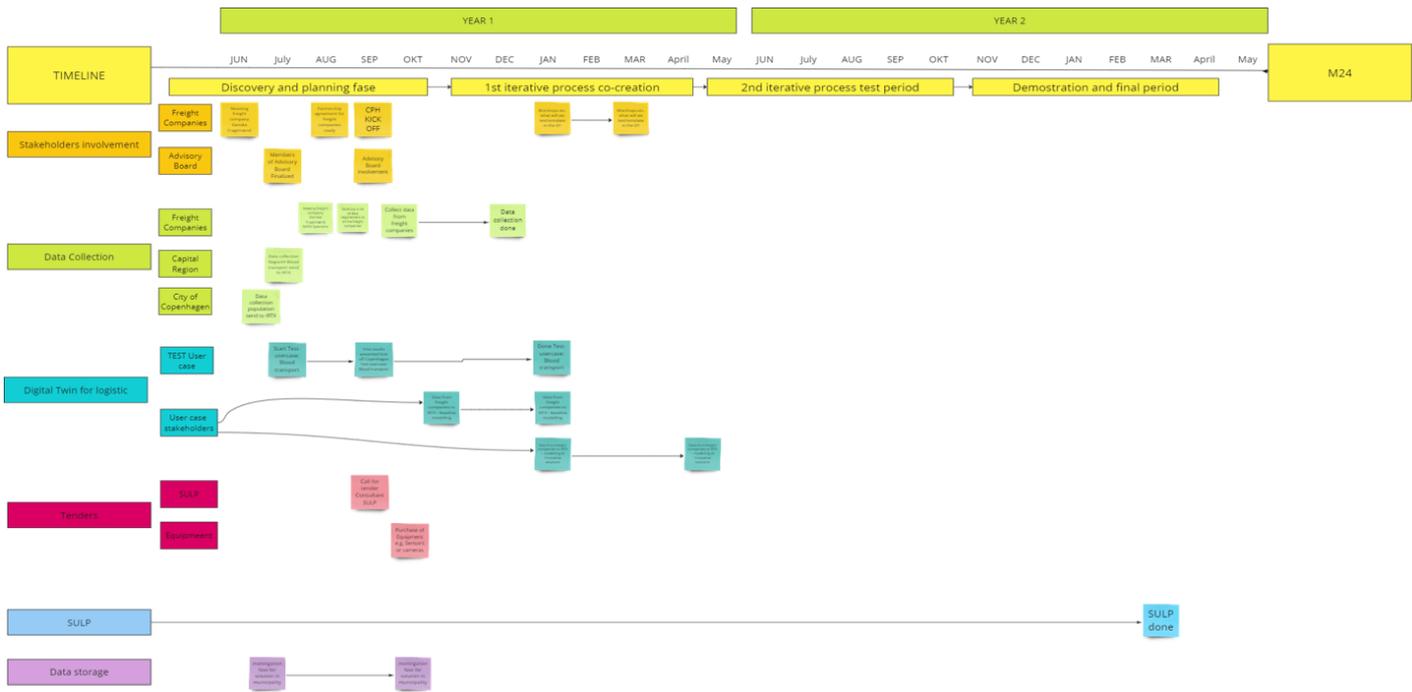


Figure 11 Annex. Gant chart for Copenhagen

6) Necessary aspects to consider for the implementation of the measures

The lack of data, time constraints, requesting permits, and complying with legislation are essential aspects to consider as the first necessary steps for starting the implementation process.

7) Open days

The date for Open Days has not been set yet.

LL4 - Thessaloniki

Thessaloniki, benefitting from the already well-established Living Lab ThessM@LL, will significantly advance in dynamic use of unexploited lands, with on-demand warehousing, more specifically serving fashion and HORECA, and drive the application of smart, data-driven, and cooperative urban logistics schemes, for achieving the city’s sustainability targets for a climate-neutral city by 2030. Thessaloniki LL will make use of underused spaces (temporarily) as logistics hubs (freight hotels), supported by optimally located smart data collection via road sensors, to reduce the number of delivery vehicles in public spaces, and traffic congestion, and improve citizens' quality of life. The core of the demonstration is done at the TIF/HELEXPO, operating as a retrofitted hub.

