Deliverable 3.2: Trailblazer LLs: co-design activities,

implementation preparations, monitoring plan

WP3

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Abbreviations and Acronyms

ACRONYM	Description
ASG	Adaptive Speed Governance
BIGM(s)	Business innovation and governance model(s)
CINEA	European Climate, Infrastructure and Environment Executive Agency
DCM	Dynamic Curbside Management
EV	Electric Vehicle
F-LLs	Follower Living-Labs
GHG	Greenhouse gas emissions
OBU	Onboard Unit
SIEF	Standardized Impact Evaluation Framework
SUMP	Sustainable Urban Mobility Plan
T-LL(s)	Trailblazer Living Lab(s)
TMC	Tradable Mobility Credits
TUMS	Total Urban Mobility System
UC(s)	Use Case(s)
UKB	Urban Knowledge Base
WP	Work Package
ZESM	Zero-Emission Shared Mobility

Background: About the metaCCAZE project

Transport is the second largest source of greenhouse gas emissions (GHG) and accounts for more than 30% of the total energy consumption. A series of global crises highlight the need for a significant shift from conventional vehicles to well-integrated, energy efficient, connected and automated passenger and freight services that meet the ambitious EU goals. To do so, a paradigm shift is required in the operations of electric vehicles (EVs) that tackles their inherent vulnerabilities, including: the electric fleet-grid supply mismatch, the slow charging times, and the vehicle delays at charging stations. This requires automated charging processes, intelligent scheduling operations and matching to the grid, interconnectivity and automation of transport operations, and a shift from private cars to shared modes.

metaCCAZE is a Horizon Europe MISSION project co-funded by the 2Zero, CCAM-and Cities' Mission partnerships. It participates in the CIVITAS Initiative, an EU-funded programme working to make sustainable and smart mobility a reality for all and contributes to the goals of the EU Mission Climate-Neutral and Smart Cities.

The metaCCAZE project aims to revolutionise mobility in European cities, serving both passengers and freight, with innovative electric, automated, and connected solutions designed to make transportation smarter, net zero, and more efficient for all. It builds on the expertise of 44 partners from 12 different European countries and contributes to the green metamobility era that the Green Deal, 2ZERO, CCAM, Cities Mission, CIVITAS and other EU initiatives aim to reach by 2030. In the vibrant streets of four trailblazer cities – Amsterdam, Munich, Limassol, and Tampere – metaCCAZE implements, tests and demonstrates cutting-edge technologies and services that support shared zero emission mobility solutions for people and goods, contributing to climate neutrality. Successful technologies and activities are transferred and implemented to six Follower Cities – Athens, Krakow, Gozo, Milan, Miskolc, and Poissy, Paris.

metaCCAZE organises a series of metaDesign activities and develops a toolkit called metaInnovations. This toolkit is pioneered in passenger and freight services (public transport, on-demand minibuses, bike and scooter sharing, deliveries) and related infrastructure (mobility and logistics hubs, traffic management centres, charging infrastructure, transport and energy integration) and widely demonstrated in our four trailblazer cities for a whole year. Successful metaInnovations and metaServices are transferred, implemented and demonstrated in the 6 follower cities for up to 8 months, to ensure their transferability and resilience potentials.

Executive Summary

Deliverable 3.2 serves three key purposes within the metaCCAZE project. First, **it evaluates the co-design** (metaDesign) activities carried out in the Trailblazer Living Labs (T-LLs). This assessment focuses on how co-design formats facilitated collaboration among project partners, stakeholders, and citizens, ensuring that the developed Use Cases (UCs) and Business Innovation and Governance Models (BIGMs) reflect local needs and priorities. Participation levels, inclusivity, and the effectiveness of engagement strategies are reviewed to support future improvements. The evaluation demonstrates how the flexibility of co-design methodologies, supported by structured tools and guidance from metaCCAZE horizontal partners, enabled each T-LL to adapt to its local context and the evolving project phases. Co-design was not simply a participatory exercise but a strategic process that meaningfully shaped the UCs and their associated BIGMs, ensuring alignment with stakeholder and citizen needs.

Second, the deliverable **outlines the Implementation Plans for the four T-LLs**, detailing the administrative, legal, and technical preparations undertaken to enable real-world testing. It includes plans for the next project phases – Integration & Testing, and Wide-scale Demonstration. These plans aim to ensure that each T-LL is operationally ready to deploy innovative services, with a view toward later transferability to the Follower Living Labs (F-LLs).

Third, the document assesses **collaborative and cross-fertilization activities between T-LLs**. These efforts promote mutual learning, sharing of best practices, and collective problem-solving. The exchange of practices, tools, and insights has already contributed to problem-solving during early phases of the project. Going forward, targeted peer-to-peer exchanges and thematic deep-dives will be instrumental in addressing complex issues such as legal constraints, technological integration, and user adoption, thereby enhancing the overall impact and scalability of the project outcomes.

Overall, this deliverable supports progress monitoring and strategic planning for the implementation of UCs. While its primary audience includes internal project contributors, it also offers valuable lessons and practical approaches for external stakeholders, such as cities, research institutions, and mobility practitioners interested in co-design and real-world innovation deployment.

1. Introduction

This deliverable is the second in a series of three deliverables associated with Work Package (WP) 3. Building upon the first deliverable (D3.1 - Trailblazer LL management, communication and engagement handbook), which provided practical recommendations for establishing the Trailblazer Living Labs (T-LLs) and for organizing effective and inclusive co-design activities and communication strategies, Deliverable D3.2 is intended to support the metaCCAZE T-LLs in progressing to their subsequent stages.

The outputs presented in this deliverable are especially timely, as the four T-LLs (Amsterdam, Munich, Limassol, and Tampere) have recently concluded the initial phase of co-design activities and are now preparing to integrate metaInnovations with mobility and logistics services, as well as to demonstrate their Use Cases (UCs) at scale within their respective urban contexts. Specifically, the deliverable addresses the following project phases:

- MetaDesign & Preparatory Phase (M3 – M18): This preparatory phase involved the organization of all metaDesign (co-design) activities to collaboratively design the metaCCAZE mobility solutions with stakeholders and citizens. Additionally, it involved administrative, legal and operational processes to ensure readiness for testing and wide-scale demonstrations within the T-LLs. At the time of writing this deliverable, this phase is approaching its conclusion.
- Integration & Testing Period (M19 - M22): The purpose of this next phase is first, to integrate any metaInnovations (from WP2) within the UCs, and second, to test and ensure operational readiness for the wide-scale demos. Depending on the nature of each UC, this may involve testing and adjusting some technologies or doing small-scale tests involving citizens or other stakeholder groups.
- Wide-scale Demonstration Period (M23 - M34): This 12-month period involves wide-scale demonstration of the UCs and metaInnovations within the T-LLs. Within this period, only minor adjustments or expansions of the UCs will be made to enable a robust monitoring and evaluation process.

Drawing on insights from the four T-LLs, D3.2 provides a critical analysis of the achievements and challenges encountered in the first stage of the project, which is now concluding, while also outlining the next steps related to testing and real-world implementation.

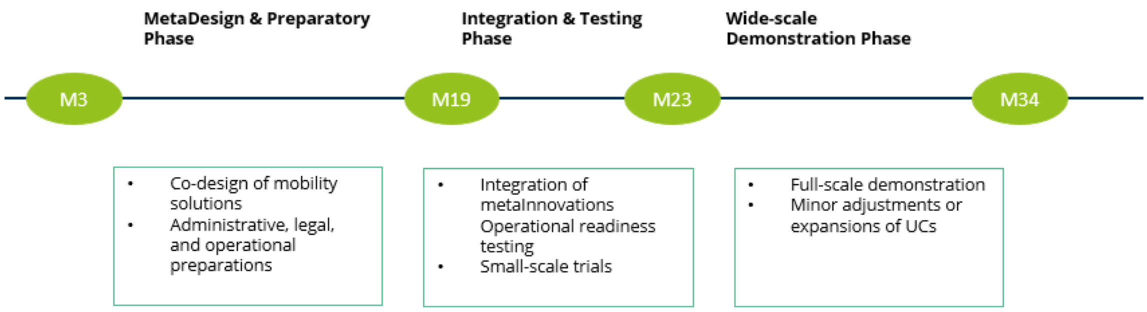


Figure 1: Key project phases for the metaCCAZE T-LLs

1.1. Objectives of the Deliverable

This deliverable has three main objectives. First, **it aims to assess the co-design activities** carried out within the T-LLs. Co-design – defined as metaDesign within this project – is essential to develop UCs and Business Innovation and Governance Models (BIGMs) that are responsive to the needs of stakeholders and the wider society. Building on the foundations of Deliverable 3.1 "Trailblazer LL management, communication and engagement handbook" and the established framework for metaDesign activities (LL1-LL5) and UC definition, this document offers a detailed assessment of the formats and activities that facilitated exchange between internal partners, external stakeholders, and citizens. It evaluates participation and user engagement within each T-LL to ensure that the developed UCs fit the needs of the population and align with the interests of affected residents. The formats are further assessed for their ability to reach an interested audience and local multipliers.

Second, **it presents the Implementation Plans for the four Living Labs**. This includes a review of the main administrative, legal tasks performed to set up the T-LLs and the services and technologies that will be tested. Moreover, it presents the plans for the next phases of the T-LLs, aiming to support the four trailblazer cities as they are preparing to integrate their metaInnovations with mobility and logistics services and to widely demonstrate them involving citizens and stakeholders. By performing a reality check on the status of each UC definition, the implementation plans highlight the latest status and adjustments that may need to be made during the implementation phases (in comparison to the UCs presented in Deliverable 1.4). Such an approach is crucial to consolidating and implementing the UCs developed in earlier project stages within WP1, before these UCs can be transferred to the Follower Living-Labs (F-LLs) within WP4. It is also critical to ensure that the T-LL leaders and their partners are ready to implement the UCs in the public domain, ensuring operational readiness of highly innovative services and technologies. Finally, it is necessary to monitor the progress within each T-LL.

Third, the document **reviews collaborative activities across the T-LLs, fostering cross-fertilization** and mutual learning among the participating cities. A detailed cross-fertilization framework is presented in Deliverable 1.2 entitled "Cross-fertilization and transferability framework and guidelines". This outlines all the activities carried out to achieve cross-fertilization; knowledge exchange between the T-LLs and the F-LLs. Activities within WP3 supplement cross-fertilization efforts among the T-LLs. The insights from these activities included in this deliverable will be used to provide recommendations for the wider cross-fertilization activities of metaCCAZEE.

The deliverable will be used to monitor the progress achieved within each T-LL and for each UC in terms of real-world implementation. Therefore, the primary audience of D3.2 includes its contributors, the WP3 leader, the T-LL leaders, supporters, and wider partners. Nevertheless, other individuals and organizations outside the project, such as cities or universities, may benefit from the lessons learnt included in this deliverable in terms of co-design as well as from the detailed information on how the T-LLs are approaching the preparation and implementation of innovative mobility solutions.

1.2. Structure of the Document

After presenting the general objectives and structure of the deliverable in Chapter 1, Chapter 2 begins with a comprehensive assessment of the metaDesign activities that were conducted. The focus here is on identifying the aspects that worked well, as well as the limitations and challenges of the participation and collaboration formats from the perspective of the T-LLs. The discussion in

Chapter 3 then shifts to future measures, presenting and evaluating detailed implementation plans for each UC. These plans include objectives, partners, key technologies, main risks, and corresponding mitigation actions. In addition, the Gantt charts in the Annex provide a precise, chronological breakdown of the various project phases. Chapter 4 examines the cross-fertilization formats, evaluating both their successes and the challenges encountered. The document concludes with final reflections and recommendations.

1.3. Relation to Project Documents

This document builds upon and lays the foundations for project documents developed within WP1 and WP3. A key reference for D3.2 is the Deliverable 3.1 "Trailblazer LL management, communication and engagement handbook", which provided a practical guide on T-LL management structures and processes, communication strategies and co-design. As noted in Chapter 2, this deliverable utilizes and critically reviews all the details (i.e. number and description of activities, stakeholders and citizens involved) around the metaDesign activities reported in Deliverable 1.1 "Trailblaser LLs: status quo map, prototype zero-emission shared mobility (ZESM) UCs for passengers and freight" and in Deliverable 1.4 "MetaDesigned ZESM UCs for the trailblazer LLs and the standardized impact evaluation framework (SIEF)". Deliverable 1.4 serves as a starting point for the development of the implementation plans included here. Specifically, the descriptions of the UCs within D1.4 were consulted to develop concrete plans to effectively reach the stages of integration & testing and wide-scale demonstrations. Moreover, the activities highlighted within Deliverable 1.2 "Cross-fertilization and transferability framework and guidelines" were considered in Chapter 3 which reviews the cross-fertilization efforts to date among the T-LLs. Finally, the content of this document lays the groundwork for the implementation of the UCs, and will be an essential resource for all metaCCAZE partners who need an overview of the plan for integration & testing as well as the wide-scale demos.

1.4. Overall Approach

The document was developed under Task 3.1, led by the WP3 leaders with contributions from T-LL leaders, supporters and other partners involved in the Amsterdam, Munich, Limassol and Tampere Living Labs. Each chapter required a different methodology. Chapter 2 was based on desk research and interviews with T-LL leaders, supporters or partners that were closely involved in metaDesign activities. For the development of Chapter 3, different resources were used. The beneficiary leading this deliverable as well as the communication and dissemination leaders developed templates and guidelines to help the T-LL partners develop their own implementation plans (Gantt Charts, scope and objectives for the testing & integration period, communication & dissemination Gantt Chart). Finally, Chapter 3 draws on the results of two rounds of questionnaires, discussions among the WP3 partners and observations during the regular WP3 meetings to understand successes and areas of improvement in terms of cross-fertilization among the T-LLs.

2. Assessment of metaDesign activities

Within the metaCCAZE project, special attention is given to co-designing mobility solutions in collaboration with internal project partners, external stakeholders and citizens. In contrast to top-down design approaches where one organization or consortium defines and designs the transport services and technologies they want to implement, bottom-up approaches emphasize continuous dialogue and debate among different stakeholders to co-design or rethink mobility services. Co-design can lead to a range of benefits for the organizations responsible for implementing a service, its future users and the wider society. It can help create better services and technologies, responsive to the needs of stakeholders and citizens. In the case of metaCCAZE, where highly innovative ideas are being rolled out, co-design has the potential to ensure that these innovations are socially accepted and supported by key stakeholders. Without such processes, the cities risk not identifying the needs of different stakeholders and citizen groups early on. As a result of this, the cities may experience low adoption rates and lack of long-term financial viability of the metaCCAZE services and technologies.

This chapter aims to provide an assessment of the metaDesign activities carried out by the T-LLs to co-design their UCs and BIGMs as well as their impact evaluation frameworks. The chapter analyses and builds upon information presented in Deliverable 1.1 "Trailblaser LLs - Status Quo map, prototype ZESM Use Cases for passengers and freight", and Deliverable 1.4 "MetaDesigned ZESM use cases for the trailblazer LLs and the SIEF", which present the methodology and outputs of the metaDesign activities conducted.

2.1. The metaDesign activities

The term "metaDesign" used in this project refers to the process and activities employed to co-design the mobility solutions that will be tested and demonstrated in the LLs. The metaDesign process started in the early phases of the project, in M4, with the main co-design activities concluded in M16. The metaDesign process was structured into a series of Living Lab (LL) activities to help the cities progressively advance towards the design of their UCs, BIGMs as well as their impact evaluation framework.

LL1: mini-dialogues

The mini dialogues aimed at discussing and specifying the needs of stakeholders involved in the TLL's sustainable urban mobility plan (SUMP). The activities helped the T-LLs gain an in-depth understanding of stakeholders´ real needs, the early barriers to adoption or acceptance, and their wider viewpoints in relation to the UCs.

LL2: metaDesign of UCs and BIGMs

The objective of this activity was to collaboratively refine and co-design prototype UCs and their BIGMs through local workshops. This ensured alignment with city-specific needs, stakeholder inputs, and contextual challenges, laying the groundwork for demonstration-ready solutions.

LL3: Maximising the uptake of metaServices

The LL3 activities aimed to enhance societal acceptance and potential user adoption of the proposed mobility solutions by collecting feedback on usability, attractiveness, and relevance. These sessions included citizens focus on identifying behavioural drivers, barriers, and engagement strategies for effective communication and social embracement.

LL4: Validation of UCs and BIGMs

The aim of the LL4 activities was to formally validate the refined UCs and BIGMs by confirming technical, operational, financial, and governance feasibility. This involves stakeholder alignment and final checks through consultations and local activities, ensuring readiness for the implementation phase.

LL5: Define the Key Performance Indicators and Impact Evaluation framework

The LL5 activities were organised to validate and refine the set of indicators developed as part of the SIEF. Each T-LL held a dedicated workshop involving stakeholders involved in the UC deployment, as well as actors responsible for monitoring exercises within the SUMP and the City Climate Contract Frameworks.

All the activities were organised by the T-LL leaders, supporters and partners. Guidelines for these activities were provided by partners involved in Work Package 1 (e.g. Bable, TRT, Ertico). The guidelines included templates to: a) structure the events to meet the objectives of the activities, and b) document the outputs of these activities. Additional recommendations on how to approach the co-design to engage with a diverse range of stakeholders and citizens were included in Deliverable 3.1 "Trailblazer LL management, communication and engagement handbook", (for example, guidance on stakeholder mapping, communication activities to advertise the metaDesign LL events, and practical recommendations to maximise the diversity of participants in the co-design process).

2.2. Assessment Methodology

The first step to define the assessment methodology was establishing the main evaluation criteria. To this end, the specificities of the metaCCAZE project and the metaDesign process were taken into account (i.e. the aims of this process) in addition to the principles presented in Deliverable 3.1. Based on this desk research, five assessment criteria were selected. Table 1 below illustrates the different criteria, the justification for their selection, and associated qualitative and quantitative indicators used for the assessment.

The evaluation of the co-design process presented here is primarily based on a qualitative analysis drawing on the outputs of the metaDesign activities (Deliverables 1.1 – Trailblaser LLs: status quo map, prototype ZESM use cases for passengers and freight and 1.4 - MetaDesigned ZESM use cases for the trailblazer LLs and the SIEF) and semi-structured interviews with the partners from the T-LLs mainly involved in the delivery of the metaDesign activities. Qualitative research methods in project or process evaluation can help assess what worked, what did not work, and why. In the following sections, we first present the themes emerging from the analysis of the interviews and the other qualitative information reported in past deliverables. We then present an assessment of the process based on the five criteria.

Table 1: Number of interviewees per each T-LL

T-LL	NUMBER OF PEOPLE INVOLVED IN THE SEMI-STRUCTURED INTERVIEWS
Amsterdam	1
Limassol	2
Munich	2
Tampere	3*

*Note: One of the Tampere participants provided feedback in written (over email).

Table 2: Co-design evaluation criteria

EVALUATION CRITERIA	JUSTIFICATION
Participation of a wide range of stakeholders	Including a wide range of stakeholders in the metaDesign process can help ensure good levels of acceptance of the final UCs. It can also help generate a wider range of ideas.
Participation of diverse groups of citizens	Including diverse groups in the metaDesign process can help ensure that the UCs meet the mobility needs of diverse population groups.
Use of various (digital and non-digital) communication channels to advertise the events	Using a range of digital and non-digital communication channels can help secure the participation of a large and diverse group of stakeholders & citizens.
Good level of participant engagement during the activities	Active participation of all participants during these activities (i.e. generating and sharing new ideas, providing feedback) is critical for an inclusive and high-quality co-design process.
Influence on final solutions (UCs & BIGMS)	The main aim of the metaDesign activities is to collaboratively design the UCs and BIGMS with stakeholders & citizens. The inputs in these activities should be taken into consideration in the design of the UCs and BIGMS.

2.3. Main Findings

Our analysis of interviews and other project documents identified three main themes describing the key successes and challenges of the metaDesign process: a) flexibility in co-design methods, b) successes and challenges in ensuring the participation of stakeholders and citizens, c) co-design perceived as essential for the development of innovative solutions.

Flexibility in co-design methods

To ensure consistency across activities and the various T-LLs, the partners from WP1 who led the relevant tasks provided guidelines and templates for the metaDesign activities to the T-LL partners. This ensured that all metaDesign activities were thoroughly documented. However, the specific methods and materials used for these activities were not prescribed—each T-LL had the flexibility to choose the most appropriate engagement method for each activity. The T-LL partners adopted a flexible, adaptive approach to co-design, tailoring methods to their evolving needs and stakeholder contexts throughout the metaDesign process. Rather than applying a one-size-fits-all model, teams selected methods and tools based on the input they required and the stage of their UC and BIGM development.

For instance, in Limassol, the team initially distributed an online questionnaire to parents of adolescents for the "On-demand mini-buses service" UC (LI-UC01). However, limited participation led them to pivot toward in-person focus groups with parents. The in-person focus groups proved more effective in enabling in-depth feedback from the participants who were able to discuss their experiences with the researchers and other parents. The Limassol T-LL team felt that this approach may prove beneficial in the long-term as these participants may be more engaged in later stages of the project, more likely to want their children to try out the new service and to share their feedback when they will experience the on-demand transport service. The team also commented that this preference for face-to-face interaction over digital tools may be related to the cultural context of Cyprus.

In the case of the Munich T-LL, the team began with workshops at the early stages of co-design, and later advanced towards the definition of their UCs and BIGMS through targeted group or one-to-one discussions, and site visits. This allowed them to identify and engage new stakeholders during the process (e.g. for the multimodal logistics hub, as they were exploring the feasibility and attractiveness of specific locations). Moreover, the fact that the team carried out interviews as part of the LL4 activities, helped them gain an in-depth understanding of different groups' requirements and needs. For example, while gathering input on dynamic curbside management (DCM), it became clear that some of the target groups (i.e. craftsmen) were interested in the reservation function, while others (i.e. courier express and delivery services) were mainly interested in the digital information due to the limited capacity to plan their journeys in advance.