1) Short Overview of the Living Lab

Thessaloniki, a bustling university city, is known for its high population density and diverse land uses, encompassing residential, educational, commercial, business, and leisure areas. With a total population of 1,106,730 in the agglomeration and 814,524 within the municipality, the city faces the challenge of limited public spaces to cater to the needs of its inhabitants.

At the heart of Thessaloniki lies the city centre, with a population of 325,182 people occupying an area of 19.3 square kilometres. This vibrant area serves as a hub for various logistics demand generators that drive the city's economic activities. Notably, the fashion industry and the HORECA sector (Hotels, Restaurants, and Cafes) play a significant role, with a sample of 1,500 shops revealing that 23% of these establishments belong to the HORECA sector, 4% deal with electronics, and 44% are involved in the clothing and fashion industry.

Moreover, with the surge in online shopping post-Covid-19, the e-commerce sector has experienced a remarkable 22% growth, and this trend continues to rise. As a result, the need for last-mile logistics within the City Centre continues to grow steadily, but it also brings about a considerable rise in emissions, making the need for adopting green solutions more crucial than ever. As Thessaloniki strives to embrace the future, the city has set ambitious goals, including the digital transition of its logistics systems to foster innovation, aiming to become a CO₂-neutral and zero-emission city by 2030. Thessaloniki, also, was selected to participate in the European mission for the 100 Climate Neutral and Smart Cities by 2030!

Furthermore, the city authorities seek to optimize the use of public spaces by implementing dynamic city logistics configurations to tackle uncertainties. To achieve these objectives successfully, Thessaloniki emphasizes the need for an ecosystem alliance for logistics innovation at both urban and regional levels.

In terms of the current regulatory framework, Thessaloniki already has a Sustainable Urban Mobility Plan (SUMP) in place, and work is underway to develop a Sustainable Urban Logistics Plan (SULP). Existing city logistics policies include time windows for loading/unloading, night operations, parking regulations, and weight/size restrictions to streamline logistics activities.

Moving forward, the city is planning to implement further city logistics policies in the SUMP/SULP, such as zero/low emission zones, an urban delivery management system, and low traffic zones, all aimed at promoting environmentally friendly and efficient logistics practices.

With a vision of becoming a model for innovative and sustainable city logistics, Thessaloniki is dedicated to transforming its logistics systems and urban infrastructure, fostering a greener and more prosperous future for its residents and businesses alike.

Typology

Thessaloniki can be classified as a historic and cultural city with a rich heritage. It is the second-largest city in Greece and serves as an important economic, cultural, and transportation hub in the northern part of the country. Thessaloniki has a diverse typology that combines elements of a historic city, a modern urban center, and a bustling port city.

- **Historic Core:** The city's historic core is characterized by narrow streets, traditional buildings, and significant landmarks such as the White Tower, Rotunda, and Byzantine Walls. This area showcases the city's historical importance and preserves its ancient heritage.
- **Commercial Districts:** Thessaloniki has vibrant commercial districts, including Aristotelous Square and Tsimiski Street, which are known for their shopping, dining, and entertainment options. These areas feature modern buildings, commercial complexes, and a lively atmosphere.
- **Residential Areas:** Thessaloniki comprises various residential neighbourhoods, each with its own distinct character. Examples include Kalamaria, Panorama, and Stavroupoli, which offer a mix of apartment buildings, houses, green spaces, and amenities.
- **Industrial Zones:** The city has industrial areas, particularly in the western and eastern outskirts, where manufacturing and industrial activities take place. These zones are characterized by warehouses, factories, and logistics centres.
- **Industrial Area of Sindos:** Sindos has developed into a prominent industrial hub over the years. It hosts a diverse range of manufacturing and industrial facilities, including factories, warehouses,

distribution centres, and logistics companies. Industries such as textiles, food processing, chemical production, metalworking, and automotive components are represented in the area. Due to its strategic location and well-developed infrastructure, Sindos serves as a crucial logistics hub. Its proximity to Thessaloniki Port facilitates easy to import and export activities, allowing efficient movement of goods by sea. The area's connectivity to major road and rail networks enables seamless transportation of goods to and from other parts of Greece, the Balkans, and Europe.