One interviewee, when asked about the levels of engagement of different participants during the metaDesign sessions, explained that the fact that they had used a combination of engagement methods and techniques (i.e. group discussions, activities where participants were encouraged to share their personal views on boards) to gather feedback helped ensure that all voices are heard.

Successes and challenges in ensuring the participation of stakeholders and citizens

The T-LLs were **generally successful in engaging with stakeholders outside the project throughout all phases and activities of co-design**. Interviewees emphasized that the stakeholders who participated in these activities were highly interested in the project and aligned with its objectives. A wide variety of organizations took part in the metaDesign, including external public authorities (e.g. national governments, public transport authorities, electricity authorities), private sector organizations and affiliated individuals (e.g. transport planners and consultants, representatives of logistics companies, real estate firms, tourist agencies, shop and restaurant owners, professional drivers), and third-sector organizations such as cycling advocacy groups. The T-LLs' success in stakeholder engagement was likely **enhanced by early efforts to identify and map key stakeholders to be involved in the co-design**. For instance, T-LLs were tasked with such activities during a WP1/WP3 session at the metaCCAZE "Kick-off meeting". They also submitted lists of targeted stakeholders as part of their status quo mapping. One interviewee noted that co-design should ideally begin with a discussion and alignment on shared values, the key challenges of the cities, and the desired vision—before moving on to the design of specific UCs.

The T-LL partners interviewed reported that while they were **generally satisfied with feedback received from lay citizens, they faced challenges in securing participation from diverse citizen groups.** In many cases, limited citizen engagement was due to the fact that certain UCs did not focus on passenger travel (e.g. logistics or freight transport). Interviewees also noted that they made efforts to engage citizens who would be directly affected by the UCs, which required **tailored engagement strategies for each use case.**

All interviewees agreed that time constraints and a lack of immediate relevance of some UCs to citizens' current concerns were key factors limiting participation. Strategies that proved effective in encouraging citizen involvement in metaDesign included:

- **Involving as a partner in the consortium or engaging organisations with expertise in citizen engagement:** Some of the T-LLs mentioned that the fact that internal or external partners had close ties with citizen groups and experience organizing engagement or consultation activities enabled them to achieve greater participation of citizens.
- **Organizing activities in accessible locations where citizens were already present for other purposes** (e.g., workplaces, schools, public spaces, and local events), which made participation more convenient. For example, the Amsterdam T-LL organized an outdoors workshop as part of its LL2 and LL3 workshops at the Marineterrein, a vibrant area, home to the City of Amsterdam's Innovation team and the AMS Institute. Citizens who passed by were able to participate in the activities, providing useful comments on the local UCs and BIGMS.
- **Using insights from previous research or engagement projects:** To supplement the insights gained through the citizen engagement activities, the T-LL supporters looked into evidence from previous research they or others had carried out involving citizens. For example, the Tampere supporters drew on and built upon evidence gathered through surveys conducted in the context of a previous project.

For the activity LL3, the T-LLs were instructed to include professionals in their activities with the role of normal citizens, encouraging them to share their insights based on their everyday mobility needs and aspirations as citizens working and living in these cities. Although this is a supportive strategy to consider citizen needs, it should not be seen as a replacement of citizen engagement. Experts may not be aware of the needs of specific groups, particularly of marginalised groups that may experience significant transport and social disadvantages.

Co-design perceived as essential for the development of innovative solutions

The documents examined in this evaluation, along with interviews conducted with T-LL partners, highlight the critical role of co-design in shaping innovative UCs and BIGMs. The synthesis of findings from the metaDesign activities reported in Deliverables 1.1 and 1.4 demonstrates how each phase of metaDesign contributed to a deeper understanding of citizens' and stakeholders' needs, concerns, potential barriers to acceptance and adoption, and to a more refined design of the UCs and BIGMs. When prompted, interviewees were quick to identify examples of how conversations with citizens and stakeholders directly influenced the final design of the UCs and BIGMs. As a result, the **metaDesign activities were seen as an effective mechanism for leveraging the collective knowledge and expertise of various individuals and organisations**. The examples that follow illustrate the value of co-design in developing more acceptable and effective UCs and BIGMs:

- The pricing strategies for three of Limassol´s UCs were developed through the metaDesign activities focused on co-designing the BIGMs with stakeholders.
- In Amsterdam, the insights shared by nautical managers and other experts from sailing departments were essential to design the interaction between users and technologies in the relevant UC. They also helped the T-LL partners understand that complex approvals are required from multiple regulatory bodies.

- The findings from a survey with citizens in Tampere highlighted that local residents want real-time updates and better accessibility in autonomous shuttle services.
- In Munich, a key conclusion of the first metaDesign activities focused on the multimodal logistics hub UC was that the logistics stakeholders preferred a single large hub over several smaller hubs. Thus, the team adapted their plan which initially included a network of smaller hubs distributed across an area.

In addition to the themes identified through the analysis, Table 3 highlights the findings in relation to the abovementioned criteria.

Table 3: Findings of the co-design assessment

EVALUATION CRITERIA	FINDINGS
Participation of a wide range of stakeholders	√ Engagement of stakeholders from a wide range of organisations (public, private, third sectors)
Participation of diverse groups of citizens	Challenges were encountered in securing the participation of large numbers/ diverse groups of citizens √ Strategies to encourage greater citizen engagement were implemented
Use of various (digital and non-digital) communication channels to advertise the events	√ The T-LLs used digital (i.e. social media, direct emails, online groups) and non-digital (i.e. posters) media
Good level of participant engagement during the activities	√ Good level of engagement of all participants achieved through suitable techniques during group activities and smaller group or 1-2-1 interviews
Influence on final solutions (UCs & BIGMS)	√ Demonstratable influence of co-design on final solutions

2.4. Conclusions & Recommendations

Across T-LLs, participants highlighted the value of maintaining **methodological flexibility** and adapting formats to fit both the project's phase and the local context. **Structured support**—such as templates and workshop guidelines provided by horizontal partners—was instrumental in documenting outcomes and ensuring consistency across the T-LLs. Successful engagement hinged not on doing co-design for its own sake, but on applying it meaningfully where it could generate tangible value.

The T-LLs **effectively engaged a broad range of internal and external stakeholders across co-design phases**, thanks in part to early stakeholder mapping and alignment efforts. **Despite generally positive feedback from citizens, teams faced challenges in securing participation from diverse groups,** particularly when UCs did not directly concern passenger transport. Tailored strategies were required to engage citizens most impacted by each UC. Factors such as time constraints and perceived irrelevance of certain topics limited broader citizen involvement. Successful engagement strategies included organizing activities in accessible, everyday locations, encouraging professionals to share perspectives as citizens, and leveraging previous research to enrich current engagement efforts.

The evaluation highlights co-design as a key driver in the development of innovative and effective UCs and BIGMs. Lessons learnt presented in previous project Deliverables and insights from the interviews confirm that each phase of the metaDesign process enhanced the understanding of stakeholders´ and citizens' needs and informed the refinement of the final outputs. Overall, co-design was seen as a powerful approach for integrating diverse perspectives, identifying potential barriers, and ensuring greater relevance and acceptance of the proposed solutions.

Based on the lessons learnt from this evaluation, recommendations for other initiatives that may involve co-design of mobility solutions include:

- **Maintain Methodological Flexibility:** Co-design formats and methods should be adaptable to the project's phase and local context to remain relevant and effective.
- **Use Structured Support Tools:** Templates, workshop guidelines, and other structured supports help ensure consistency and thorough documentation across teams while still allowing local adaptation.
- **Conduct Early Stakeholder Mapping:** Early identification and alignment of stakeholders help lay the foundation for effective engagement throughout the co-design process.
- **Tailor Engagement to the Target Audience:** Strategies should be customized to reach the specific citizen groups most affected by the mobility solution under development, especially when the UC is not universally relevant.
- **Address Participation Barriers:** Co-design activities should take into consideration factors like time constraints and perceived relevance when planning engagement efforts.
- **Leverage Existing Knowledge:** The organization of data collection activities and the analysis of their outputs can draw on previous research and past engagement, saving time and enhancing depth.
- **Use Co-Design to Refine and Validate Solutions:** Co-design should not be seen as a standalone activity. Rather, it needs to be embedded as a continuous process to develop acceptable, equitable and sustainable mobility solutions.

3. Implementation Plans

This Chapter presents the detailed Implementation Plans for the metaCCAZE T-LLs. It does so by looking at the main actions that were completed to prepare the T-LLs for the testing and wide-scale demonstrations, as well as the tasks that need to be completed before and during the wide-scale demonstrations in the four T-LL cities. In this way, the Implementation Plans include actions that are taking place during the three phases of this project; the metaDesign & Preparatory period, the Integration & Testing period, and the Wide-scale Demonstration period.

Each of the next sections begins with a recap of each T-LL and the UCs that will be integrated with meta-Innovations and tested in real-world conditions. A full description of the UCs, including their scope, objectives, and associated technologies and infrastructures, as well as the developed BIGMS can be found in Deliverable 1.4. "MetaDesigned ZESM use cases for the trailblazer LLs and the SIEF". Following this recap, the implementation plans for each T-LL and UC are presented, summarizing the main activities for each project phase. Emphasis is given to the upcoming phases of integration & testing and wide-scale demonstrations.

Detailed Gantt Chart can be found in the Appendix. The Gantt Charts aim to provide a comprehensive list of tasks and milestones that are completed before and during the testing and integration phase, as well as the wide-scale demonstration phase. The Gantt charts were first prepared by the T-LL leaders, supporters and other partners in early Autumn of 2024 (M9 of the project), while the T-LLs were working closely with WP1 partners to define their UCs and BIGMS. At this early stage, the aim was to visualize all the steps and actions required to organize the demos. The WP leaders reviewed all Gantt Charts and requested revisions to ensure that these include the necessary level of detail in preparation of the tests and wide-scale demos. The Gantt Charts were stored as "live documents" and were last updated in May 2025 (M17 of the project) to present the finalized plans in preparation of this deliverable. The testing & integration plans were first developed in May 2025, after the definition of the UCs (in Deliverable 1.4) and the completion of the metaDesign (co-design) activities.

The final section of this chapter focuses on local communication strategies, highlighting how the cities involved - supported by the project's communication and dissemination leaders (Steinbeis) - have developed their respective plans. Detailed communication plans for each T-LL and UC are provided in the Annex.

3.1. Amsterdam T-LL

The city of Amsterdam is piloting smart and sustainable mobility and logistics solutions that protect the city´s heritage and address its need to reduce CO_2 emissions and improve road safety. The following UCs highlight diverse but interconnected approaches - from waterborne logistics and e-bike accident avoidance to waste collection and mobility credit systems.