2) Qualitative and quantitative targets of the demo activities

THESS_01_DISCOPROXI:

To demonstrate innovative business models and services for free space use, by adopting smart contracts. The city community aims to enrich with blockchain the WareM&O (Warehouse as a Service) community platform solution which already integrates a fair pricing algorithm for facilitating business agreements in WaaS. The resulting flexible and improved space management will better serve e-commerce needs, resulting in a mitigation of the negative effects in quality of life and operations. It will be done by a) identifying strategically positioned proximity areas as off-road places dedicated to L/U nearby destination to reduce vehicle trips; b) adopting innovative business models and services for free space utilization with smart contracts.

- a) Qualitative targets: To shape the conditions so as to give a percentage of designated spaces within the TIF HELEXPO exhibition area to the logistics provider for the needs of the pilot's objectives (smart delivery office, warehouse, parcel lockers etc.).
- b) Quantitative targets: To provide at least 200 sq.m. of available space to the logistics provider for the needs of the pilot's objectives (smart delivery office, warehouse, parcel lockers etc.).

THESS_02_DISCOESTATE:

To demonstrate temporary/multipurpose and optimal use of strategically positioned buildings at the TIF HELEXPO Exhibition Centre as a logistics hub (when events aren't taking place) to operate with shared transport and logistics facilities (e.g., freight hotels) and their optimization through smart solutions and tools and green last mile solutions.

- a) Qualitative targets: To enrich the WareM&O database will all the available buildings that fulfill the minimum specifications to potentially used as city hubs.
- b) Quantitative targets: The building at TIF HELEXPO Exhibition Centre was selected to fulfil specific requirements. The designated area was necessary to exceed 200 sq.m. in order to ensure ample space for operations. The parcels to be handled should be strictly non-organic, and the handling of fresh products will not be accommodated since there is no that keeps the temperature stable. It's essential that the area is equipped with a reliable internet connection to facilitate seamless logistics and communication. The location of the logistics zone is crucial; the selected building is on the ground floor, with both the entrance and storage sectors near the parking lot for swift and efficient loading and unloading processes. The area is near a parking lot to avoid any potential congestion and ensure the smooth transition of goods. The loading/unloading operations can take place all 24 hours to meet the diverse logistical needs. Finally, access to the TIF HELEXPO area is permitted and the company's freight vehicles will be allowed to enter, ensuring a standardized approach and enhancing security measures.

THESS_03_DISCOBAY:

To map underused infrastructure to be used as freight hotels and enrich the WaaS data space with other unexploited areas and land available and managed by the municipality to create an integrated space availability observatory for Thessaloniki.

- Qualitative targets: To analyse the current e-commerce demanding, together with demographics (population, density, etc) in the city of Thessaloniki and detect the most suitable areas of a city that the parcel locker should be installed.
- Quantitative targets: To find a dedicated area and install parcel locker that will be used together with the consolidation hub in TIFF HELEXPO.

THESS_04_DISCOLLECTION:

To implement advanced freight modelling techniques and data analytics solutions for optimising freight flows at the TIF HELEXPO exhibition centre during the exhibition’s period utilizing smart sensors installed on the road infrastructure and at gates of the EXPO Centre for real-time data collection.

- Qualitative targets: Define the minimum set of data and the interoperability requirements between the different systems of the network.
- Quantitative targets: To enrich the database of Thessaloniki Smart Mobility Living Lab (ThessM@II) and strengthen the data collection regarding overall demand and supply for the last mile and also data-related optimization of the operations.

3) Strategies Facts and Figures

Digital experience:

ThessM@LL: In terms of Digital experience HIT/CERTH has developed for Thessaloniki a Smart Mobility Living Lab. Thessaloniki stands as one of Europe's most extensive Living Labs, utilizing its entire cityscape as a testing ground for advanced technological and innovative solutions in mobility. This includes cooperative and autonomous vehicles, with plans to extend the platform's scope to encompass freight transport in the near future. Thessaloniki is now on the list of smart cities in the mobility sector, and this would not have been possible without the involvement of the bodies that make up the ecosystem of the city, which has been created over the last decade and is constantly growing. In this ecosystem, various operators and businesses are involved in providing data or expertise to create the right conditions for the exploitation of this infrastructure for the benefit of citizens. The Thessaloniki Smart Mobility Living Lab includes, among others:

- Real-time traffic data in Thessaloniki (cars and trains),
- Path prediction and Dynamic rerouting,
- Collaborative city logistics service & matchmaking tools for consolidation of cargo,
- On-demand warehousing services,
- Distribution planning optimization tools and services,
- Tools for policymaking and consensus building,
- Short-term predictions of traffic conditions from multiple sources,
- Exporting and formulating mobility and activity patterns,
- Extended IoT equipment.