3.1.1. AM-UC01 - Autonomous electric waterborne vessels for logistics

In the first UC autonomous electric vessels are being explored as a solution to improve urban freight logistics and overall traffic safety. Utilising the city's waterways helps shift freight transport from trucks and vans to autonomous, electric waterborne transport improving road safety for vulnerable users and the safety of waterborne vessels through supporting skippers with autonomous features. A major co-benefit is the reduction of pressure on Amsterdam's historic road infrastructure. Another motivation for this UC is the shortage of ship captains within the maritime sector. This UC and future implementations of autonomous vessels will reduce reliance on manual labour while maintaining safe and efficient operations. Electric vessels are already operating within Amsterdam. These vessels will be equipped with autonomous technology features to greatly improve safety and enable far-reaching levels of autonomous sailing. Key challenges for this UC include the development of new hardware features, ensuring safe autonomous navigation, particularly in the event of system failures, and regulatory challenges. The legal framework for this UC is still under development, with changes potentially happening during the project lifecycle. As of the time of writing, fully autonomous sailing is permitted through exemption requests for the areas where operation is intended. A skipper must remain onboard to intervene if necessary. Recent national policy changes allow far-reaching autonomous sailing under specific conditions. The City of Amsterdam's local government is still reviewing its policy in light of these national developments. The city remains responsible and liable for these operations. The plan is to test autonomous sailing features initially (during the testing & integration phase) in restricted areas and later expand operations to the wider city centre of Amsterdam (involving a skipper in some areas as required by local regulations). In terms of physical and digital infrastructure, the UC requires:

- A ZoevCity electric waterborne barge vessel
- Sensors, cameras, Lidar, GPS, 5G, Electronics
- Software for continuous interpretation of the incoming sensory/camera data and communication to the back-end systems of Roboat (the subcontractor responsible for developing the autonomous infrastructure, hardware and software)

3.1.1.1. metaDesign & Preparatory Phase

During the first phase of the project, in addition to the metaDesign activities, the main preparatory activities for this UC involved:

- **Assessment of legal and regulatory status of autonomous sailing in Amsterdam:** The regulatory framework around autonomous sailing in Amsterdam (and the wider Netherlands) is still evolving. Through the co-design and other engagement activities, the city assessed the legal status of autonomous sailing, including the areas where autonomous sailing is or is not permitted, the permits required for autonomous sailing and other requirements.
- **Subcontracting of a company that will enable the operation of autonomous features:** ZoevCity, an Amsterdam T-LL partner owning and operating electric waterborne barge vessels for logistics services, subcontracted Roboat, a company providing hardware, software and sensor systems to enable autonomous sailing operations.

3.1.1.2. Integration & Testing and Wide-scale Demonstration Phases

Table 4: Implementation Plan - AM-UC01 - Autonomous electric waterborne vessels for logistics

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Test the autonomous sailing capabilities of the vessel with Roboat (sensors, software, AI). • Validate operational capacity (navigation, communication with control centre, safety).	• Reduce greenhouse gas emissions and other pollutants associated with traditional diesel-powered vessels. • Streamline logistics operations by optimizing routes, reducing human error, and minimizing operational

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• Before the autonomous system can operate reliably, the entire environment along the intended route must be digitally mapped. This involves creating a high-resolution 3D map of the operational area, including static elements like quays, bridges, and infrastructure, as well as dynamic factors such as typical traffic patterns and potential obstacles. • Engage (public) stakeholders in discussions around the legal possibilities for demonstration/implementation along the route in Amsterdam.	costs associated with manual piloting and maintenance. • Alleviate congestion in busy waterways and ports, and improve traffic management. • Demonstrate a commitment to sustainable transport solutions and promoting innovation within the maritime industry. • Address the unique challenges of navigating congested urban waterways and integrate sustainable transportation solutions into densely populated areas.
Technologies, infrastructure & services	• Electric waterborne barge vessel (x1) with autonomous navigation technologies. • Hardware components including: Azimuth thruster, bowthruster, user interface, sensors, cameras, LiDAR, GPS, 5G modules. • Software for interpreting sensory input and controlling vessel movement. • Control centre operations for remote monitoring and intervention.	
Location	Marineterrein (Roboat), Havenkolom F (ZoevCity), along the testing route in Amsterdam (around NIeuwmarkt).	

Risks & Challenges	• Sensory data misinterpreted
	  ○ Mitigation action: Use of redundant sensors and real-world AI training
	• Communication failure
	  ○ Mitigation action: Stable communication protocols and fallback safe-stop mode
	• Engine breakdown
	  ○ Mitigation action: Preventive maintenance and manual override procedures
	• Software glitches
		Same as in the integration & testing phase, in addition to:
		• Complex interface for interference and lack of trust in the system
		  ○ Mitigation action: Intuitive UI/UX design. Conduct user training and onboarding sessions. Feedback loops and system updates based on user input to build trust.
		• Limited space for legal operation of autonomous features
		  ○ Mitigation action: Stakeholder steering group

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	○ Mitigation action: Redundant systems and remote intervention ● Navigation system failure ○ Mitigation action: Backup methods and manual control fallback ● Legal restrictions ○ Mitigation action: Stakeholder steering group to advocate for regulation updates	to advocate for regulation updates
Participants & Engagement	● Zoev City (2 persons) ○ Technical / organisational / operational ● Roboat (4 persons) ○ Technical / operational ○ Subcontracted – involved in testing and operation ● Municipality of Amsterdam (4 persons) ○ Legal ● Boat Skipper (1 person) ○ Operational ○ Involved in testing and operation ● AMS Institute (2 persons) ○ Operational support ○ Support – involved in supporting the design, coordination and reporting of the pilot	Same types of participants, roles and responsibilities as in the testing & integration phase. The wide-scale demonstration will involve **actual operations of logistics services** to meet the pilot´s objectives.
Timeline	M16 - M20, possibly extended to M23	M21 - M32

3.1.2. AM-UC02 - Adaptive Speed Governance

Amsterdam is testing Adaptive Speed Governance (ASG) for connected e-bikes. The aim is to improve traffic safety in urban environments. This technology enables real-time adaptability of vehicle speeds based on contextual data - such as location, time, and events - allowing cities to adjust speed limits in certain areas. The test area is the Vondelpark - one of Amsterdam's biggest and busiest parks, a monumental park located near several major traffic arteries of the city, where pedestrian security became an increasingly important issue in recent years.

By enabling location-aware, time-sensitive speed management, the project aims to prevent accidents and support smoother coexistence between active mobility users and other road users. Successful implementation depends on a reliable connected infrastructure and user compliance. Challenges especially include ensuring data security and managing user privacy.

This UC does not require any modifications of physical infrastructure, but needs the development and use of the following assets:

- Total Urban Mobilty System (TUMS) intended for Area and Asset Managers. This is a digital infrastructure that contains the outputs of Place-Based Safety Studies and Narrative Records (Interviews with key stakeholders).
- Infrastructure-connected bicycles and eBikes (physical). The plan is to provide units to at least six users.
- A dedicated Onboard Unit (OBU) connected to a 5G network, communicating with TUMS, initially scoped for 6 units. The device displays place-based traffic cues and nudges, obtained by TUMS.
- An Urban Knowledge Base (UKB) to record the knowledge captured while conducting the place-based safety studies (digital).

3.1.2.1. metaDesign & Preparatory Phase

In the first phase the Amsterdam T-LL focused on the **delivery of extensive co-design activities**, primarily narrative record interviews, qualitative research interviews, with the Volderpark manager (pilot area/ park manager), e-bike riders, cyclists associations and volunteers of the park. Additionally, Townmaking – the partner holding the main responsibility for setting up the UC and necessary digital infrastructure – has **carried out a place-based safety study**, feeding into the UKB and the Total Urban Mobility System. The place-based safety study is repeated every three months in the project lifecycle to ensure that the most up-to-date information is reflected in the digital infrastructure supporting the UC. Finally, **important milestones that were achieved during this period include the development of the reference bicycle** (infrastructure-connected bikes and e-bikes, including the dedicated OBU, **and the system configuration** (ensuring that all systems function together). The system and the reference bicycle will be updated during the upcoming phases, embedding the lessons learnt from testing and demonstrating the UC.

3.1.2.2. Integration & Testing and Wide-scale Demonstration Phases

Table 5: Implementation Plan - AM-UC02 - Adaptive Speed Governance

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	The primary objective is to test place and context-based information cues with cyclists to assess behavioral impact.	1. Preserve Vondelpark's heritage as a pedestrian-friendly public space. 2. Address high cycling speeds, especially among commuters and delivery riders on eBikes.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	The tests need to ensure timely, integral, and relevant information is provided to cyclists on the Connected Bicycles consisting of an onboard device (Wayflow Device) mounted on reference bicycles connected to a real-time environment to provide place-based safety information.	3. Implement speed control measures without altering the park's infrastructure. 4. Use Adaptive Speed Governance technology to govern cycling speeds and enhance safety. 5. Promote harmonious coexistence between cyclists and pedestrians in the park. 6. Promote a collaborative approach, working together with multiple bodies within the Municipality and city.
Technologies, infrastructure & services	• Knowledge Base (Place-based information) • Total Urban • TUMS • Wayflow Environment / Device (x6 or more) • Test Rig • Reference bicycle	Same as in the integration & testing period. During this phase, the reference bicycle and the whole system are updated based on the outcomes of the monitoring and evaluation.
Location	Vondelpark, Amsterdam	

Risks & Challenges	• Timely delivery of Safety Information to Onboard Device
	  ○ Mitigation action: Configured 5G network for timely delivery of context-based information, Predictive caching strategies, fallback experiences for outages
	• Connectivity non-availability (network connectivity is temporarily unavailable
	  ○ Mitigation action: Configured network for high availability low data throughput, fallback experiences
	• Lack of situational coverage, the risk of poor situational coverage is that incidents occur for unconsidered situations. For example, by only considering sunny day scenarios and omitting stormy or poor weather conditions, the risks of specific weather-based risks are not introduced into the safety modelling and cyclist experiences.
	Mitigation action: Comprehensive Place-based safety studies and Narrative Records to avoid "trial and error" culture. For an explanation of Narrative Records, see: https://www.townmaking.com/search/cls-urban-knowledge-bases/cnt-why-narrative-records ; For examples of narrative records, see https://narratives.townmaking.com/	

Participants & Engagement	Testing will involve at least: Organized citizens (>2) and their members • Area managers (>1)	Same as in previous phase.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• Asset managers (park (asset) managers) (>1) • Cyclists (>6) , through partnering with the organisations above. Along with: • Townmaking Institute Technology, infrastructure and service development and operation / (eco)system engineering / coordination / reporting • City of Amsterdam Partner, support, coordination, operation • AMS Institute Support in EU coordination and reporting	The **final number of participants - cyclists remains unknown**, as it will depend on the needs identified by the various stakeholders. The Townmaking Institute ultimately seeks the implementation of OBUs as a regulated Vignette issued by a local or national authority in the Netherlands, realized either as an independent device mounted on the vehicles, or integrated into the vehicle’s onboard cockpit experience.
Timeline	M19 - M22, possibly extended to M23.	M23 - M34

3.1.3. AM-UC03 - Multimodal waste collection system

In the third UC, Amsterdam is developing a multimodal waste collection system that combines waste collection methods with electric cargo bikes, light electric vehicles and ships. The aim is to reduce the impact of heavy-duty vehicles, decrease litter and protect historic infrastructure and vulnerable road users in dense urban areas. By supplementing an on-demand waste collection that uses cargo bikes, light electric vehicles, and barges with scheduled services, the number of heavy vehicles needed can be significantly reduced, while improving the service for the neighborhood. This approach requires advanced coordination tools, as lighter vehicles must make more frequent trips. To optimize route planning and scheduling, TU Delft is developing a prototype algorithm. A digital twin of the relevant area - provided by the partner Argaleo – supports the analysis. The algorithm will be tested in the De 9 Straatjes neighborhood in Amsterdam’s city centre, an area where the on-demand multimodal waste collection service is already being piloted.

3.1.3.1. metaDesign & Preparatory Phase

Beyond the metaDesign activities, the Amsterdam T-LL partner, TU Delft, gathered the data required for the algorithm, designed the parameters of the pilot and developed the algorithm for the optimization of the scheduled waste collection. The proof-of-concept model will be ready in M19.

3.1.3.2. Integration & Testing and Wide-scale Demonstration Phases

Table 6: Implementation Plan - AM-UC03 - Multimodal waste collection system

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Develop a prototype optimization algorithm to maximize the efficiency of a scheduled waste collection service in the city center of Amsterdam. • Test the algorithm to ensure operational readiness.	1. Maximize efficiency of the new waste collection system 2. Increase customer satisfaction 3. Decrease illegal waste disposal 4. Decrease litter, caused by damaged waste bags on the streets. 5. Reduce the weight load on historic infrastructure 6. Improve traffic safety in the historic inner city 7. Reduce emissions by modal shift to light electric vehicles
Technologies, infrastructure & services	**MetaInnovation:** Optimization algorithm for multimodal waste collection logistics. A prototype scheduling and routing algorithm will be developed to optimize the scheduled waste collection service. The output of the algorithm is an optimized schedule and travel plan. The software will run on a personal computer. No physical infrastructure modification is needed.	
Location	A computational study will be conducted to test the prototype algorithm.	De 9 Straatjes area, Amsterdam (the location may change after M24)
Risks & Challenges	The prototype algorithm will produce a new schedule and travel plan, which will be reviewed by the service operator and his team (municipality of Amsterdam) for feasibility before implementation. As a result, the associated risks are minimal.	

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN

Participants & Engagement	• TU Delft (2 persons)
	  ○ Technical / design / organisational / operational
	  ○ Lead partner for the pilot – involved in the design, coordination, operation and reporting of the pilot
	  ○ Execution of the computational study
	• City of Amsterdam (>1 person)
	  ○ Organisation / co-design / operation
	  ○ Communication and dissemination, operation
	  ○ Operational validation of the outcome (by city's planners)
	• AMS Institute (>1 person)
	  ○ Operational support / co-design
	  ○ Support – involved in supporting the design, coordination and reporting of the pilot
	• Argaleo
	  ○ Support / design
	  ○ Involved in data analysis, pattern recognition, generating and visualising insights.
		In addition to the participants in the integration & testing period:
		• Users (Residents & local businesses)
		  ○ Bring the waste to one of the collection points at specific times

Timeline	M19 - M21	M22 – M34

3.1.4. AM-UC04 - Tradable Mobility Credit scheme

A new Tradable Mobility Credits (TMC) scheme is being piloted to motivate responsible travel behaviour. Using a digital platform, employees from one or more organisations in and around Amsterdam receive a predefined amount of mobility credits based on their mobility needs and can exchange these credits with a common pool. Different modes of transport have varying credit prices, primarily based on their environmental and spatial impact, whereby more sustainable travel choices are encouraged through price differentiation. This enables flexible and personalised mobility while keeping overall mobility impact within environmental and spatial limits.

This UC explores how market-based instruments can promote more sustainable urban travel patterns. The chances and challenges of TMC- models are first tested in multiple local organizations where employees are allocated a number of credits based on their needs. The service is provided by two tech companies Technolution (operator of market system and responsible for the conversion of travel data to credit spending) and Fynch (tracks mobility activities) in cooperation with the TU Delft who provides the credit allocation algorithm.

3.1.4.1. metaDesign & Preparatory Phase

In addition to the metaDesign activities, during phase 1 the Amsterdam T-LL mainly focused on the following preparatory activities:

- **Securing partnership with Fynch**, an external to the consortium company that will be providing the platform for trip checking tracking. Technolution has partnered with Fynch to integrate its platform with the credit balance and virtual market.
- **Engaging companies that could take part in the pilot:** This activity is still in progress and it is expected that it will be concluded in phase 2.
- **Developing the algorithm for optimally allocating credits** to distinct population segments within an urban environment to promote the adoption of sustainable transportation modes.

3.1.4.2. Integration & Testing and Wide-scale Demonstration Phases

Table 7: Implementation Plan - AM-UC04 - Tradable Mobility Credit (TMC) scheme

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Ensure that the separate systems can work independently of each other. • Validate that the integration of the systems results in the envisioned functionality.	1. Make travelers aware of alternative modes of traveling, namely for the commuter trips. 2. Promote sustainable and multimodal transportation choices. 3. Test effectiveness of TMCs on a diverse participant pool (income, home location, gender diversity). 4. Encourage active, light, and electric transport usage over motorized options, namely the usage of private cars. 5. Foster shared mobility usage (shared mobility and/or carpooling) for full trips and/or first/last mile public transport.

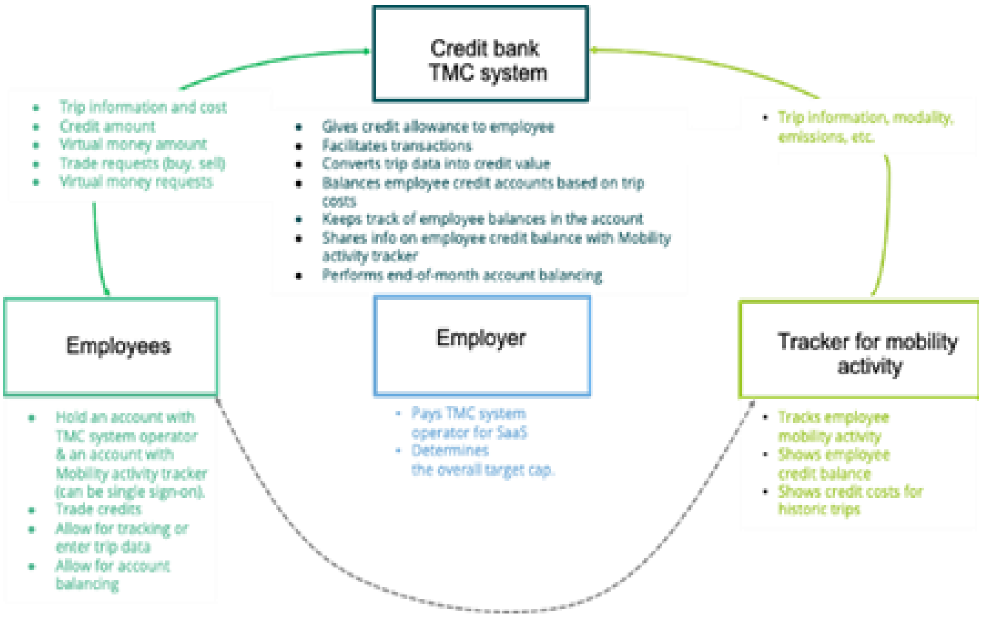
<table>
<tr><th></th><th>INTEGRATION & TESTING PLAN</th><th>WIDE-SCALE DEMONSTRATION PLAN</th></tr>
<tr><td>Technologies, infrastructure & services</td><td colspan="2">The two main technologies are:

• Credit bank TMC system

Testing will focus on the data ingestion with the Tracker, on the data processing based on the TU Delft algorithms for credit valorisation, on front-end app where employees can see and trade credits, on the back-end system that integrates all data flows all together and on the integration of the entire chain of the solution.

• Tracker for mobility activity

Testing will focus on the multi-modal behaviour internal participants will show and how this data gets ingested into the Credit bank TMC system.


</td></tr>
<tr><td>Location</td><td>Internal testing (testing with internal T-LL partners as end-users).</td><td>The location of the testing and its area of influence will depend on the partner organizations and the employees that will participate in the experiment. The partner organizations have not been determined, yet, therefore, the location will be defined in phase 2.</td></tr>
<tr><td>Risks & Challenges</td><td>• Tracking App does not provide the detailed trip information needed for credit valorization.
    ○ Mitigation action: early check of interfaces to exchange the correct data needed for the</td><td>In addition to those faced in the previous phase:

• Low Public Acceptance
    ○ Mitigation action: Engaging multiple organizations to invite them to this</td></tr>
</table>

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	algorithms AND using an App for an existing provider experienced in these challenges. • The algorithms for credit valorization cannot process the received trip and credit information due to inconsistency in data formats. ○ Mitigation action: early check of API and data formats including size of messages, frequency of messages, etc. • The front-end shows invalid information and/or information from another user. ○ Mitigation action: user authentication and cyber security checks are in place before the tests can start. • The number of trades, trips, etc. exceed the back-end's computing dimensions resulting in an unresponsive system. ○ Mitigation action: the test starts with a limited user set to test the back-end's timing requirements and a scale up to dimension the back end correctly.	activity. Training participants at the start so that they understand the reasoning behind the system and pricing principles.
Participants & Engagement	• TU Delft ○ Technical / organizational / operational ○ Lead partner for the pilot – involved in the design, coordination, operation and reporting of the pilot ○ Testers • Technolution (1 person) ○ Technical / organizational / operational ○ Operation of the marketplace	• Employees from Amsterdam-based company or companies (targeting min. 80 employees, final number depending on user acceptance) ○ End-users for the demonstration phase

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	○ Testers ● City of Amsterdam (>1 person) ○ Organization / operational ○ Communication and dissemination, ethical validation ○ Testers ● Fynch (>1 person) ○ Technical / operational ○ Operation of the mobility tracker ○ Testers ● AMS Institute (>1 person) ○ Operational support ○ Support – involved in supporting the design, coordination and reporting of the pilot ○ Testers	
Timeline	M18 to M23	M24 to M34

3.2. Limassol T-LL

The city of Limassol is piloting a coordinated set of mobility- and energy-related UCs primarily aimed at reducing the city's dependence on private cars and promoting more sustainable transport alternatives. Private cars are currently the dominant mode of transport in the city, while the existing public transport network struggles to compete in terms of coverage and comfort. Together with several partners Limassol leverages digital technologies, AI, and integrated infrastructure to enhance flexible, sustainable, and efficient public mobility options for its residents.

3.2.1. LI-UC01 - On-demand mini-buses service

This UC is based on the efforts to launch an on-demand electric minibus service aimed at reducing private car use and improving mobility options for specific user groups. To address this, MaaSLab and the Municipality of Limassol in collaboration with partners such as EMEL are developing digital, dynamic public bus services that can flexibly respond to demand, rather than operating on fixed routes. The long-term goal is to shift travel habits and generate operational data that can contribute to improvements to the transit system. The first phase of the service focuses on teenage students commuting to extracurricular activities. Once established, after the demonstration period of this project, the service is expected to expand to tourists and employees of selected companies. AI-based algorithms will match supply and demand in real time, optimizing routes and reducing waiting times.