The key digital systems operating in Thessaloniki that will affect Living Labs operations:

- Intelligent Traffic Management System is a system that uses sensors and cameras to monitor traffic flow and adjust traffic signals in real-time to optimize traffic flow. It provides automation of traffic management processes on a daily basis, the capability of coordinated traffic management by the operator in case of emergency events and automatically, as well as calculation of performance indicators for monitoring of signaling system performance by the operator and utilization in decision making.

- Traffic Thess which provides live traffic updates in Thessaloniki, Greece. It shows the traffic situation on the roads of Thessaloniki and the surrounding areas, including Chalkidiki, Serres, Kilkis, Pella and Imathia.
- OASTH Telematic Passenger Information System is a system that operates within Thessaloniki's Public Transport Operator and provides real-time information on the location of buses and their estimated arrival times at bus stops in Thessaloniki.
- Smart Parcel Lockers are autonomous container technology used for storing online delivered parcels or packages. This technology offers a secure and convenient way of managing packaged deliveries.
- Electric Light Commercial vehicles (E-LCVs) are commercial vehicles that run on electricity instead of gasoline or diesel fuel. They are environmentally friendly and have lower operating costs than traditional vehicles.

WareM&O:

WareM&O is a smart platform developed by HIT/CERTH. It operates as a Virtual Freight Center which matches the supply and demand of storage space in real-time, using blockchain technology and smart contracts. Behind the scenes:

1. It collects and analyzes data from various sources, such as sensors, GPS, RFID, and IoT devices, to monitor the availability, location, condition, and quality of the storage spaces and the stored goods.
2. It uses artificial intelligence and optimization algorithms to match the storage requests with the best available offers, considering factors such as price, distance, duration, capacity, and service level.
3. It facilitates the transactions between the storage providers and the storage seekers, using blockchain technology and smart contracts to ensure security, transparency, and trust.
4. It provides a user-friendly interface for both the storage providers and the storage seekers, where they can register, browse, book, pay, and rate the storage services.

Already implemented City Logistics rules:

- **Time windows** for loading and unloading restrictions (At most pedestrian areas of the historical centre, loading and unloading is permitted from 06:30 to 08:30 (morning) for trucks up to 8 tons at the historical centre, trucks up to 1,5 ton are permitted regardless of the time or day),
- **Night operations** for loading and unloading (Trucks up to 8tns: weekdays from 20:30 to 08:30 the next day and weekends from 17:00 (Sat) to 08:30 (Mon)),
- **Parking regulations** for loading and unloading restrictions (1.5-ton trucks are allowed to park only in special spaces)
- **Size or Weight restrictions** for trucks entering the city.

Impacts of already implemented rules so far in Thessaloniki:

The Sustainable Urban Mobility Plan of Thessaloniki has identified

- insufficient number of parking spaces for goods vehicles,
- nuisance,
- incomplete planning,
- non-observance of special loading and unloading hours

as key issues in regard to the Urban Freight transport of Thessaloniki. The horizontal policies that the SUMP of Thessaloniki suggests is the organization of the urban distribution system should consist of:

- the inclusion of loading and unloading parking spaces in the system of parking management in order to better supervise and use them and
- the establishment of nighttime distribution of goods.

The next Urban mobility policy measures that are planned to be applied in Thessaloniki as proposed by the SUMP:

- **Zero emission zones** (allowing only electric cars and emergency vehicles to use the specific road),
- **Low emission zone** to the historical city centre (LCVs only during specific time window),
- **Urban Delivery management system,**
- **Low traffic zones.**

4) Stakeholder's community

Baseline information: Mapped during the proposal phase. In the document, please explain how they will be involved

LIVING LAB COORDINATOR: CERTH/HIT is leading Thessaloniki's Starring Living Lab in Greece. Responsible for the Development of all the tools associated with the work to be done. Enhance Blockchain solutions.

INFRASTRUCTURE PROVIDER: TIF HELEXPO SA is the national entity for the organizing of exhibitions, congresses, and cultural events in Greece and a big generator of freight flows. It organizes more than 20 trade fairs with exclusive brand names, Thessaloniki International Fair being its flagship. Established with a rich history, it has become a leading destination for trade fairs and conventions, attracting participants and visitors from across the globe. To meet the requirements of DISCO, the exhibition centre will function as a proof-of-concept element by providing available spaces to Logistics Providers, enabling them to explore dynamic uses of underused and unexploited areas within the Exhibition Centre premises.

LOGISTICS SERVICE PROVIDER & DATA PROVIDER: ACS is the biggest parcel courier in Greece (more than 30% of the Greek market). ACS, a nationwide courier service, possesses extensive consolidation centres of varying sizes, along with a diverse fleet encompassing long-haul trucks, mid-range city trucks, light vans, and motorcycles. The distribution of orders throughout these consolidation centres occurs via fixed service paths within the service network. The final stage of the delivery process primarily involves home (or any other designated destination) deliveries and order pickups.

In this context, ACS, the primary logistics operator of Greece responsible for approximately 35% of urban deliveries, aims to adopt a Hub & Spoke delivery business model integrated with last-mile delivery services using advanced tools. The specific approach involves setting up micro-fulfilment centres on the outskirts of the historical centre, subjecting them to real operational testing. The objective is to increase load factors and reduce the number of vehicles, thereby enhancing operational planning efficiency and improving the overall customer experience.

Within the DISCO project, ACS will be the lockers' provider and will also test new services within the underused/unexploited areas of TIF Helexpo.

CITY AUTHORITY: The City of Thessaloniki is the main authoritative MEASURE ACCELERATOR that will enable and facilitate collaboration among stakeholders to work towards the integration of all the proposed interventions into the local SUMP. Through the DISCO initiative, Thessaloniki will have the opportunity to study, develop, and assess the operational impact of introducing parcel lockers to complement the existing delivery network. Meanwhile, for RCM (Region of Central Macedonia, Greece), the goals are multifaceted, including testing innovative last-mile delivery services and intelligent planning & monitoring tools. Establishing an ecosystem that supports the scalability and transferability of this approach will aid RCM in transitioning towards climate-neutral last-mile logistics and finalizing the Sustainable Urban Mobility Plan. The city of Thessaloniki is committed to facilitating the expansion and sustainability of the tested innovations. To achieve this, the municipality will actively provide the required political support and implement essential measures

to harness their potential and effectively adapt them to the specific challenges faced in the underdeveloped Sulp context. The City's ultimate goal is to ensure the DISCO innovations thrive and make a significant impact, fostering progress and development.

Further stakeholders to be involved:

At least one more **Logistics Service Provider** is going to be involved in the pilot to expand the potential and the transferability of the pilot's measures.

Real Estate companies are going to be involved in the pilot in an effort to populate and update the Logistics Real Estate Observatory that is going to be implemented in the context of DISCO. Real Estate companies are managing and/or owning vacant properties in the city. Hence, they can register their properties on the platform.

Major owners of warehouses and production sites that can provide their available underutilized spaces are going to be involved in short-term leasing, likewise to the concept of TIF Helexpo.

5) Technical Activities, Key Milestones and Timelines

The Gantt diagram for Thessaloniki's living lab showcases a comprehensive plan for the implementation of measures, divided into four distinct phases. The "Forerunner of Work" phase initiates the Living Lab's activities, gathering requirements and outlining the technical scope. In the "Pre-implementation Phase," specific activities take center stage encompassing the necessary licensing between the underused space provider and the LSP, procurement processes and the upgrade of the DISCO-Xs to fulfil requirements. As the project advances, the "Demonstration Phase" is engaged to showcase the functioning DISCO-X innovations to the stakeholders and Living Lab partners, obtaining valuable feedback and making necessary adjustments. Finally, the "Assessment Phase" comprehensively evaluates the implemented measures, analyzing performance, efficiency, and overall success against the predefined DISCO-X objectives. A detailed plan of actions and timeline is presented in Figure 12, as a GANTT chart for the demonstration project in Thessaliniki.