3.2.1.1. metaDesign & Preparatory Phase

During the first phase, the Limassol T-LL partners **organised several co-design sessions and defined the operational parameters of this service** (i.e. numbers of vehicles required, operational area, initial schedules). Moreover, MaasLab – the partner responsible for the technology supporting the service – **developed the on-demand service platform** (for citizens and drivers). At the time of drafting this deliverable, the team is integrating the **platform to the public transport operator´s vehicle management system**.

3.2.1.2. Integration & Testing and Wide-scale Demonstration Phases

Table 8: Implementation Plan - LI-UC01 - On-demand mini-buses service

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	Objectives of the testing phase: • Evaluate how well the platform handles dynamic scheduling and real-time route optimization. • Assess protocols for student safety, including driver vetting, real-time tracking, and parent notifications. • Gather feedback from students, parents, and schools on usability, convenience, and trust in the system. • Test integration with existing systems (e.g., school schedules, attendance systems, public transport).	• Design and offer a reliable shared mobility service that can compete with the convenience of private vehicles. • Design marketing and awareness campaigns to start changing the car-oriented culture in the city and promote a shift from private cars to the shared mobility service. • Improve traffic flows (especially during the afternoon-evening pick hours when parents escort their children to their after-school activities) • Increase the modal split of shared and public transport modes. • Reduce air pollutants to achieve the goals of Climate city's contract. • Improve the well-being of citizens and especially families (that may also have disabled kids). • Achieve operational efficiency: e.g., dispatch, routing, vehicle tracking.
Technologies, infrastructure & services	MetaInnovations that will be tested in UC01: • AI recommendation and incentivisation engine (ST2.1.2) • Supply-demand matching algorithms (ST2.6.4)	In addition to the technologies and infrastructures used in phase 2, private vans and taxis may be used if needed, depending on service demand. These vehicles will be used if the service with nine mini-buses proves to be

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• Integrate and Plan: Digital Twin Platform for Optimization (T2.7) The recommendation engine will provide users with suggestions on whether to use public fixed-route services or other available transport modes before or after using the on-demand service. While the service operates on an on-demand basis, there may be instances where it cannot accommodate the user's exact pick-up or drop-off location. In such cases, the engine will offer alternative transport recommendations to ensure a complete and seamless journey. Infrastructures that will be tested: • The mixed fleet of mini-buses (estimating to use 2-4 mini-buses in this phase) Other technologies that will be tested are the followings: • A mobile application for citizens to pre-book trips • A mobile application for the bus-drivers to navigate them to the pick-up locations • A web-based system, where the bus companies register their fleet and their drivers, monitor which buses are assigned to drivers & where the buses and drivers are in real-time, do bus scheduling, monitor the kms of the	insufficient. Therefore, the timeline for the relevant milestones is set for a date after the service will have been running for a reasonable period. In this phase, the operational hours and zones may be expanded, as required.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	buses and hours of operation. In the test phase, the service will work with volunteer students and will operate as it would in the normal phase. Parents have already registered their children for after-school activities, through the focus groups that have been conducted, and route optimisation is currently ongoing. Professional drivers will be provided by EMEL, our local partner. This way, the platform, the applications, the mini-buses, the data collected in the Digital Twin Platform, and the incentivization engine will all be tested. Through this test, we plan to gather feedback from real users in a real-world environment to identify bugs, enhance the user experience, and validate that the WeeDrive platform meets users' needs before its full implementation. Finally, a framework has been scheduled to guide the testing phase of the service: • Accept only activities, not bookings, up to a certain date. • Limit bookings for specific hours of the day: The limit will be defined by the Transport team.	
Location	The test will take place in the metropolitan area of Limassol, transporting students to their after-school activities.	
Risks & Challenges	• User Acceptance: ○ Mitigation actions: Successful Marketing campaign; Citizens survey and focus groups to determine needs that will be addressed through the Use Case; Accessibility and inclusivity	

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN

	• Problems using the app or navigating the interface
	  ○ Mitigation actions: Training tutorials for professional drivers; Training tutorials online for parents and students; Provide clear instructions for guardians, students, and schools to minimize operational errors
	• Scheduling Issues and availability of mini-buses or drivers:
	  ○ Mitigation actions: EMEL will always have standby professional drivers and mini-buses available to replace those with issues.	

Participants & Engagement	Profile of participants: • Parents with students from 12 to 18 years old • Students from 12 to 18 years old • Mobility providers – EMEL will provide mini - buses • Professional drivers that will participate in the service The number of people involved in the testing phase is estimated at approximately 100 students who will test the service. In addition, around 100 parents are expected to register their children, along with 2 to 3 professional drivers. During the testing phase, it is estimated that 2 to 4 mini-buses will be used.	The service will be gradually extended to users. In the initial phase, it will be opened to 100 users, and later it will expand to 150 users. The target is to reach 250 users per day once the service is fully operational and available to the general public
Timeline	M18 - M21	M22 – M34

3.2.2. LI-UC02 - Shared e-bikes

In the second UC, the introduction of a station-based shared e-bike system by Nextbike complements Limassol's growing portfolio of alternative mobility solutions. Strategically placed docking stations across the city will support both bike sharing and e-bike charging, encouraging active, low-emission mobility. The service includes smart features such as GPS tracking and a mobile app showing real-time availability. AI-based tools will support efficient fleet distribution based on demand data, which will be stored for further analysis and service optimization. While the project helps reduce car dependency, challenges remain in ensuring broad coverage, user adoption, and balancing supply with fluctuating demand.

3.2.2.1. metaDesign & Preparatory Phase

In the first phase of the project, the Limassol T-LL purchased the vehicles required for the operation of the shared mobility service. Additionally, through co-design activities and local workshops, the partners (NextBike, City of Limassol, and MaaSLab) defined the locations for the docks. The e-bikes have been in operation since Month 13 of this project (January 2025). Therefore, in this case the two project phases have been integrated and the wide-scale demonstration started in M13.

3.2.2.2. Integration & Testing and Wide-scale Demonstration Phases

Table 9: Implementation Plan - LI-UC02 - Shared e-bikes

<table>
<tr><th></th><th>INTEGRATION & TESTING PLAN</th><th>WIDE-SCALE DEMONSTRATION PLAN</th></tr>
<tr><td>Objectives & Scope</td><td colspan="2">• Decrease car usage
• Reduce air pollution by promoting active transportation options
• Encourage a healthier lifestyle by choosing active modes of travel within the city
• Promote sustainable urban mobility by encouraging cycling
• Encourage citizens to be more active through cycling
• Improve real-time data sharing to optimize services.
• Reduce car traffic in central areas
• Integrate cycling with public transportation, allowing e-bikes to be parked and used for public transport, and vice versa.
• Incorporate smart technologies into sustainable transportation strategies.
This service will not have a testing phase, as it has already been operating with conventional bikes. Through the metaCCAZE project, e-bikes have been integrated into the existing system, using the same application.</td></tr>
<tr><td>Technologies, infrastructure & services</td><td colspan="2">Digital infrastructure: Existing app (NextBike) is used

Physical infrastructure: 50 e-bikes</td></tr>
<tr><td>Location</td><td colspan="2">Metropolitan area of Limassol with several stations placed in strategic places to

be easily accessible to all Limassol residents.</td></tr>
<tr><td>Risks & Challenges</td><td colspan="2">• Real time data (e.g., bike location or availability) is not updated correctly
    ○ Mitigation actions: Use reliable cloud hosting services with high uptime guarantees
    ○ Set up redundant servers and automatic failover system
    ○ The app is already developed and all of these have been integrated
• Bikes are shown as available in the app but are physically not present or already rented.
    ○ Mitigation actions: Implement real-time inventory tracking and notify users of nearby alternatives.</td></tr>
<tr><td>Participants & Engagement</td><td colspan="2">The service is already being used by citizens.</td></tr>
</table>

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Timeline	M13 – M34 The e-bikes have been in operation since Month 13 – January 2025 of the project. Before the start of this project, NextBike, the local partner responsible for the bike-sharing service, has already deployed conventional bicycles. The shared e-bikes operate through the same application and utilise the same digital infrastructure as the conventional bikes. The service is already collecting data, and NextBike has access to this information, which is currently being used to evaluate the performance and process of the shared e-bike system.	

3.2.3. LI-UC03 - Multimodal passenger hub

Building on previous experience from the first UCs, Limassol is creating a multimodal Mobility Hub in a strategic position close to the city centre. The aim is to integrate and enable seamless transfers between buses, bicycles, and park & ride services. The hub is designed with digital features, such as real-time information systems and electric vehicle charging infrastructure, alongside physical amenities like bike parking and e-bike docking.

By concentrating services in one accessible location, the hub aims to improve user experience and support modal shift towards more sustainable options like cycling and public transport. While the Municipality of Limassol is in charge of the project, key partners like Nextbike or the public transport authority (EMEL) ensure the construction and operation of bus and bike infrastructure on the site. Key challenges include managing multimodal coordination and ensuring citizen´s acceptance.

3.2.3.1. metaDesign & Preparatory Phase

In addition to the co-design activities to define the UC and the related BIGM, the T-LL partners carried out a public procurement for the architectural design of the space. They also initiated the processes to secure an agreement between the Ministry of Transport and GASYO (the owner of the Land). In the remaining months before the start of the wide-scale demo, this agreement will have been finalized and a building permit will have been secured.

3.2.3.2. Integration & Testing and Wide-scale Demonstration Phases

Due to the extensive construction works required for this UC, the demo is expected to start in M26 of the project.

Table 10: Implementation Plan - LI-UC03 - Multimodal passenger hub

	INTEGRATION & TESTING PLAN WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	● Promote the use of public transport and micromobility solutions to reduce congestion ● Provide transportation options that are accessible to a diverse range of users ● Lower carbon emissions through sustainable transport choices ● Develop strategies to increase the micro-mobility modal split ● Encourage a shift from individual motorization to safer, more efficient, and environmentally friendly transport modes ● Improve interconnectivity between public transport, walking, and cycling ● Ensure system interoperability between different transport modes (e.g., buses, bikes, scooters) ● Collect feedback from users (commuters, students, drivers) on usability and convenience ● Test incentives for modal shift from private cars to sustainable modes ● Identify bottlenecks in passenger flow, vehicle loading/unloading, and transitions between modes
Technologies, infrastructure & services	● Test the integration of digital tools, such as route planning apps, ticketing systems, and real-time tracking, Smart bus shelters with real-time displays ● WeeDrive Platform (LI-UC 01) ● Application NextBike (LI-UC 02) ● Energy and Transport Platform (LI-UC 04) ● Digital Twin Platform (T2.7) ● Ease of use switching modes The physical infrastructure used in this UC includes parking spaces for private cars, buses, bikes and scooters, parking spaces for shared vehicles and taxis, EV charging stations, covered waiting areas, restrooms for professional drivers, green spaces, security equipment among others.
Location	The location is the Tsireio stadium in Limassol. t is located close to highway, and it is close to a central entrance of the city. There is sufficient space to create a parking station, electric urban bus station and to create space for canteens, parcel collection and public toilets. This space has direct access to the bus lanes and cycle paths proposed in the SUMP.
Risks & Challenges	● Citizen' s acceptance: ○ Mitigation actions: Implement a successful marketing campaign; Make parking facilities free for a certain time
Participants & Engagement	Participants profile: The participants will represent a diverse group relevant to the real-world use of the multimodal hub: ● Citizens

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• Mobility Providers: Professional drivers and the local operator (EMEL) who will manage the mini-buses. • Municipality Staff: Potential involvement from local government for oversight, technical monitoring, and evaluation of the pilot results. Public transport passengers can be invited and encouraged to participate in the testing phase, for example NextBike users who rent e-bikes. These invitations can be sent through the NextBike app, and EMEL users can be informed along the routes they use, especially if those routes may include the multimodal passenger hub.	
Timeline	The test for this service will take place on M26 –February 2026 because as an infrastructure-based project, it requires substantial construction works and preliminary studies, agreements and permissions to be prepared and approved by local and national authorities.	