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Collaborative Business model elaboration	ALL	M1	M8																																																																																																																																																																																																																																																																																																																																																																																																
Signature of agreement between Partners	TIF, ACS	M1	M1																																																																																																																																																																																																																																																																																																																																																																																																
Alignment of ACS's operations and TIF's requirements (Specifications for the provided underused space)	TIF, ACS	M1	M4																																																																																																																																																																																																																																																																																																																																																																																																
Integration of ACS's operations into the new facilities (Proof of Concept)	TIF, ACS	M5	M8																																																																																																																																																																																																																																																																																																																																																																																																
Acceleration workshop with the Municipality & more partners to be found	CERTH	M7	M8																																																																																																																																																																																																																																																																																																																																																																																																
Assessment criteria - Local Workshop	CERTH	M7	M8																																																																																																																																																																																																																																																																																																																																																																																																
Agreement of Transition Path	CERTH	M7	M8																																																																																																																																																																																																																																																																																																																																																																																																
Pre-implementation phase				M9 M16																																																																																																																																																																																																																																																																																																																																																																																															
Expanding the tools of DISCO-X innovations (Physical and Digital infrastructure development for DISCO-X implementation) - Sensors procurement	CERTH	M9	M13																																																																																																																																																																																																																																																																																																																																																																																																
Upgrade DISCO-Xs to fulfill requirements	CERTH	M9	M16																																																																																																																																																																																																																																																																																																																																																																																																
Licensing and access regulations in TIF HELEXPO for ACS's operations	ALL	M9	M16																																																																																																																																																																																																																																																																																																																																																																																																
Data Space architecture alignment	CERTH, ACS	M13	M16																																																																																																																																																																																																																																																																																																																																																																																																
ACS workshop and internal alignment with the new operations in the provided TIF HELEXPO facilities	TIF, ACS	M15	M16																																																																																																																																																																																																																																																																																																																																																																																																
Launching Workshop	CERTH	M16	M16																																																																																																																																																																																																																																																																																																																																																																																																
Demonstration phase				M17 M24																																																																																																																																																																																																																																																																																																																																																																																															
Validation of Demonstration Scenario	CERTH	M17	M21																																																																																																																																																																																																																																																																																																																																																																																																
Setting up the architecture for the DISCO-X innovation applications site	CERTH	M17	M21																																																																																																																																																																																																																																																																																																																																																																																																
DISCO-X innovations value proposition	CERTH	M17	M21																																																																																																																																																																																																																																																																																																																																																																																																
Data Collection period for Evaluation	CERTH	M17	M24																																																																																																																																																																																																																																																																																																																																																																																																
Full implementation and testing	ALL	M17	M24																																																																																																																																																																																																																																																																																																																																																																																																
Involvement of additional stakeholders	CERTH	M20	M24																																																																																																																																																																																																																																																																																																																																																																																																
Assessment phase				M20 M28																																																																																																																																																																																																																																																																																																																																																																																															
PI Transition assessment	CERTH	M20	M24																																																																																																																																																																																																																																																																																																																																																																																																
Implementation of assessment methodology	CERTH	M20	M28																																																																																																																																																																																																																																																																																																																																																																																																
Proof of Concept Generalization	CERTH	M20	M28																																																																																																																																																																																																																																																																																																																																																																																																
Generalization scenario (for the Municipality of Thessaloniki area)	CERTH	M20	M28																																																																																																																																																																																																																																																																																																																																																																																																
Plan of measures for City Led Adoption of PI and DISCO-X innovations	CERTH	M25	M28																																																																																																																																																																																																																																																																																																																																																																																																
SUMP Alignment for SULP	CERTH	M25	M28																																																																																																																																																																																																																																																																																																																																																																																																

Figure 12 Annex. Gantt chart for Thessaloniki

6) Necessary aspects to consider for the implementation of the measures

Permits

All the **permits** to consider in terms of City Logistics regulations are mentioned in 3) Strategies Facts and Figures.

Available space

Urban space mapping is a continuous and dynamic process that will identify and assess available areas in Thessaloniki. The result will be a comprehensive database of underutilized and promising spaces.

7) Open days

The possibility of open days at Thessaloniki is still under consideration and it will be decided later with the project.

A large, faint, light blue graphic of a lightbulb with several short lines radiating from its top, suggesting an idea or innovation. The lightbulb's base is shaded in a light yellow-green color.

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