3.2.4. LI-UC04 - Transport and energy platform

In the fourth UC several partners are cooperating with MaaSLab to develop an integrated Internet of Things platform in Limassol to align transportation, electric vehicle charging, and energy grid management. The system led by MaaSLab and the Electricity Authority of Cyprus aims to guide users towards energy-efficient charging behavior - such as using off-peak hours and prioritizing renewable energy sources.

Data from multiple sources, including V2I (Vehicle-to-Infrastructure), smart bus stops, and traffic counters, will be consolidated to support real-time and predictive decision-making. The solution is expected to benefit city planners, EV users, as well as the energy authority.

3.2.4.1. metaDesign & Preparatory Phase

The preparatory phase for this UC included the following main tasks:

- **Identification and collection of relevant datasets** (i.e. from the national electricity authority): This required agreements between the Ministry of Transport and the Electricity Authority.
- **Development of platform and underlying digital infrastructure** (i.e. interfaces for data visualization and analytics).

3.2.4.2. Integration & Testing and Wide-scale Demonstration Phases

Table 11: Implementation Plan - LI-UC04 - Transport and Energy Platform

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Evaluate how well the platform handles real-time and static dataset extraction, transformation and loading (ETL) at scale.	• Reduce air pollution • Optimize charging grid increasing use during non-peak grid hours or when renewable energy sources power the grid

	• Assess protocols for stakeholder privacy & security, including Role-Based Access Control (RBAC) and Login notifications. • Gather feedback from stakeholders on usability, convenience, and trust in the platform. • Test integration with existing systems (e.g., Data Warehouse, Recommendation Engine, API connectors). • Design and offer a reliable platform that ingests real-time and static data from Energy and Transport sector and provides recommendations that contribute to reduced CO_2 emissions • Design marketing and awareness campaigns to make potential stakeholders (EV fleet operators, private EV owners) aware of the platform. • Recommend time-of-day for charging EVs, both to EV fleet operators, as well as private EV owners to achieve reduced load on the power grid, increased cost savings to stakeholders and increased use of power when Renewable Energy Sources contribution to the Electricity mix is highest.	• Decrease the high car modal share (91.8%) by enhancing public transport appeal • Incorporate smart technologies in sustainable transportation strategies • Reduce noise pollution
Technologies, infrastructure & services	MetaInnovations that will be tested in UC04: • AI recommendation and incentivisation engine (ST2.1.2) • Data Warehouse (ST2.2.1) • API Connectors (T2.2.2) Infrastructures that will be tested: • Setups will be in the cloud (Microsoft Azure) Specific technologies that will be tested: • An AI-based recommendation engine A Data Warehouse comprising of Data Lakes and Databases	

Location	Testing will take place in Limassol	

Risks & Challenges	• API connectors are not operating properly
	  ○ Mitigation actions: Use reliable cloud hosting services with high uptime guarantees; Set up redundant servers and automatic failover system
	• Datasets are not available or updated to the prescribed frequency
	  ○ Mitigation actions: Send notifications through the platform to dataset owners and request for action; Find alternate dataset owners	

Participants & Engagement	In the test phase, the platform will work with: • EMEL, Limassol T-LL partner • A few volunteers/ private EV owners This way, the platform, the data collected and the recommendation engine will all be tested. The goal is to evaluate whether the engine can provide effective recommendations for managing the triangle of grid, fleet, and demand. Through this test, we plan to gather feedback from real users in a real-world environment to identify bugs, enhance the user experience, and validate that the platform meets users' needs before its full implementation.	The participants will represent a diverse group relevant to the real-world use platform: • Private EV owners • Mobility Providers: The local operator (EMEL) who will manage the EV fleet, private fleet operators.
Timeline	M18 – M22	M23 – M34

3.3. Munich T-LL

Munich is rethinking urban logistics by piloting innovative solutions for last-mile delivery and dynamic curbside use. The city is exploring how digital infrastructure, multimodal hubs, and semi-automated vehicles like electric rickshaws (as a demonstrator) can reduce congestion, optimize space, and lower emissions in dense urban areas.

3.3.1. MU-UC01 - Dynamic Curbside Management

In the first UC, Munich is developing a dynamic curbside management system that digitally maps and monitors curbside use in real time. This allows for more efficient sharing of space among logistics providers, ride-hailing services, taxis, public utilities, and local vendors. A key demonstration feature of this pilot is the use of a (semi-)automated electric rickshaw for last-mile transport, demonstrating how such vehicles can interact with digitally managed curbside. This demonstration case is applied in a separate, non-public testing facility of the Technical University of Munich. Within this use case, a two-step approach is applied: piloting at the local level and assessing scalability across the wider city network within a modelling approach. The implementation during the wide-scale demonstration period in different districts of the city will enable users to receive real-time information about curbside availability in the selected zones. Introducing a reservation function of the selected zones proves to be rather difficult due to national traffic legislation, and will therefore be only discussed as a future option at this stage.

3.3.1.1. metaDesign & Preparatory Phase

The initial steps towards the implementation of this UC included:

- Identification of potential users and integration of their requirements in the UC design
- Selection of the parking zones
- Development of the application and underlying technologies

3.3.1.2. Integration & Testing and Wide-scale Demonstration Phases

Table 12: Implementation Plan - MU-UC01 – Dynamic Curbside Management

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	Main objectives: • Install and test sensors in all selected delivery zones. • Monitor parking behaviour and acceptance of sensors with selected users. • Test and roll-out app/ API with different user groups. Before wide-scale implementation, it is necessary to test that: • Sensors are in place and working. • User interface and operability of the app/ API interface. • Information about UC distributed to different user groups.	• Reduce road congestion. • Reduction of the time/distance searching for a parking spot (for delivery companies). • Mitigate transport visual impact (reduce illegal double-lane parking). • Reduce GHG and pollutant emissions. • Increase urban environmental liveability (quality of public space).
Technologies, infrastructure & services	The following elements will be tested during the integration and testing period: • Real-time monitoring dashboard that displays occupancy of the DCM zones (Smart Curbside Space Parking System) • Dedicated smartphone app and API to communicate occupancy to users and, discussing the reservation of DCM zones	

<table>
<tr>
<td></td>
<td colspan="2">
The metaInnovations refer to the “network-level dimension” of the use case: This focuses on investigating how to scale the concept to larger areas and exploring its systemic effects.
In terms of physical infrastructure, 20 zones have been selected (equipped with more than 70 sensors in total). Each zone consists of a minimum of 2 parking spaces (each space is approximately 6-8m long by 2 m wide). A requirement from the stakeholder workshop stated that each space can host vehicles of up to 12 tons. Each DCM zone has specific markings and signage to highlight its special use.
</td>
</tr>
<tr>
<td>Location</td>
<td colspan="2">The selected loading zones which are to be equipped with sensors and real-time information made available via app/ API are located in the “Altstadt” (old town of Munich) and in an adjacent city district.</td>
</tr>
<tr>
<td>Risks & Challenges</td>
<td colspan="2">

Current German Road traffic legislation and limited ability regarding implementation of reservation function
Mitigation actions: Implementation in different stages to ensure real-time availability and dynamic management; reservation option possibly only tested in few selected locations.
Acceptance of user groups due to differing requirements and routing and stopping patterns
Mitigation actions: Differing user group needs are incorporated by implementation in stages and collecting feedback and aligning requirements accordingly; close monitoring and exchange with partners, possible agile alignment of software solutions
Sufficient commitment by different user groups and handling of illegal parking,
Mitigation actions: Integration of user groups in workshops and interview to gather and assess requirements and feedback; establishment of continuous feedback loops during demonstration phase
Some of the zone might be blocked due to construction works on e.g. buildings next to the zones which may the restrict the zones availability for deliveries for a particular time period
Mitigation action: since a high amount of delivery zones is equipped with sensors for the duration of the project, the availability of a selection of zones for user groups is ensured.

</td>
</tr>
<tr>
<td>Participants & Engagement</td>
<td>The testing and integration phase will require the involvement of selected individual users from the different stakeholder groups. These individual users will be approached in order to test the real-time information function for those zones already equipped with sensors.</td>
<td>After the testing and integration phase, the applications are made available to all users within the different stakeholder groups such as logistics companies, hotel and restaurant deliveries, taxi companies, representatives of</td>
</tr>
</table>

	No incentives are needed, as only commercial stakeholders are involved (no regular citizens).	small shops, craftsmen or the municipality.
Timeline	M18 – M22	M23 - M34

3.3.2. MU-UC02 - Establishment and operation of multimodal logistics hubs

In Munich, multimodal logistics hubs are being developed to shift last-mile deliveries from trucks and vans to more sustainable vehicles such as cargo bikes. This UC explores how a large multimodal logistics hub can integrate several logistics partners, including traditional services, delivering parcels mainly to private households, as well as innovative freight services by heavy-duty freight bikes. The hub aims to reduce congestion, reduce motorized road freight vehicle activity, and cut emissions. The UC will also include the testing of semi-autonomous rickshaws for deliveries in non-public areas. The location of the multimodal logistics hub has been confirmed and preparations are in place to start operations. Space permitting, the UC will integrate related services, such as battery swapping and repair services, as well as an exhibition space to demonstrate the bicycles used for the services.

3.3.2.1. metaDesign & Preparatory Phase

Some of the most important tasks carried out by the Munich T-LL include:

- **Procurement of logistics bikes for the demo.**
- **Selection of the Hub location:** This included negotiating a feasible, potential location for the implementation of this UC, the final decision has been made and the selected location is prepared for operation. The plan is to implement one logistics hub instead of several smaller hubs. All locations have been assessed based on various regulations and users´ requirements.
- **Engagement with potential tenants of the space:** A large hub will require a sufficient number of committed logistics partners for cost-effective operation.

3.3.2.2. Integration & Testing and Wide-scale Demonstration Phases

Table 13: Implementation Plan - MU-UC02 - Establishment and operation of multimodal logistics hubs

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	Main objectives: • Finalize the infrastructure and equipment for the Multimodal Logistics hub. • Begin and consolidate operations by the logistics companies. • Resolve any potential early issues, and ensure necessary coordination between all stakeholders operating in the hub. Before wide-scale demonstration, it is necessary to test that: • The fleet of vehicles used by each logistics company can successfully operate in the hub. • All necessary facilities and physical requirements are provided (sufficient space and infrastructure for charging bikes, space for storing parcels, repair areas, loading bays, etc.).	• Reduce road congestion. • Reduce motorized road freight vehicle activity. • Reduce the standing time of motorized vehicles in the public space. • Reduce climate and pollution impact. • Increase urban environmental livability. • Increase operators' acceptance of implemented measures. • Make parcel delivery more economical.
Technologies, infrastructure & services	The following elements will be tested during the integration and testing period: • e-cargo bikes (from B4B) • charging infrastructure • common facilities for the logistics companies (resting areas, bathrooms, etc.) • operational strategies of each logistics operator This UC does not involve any metaInnovation.	
Location	In the Multimodal logistics hub (exact location still under negotiation)	
Risks & Challenges	• The vehicles intended to be used by the logistics companies are not suitable for the logistics hub (due to their size, maximum slope, etc.).	

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	○ Mitigation actions: We have partially mitigated this, as the cargo bikes from B4B were already tested in the facility under negotiation. The other logistics companies are aware of the facility's characteristics and should choose their fleets accordingly. ● Additional services, facilities, infrastructure, or space are needed. ○ Mitigation actions: The municipality will closely monitor the initial operation of the hub to detect emerging needs as soon as possible. The municipality and the logistics companies will collaborate to find solutions to these needs. ● There is a lack of coordination between the logistics companies, leading to conflicts in the use of the common space. ○ Mitigation actions: The municipality has already implemented a previous logistics hub (Viehhof) and has gathered best practices on how to coordinate the different companies and facilitate collaboration. There will likely be some challenges initially, but we expect them to be resolved over time.	
Participants & Engagement	The testing and integration phase will require the involvement of the logistics companies (both management and delivery staff), the municipality, the owner of the facility, service providers, etc. No incentives are needed, as only commercial stakeholders are involved (no regular citizens).	
Timeline	The testing is planned to begin as soon as the rental agreement for the logistics hub is signed and the first companies start to operate from it (June 2025). We expect that the testing phase will be shorter than scheduled in the GA, as companies will likely prefer to consolidate their operations as soon as possible.	

3.4. Tampere T-LL

Tampere is exploring how autonomous electric shuttles can support and expand its public transport network. With a focus on safe operations, remote control, and wireless charging, the city aims to improve first- and last-mile connections while collecting insights for future integration and service development.

3.4.1. TA-UC01 - Autonomous e-shuttles with advanced remote-control center and inductive changing

Tampere is piloting fully autonomous electric shuttles (without safety operators onboard) supported by a central Remote-Control Center, aiming to integrate them into the city's public transport system. The focus is on ensuring safety through advanced situational awareness tools and real-time integration with traffic data and signals. The autonomous shuttles will use inductive charging and operate on routes equipped with precision positioning and dedicated audio-visual infrastructure. Passenger experience and regulatory compliance are also key evaluation areas in this pilot. At the time of writing this document, the route of the service is still being defined. Nevertheless, the T-LL partners have already decided that the targeted location in Hervanta in Tampere, a large suburb in a distance of about 10 kilometers from the city center, and an area with a diverse mix of residents.

3.4.1.1. metaDesign & Preparatory Phase

Some of the most important tasks carried out by the Tampere T-LL include:

- **Tender process to procure the vehicles:** The team initiated a tender to select both the vehicle provider and the specific vehicles for the pilots. The final selection process is still ongoing.
- **Route planning and definition of area: T**he team has been defining the operational area and routes in collaboration with external stakeholders. This work considers Tampere's existing infrastructure, requirements for automated charging, and the capabilities of potential vehicle providers.
- **Design of the automated charging & remote operations systems:** Research has been completed to support the development of related meta-innovations.

3.4.1.2. Integration & Testing and Wide-scale Demonstration Phases

Table 14: Implementation Plan - TA-UC01 – Autonomous e-shutlles with advanced remote-control center

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Ensure the remote-control systems operate consistently and effectively under typical and outlier scenarios. • Ensure seamless communication and coordination between autonomous vehicles and the Remote-Control Centre (RCC): Test the data exchange between vehicles and the RCC to guarantee minimal latency and high reliability. • Confirm that the vehicles can access and interact with the charging systems as designed. • Confirm readiness of city-managed infrastructure: Evaluate whether curbside modifications, bus stops, and other infrastructure meet the operational requirements. • Evaluate the ability of remote operators to monitor and intervene in vehicle operations when needed: Assess how	• Increase public transport / tram passenger usage in pilot areas. • Reduce car dependency in pilot areas. • Ensure actual and perceived safety of the piloted system. Evaluate cost-effectiveness of the pilot solutions. • Ensure the working functionality of the autonomous charging and remote operation center supporting the pilots

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	effectively operators can take control or make decisions remotely in critical situations. • Assess the scalability of the RCC in managing multiple vehicles concurrently: Determine the RCC's capacity to oversee several vehicles at once without compromising safety or performance. • Detect potential vulnerabilities in the system and address them through iterative testing and improvements. • Gather citizen feedback to guide system design and deployment. • Reduce need for fast operator response: Make sure that critical safety features work on their own without needing quick help from a remote operator. • Check for security risks and build the system to protect against hacks or data breaches. Aspects of the UC that needs to be tested. • System response time and latency between vehicles and the RCC. • Effectiveness of emergency intervention procedures by remote operators. • Reliability of connectivity and communication under varied environmental and traffic conditions. • Interoperability between vehicle systems, ROC, and charging infrastructure. • Compliance with safety regulations and city infrastructure requirements. • Operator interface usability	

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Technologies, infrastructure & services	- Remote Operations Technology: Testing of remote vehicle control systems, including interfaces, command-response systems, and intervention protocols. - Vehicle Autonomy Systems: Validation of autonomous navigation, obstacle detection, and safety decision-making using AI and sensors. - Communication Infrastructure: Assessment of network stability, latency, and bandwidth between vehicles and the Remote Operations Centre. - Charging Solutions: Testing the integration and operation of inductive charging solutions. - City Infrastructure Readiness: Evaluation of curb modifications, bus stop configurations, and signage to support AV operations. MetaInnovations Remote Control Centre - RCC - The RCC will be used to supervise and support automated vehicles in real time, without an onboard safety operator. - Operators will monitor live data feeds, camera views, and system alerts to oversee vehicle performance and safety. - Intervention scenarios will be tested where remote operators must take control in critical or unexpected situations. - The system will be evaluated for responsiveness, communication latency, scalability (monitoring multiple vehicles), and operator interface usability.	
Location	Tampere area – Lintuhytt	
Risks & Challenges	- Connectivity Disruptions: Unstable or lost connection between the autonomous vehicle and the Remote Operations Center. - Mitigation action: Test connections from different mobile connection vendors. Ensure continuation of safe operation if/when the connection fails. - Delayed Remote Intervention: Slow response time from operators during unexpected events. - Mitigation action: Ensure that the operator doesn't need to do timely interactions with the vehicle, i.e. all the safety critical functionalities are done locally. - Cybersecurity Vulnerabilities: Unauthorized access or data breaches affecting vehicles or operations center. - Mitigation action: Do a cyber security audit and ensure that the system is safe by design. - Inadequate Infrastructure Compatibility: Existing urban infrastructure may not fully support AV deployment needs. - Mitigation action: Take the environmental factors into account when choosing the demonstration route.	

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• Scalability Constraints: Operational limitations when managing multiple vehicles from a single RCC. ○ Mitigation action: Ensure sufficient technology maturity. • Public Trust and Safety Perception: Resistance or concern from the public regarding driverless vehicles. • Mitigation action: Inform publicly about the trials and demonstrations.	
Participants & Engagement	Testing will be applied mostly to technology. Fifty people will be invited to participate. Participants will be residents of the surrounding area, and the users of the tram service. People with disabilities will be directly invited. Additionally, the trial may be opened to a limited number of general audience.	The service will be available to use for all citizens.
Timeline	M19 – M22	M23 – M32

3.4.2. TA-UC02 - Tram feeder service with advanced remote-control centre and inductive charging

Building on the technologies used in the first UC, this pilot connects autonomous shuttles to the tram network to extend its catchment area. The goal is to improve first- and last-mile connectivity, particularly in underserved zones, while collecting data to assess usability and service efficiency. The shuttles will rely on the same Remote-Control Centre and inductive charging setup.

The two UC in Tampere are similar in terms of technology, differing in the routes. Both pilots face challenges related to multimodal coordination, public trust in automation, and long-term scalability within the public transit system. Nevertheless, they offer a valuable opportunity to test and refine cutting-edge mobility solutions that could shape the future of transport.

Due to the similarity of the UCs the implementation plans for TA-UC01 apply in the case of TA-UC02 too. The definition of the pilot area for UC02 is still pending.

3.5. Local communication and marketing strategies

By M14, the four T-LLs had developed the first versions of their respective local communication and marketing strategies. At this stage of the project, local communication and marketing activities are intended to:

- Engage stakeholders and citizens to facilitate the co-design of user-centred solutions, raise awareness, and build trust.
- Advertise the initial successes of the T-LLs and demonstrate the future impact of the tested zero-emission shared mobility solutions.

- Prepare for a high level of uptake of the metaServices, foster community ownership, and encourage sustainable behavioral change.

These strategies are living documents that will be refined and updated as the UCs are further defined, designed, tested, and demonstrated.

3.5.1. Basis for local communication strategies based on local needs and context

Building upon the project's overarching communication strategy (i.e., D5.1., corporate identity, target audiences, key messages, and channels), each T-LL identified, in their local communication strategies, the channels, slogans, and punchlines that best resonate with local stakeholders. For example, each T-LL brainstormed slogans and punchlines to be used in communication materials to promote the uptake of the future metaServices (Figure 2).

Amsterdam	Equitable access within planetary/urban/ecological/spatial boundaries. From pilots to progress: collective efforts in shaping a smart, sustainable transport ecosystem
Limassol	Μαζί για Έξυπνες, Μηδενικών Εκπομπών Μετακινήσεις Επενδύουμε σε Έξυπνη και Πράσινη Κινητικότητα για την Πόλη μας WeeDrive Chill travel on cool buses
Munich	Smart vernetzt, nachhaltig bewegt Geteilter, digitaler öffentlicher Raum und innovative urbane Logistik für München
Tampere	Driving Innovation, Wirelessly – Tampere's Next-Gen Transit. Beyond the Wheel – Shaping the Future of Urban Travel in Tampere. Tech Meets Transit Kato äiti, ilman kuskia

Figure 2: Selection of initial slogans/punchlines in T-LL

Each T-LL also identified the most effective channels for reaching local stakeholders. Most living lab partners already operate their own websites and social media platforms with established audiences. As such, most cities chose to leverage these existing channels (e.g., Facebook, Instagram, LinkedIn) rather than creating new ones. Some cities are also exploring collaborations with local tech bloggers and influencers.

While the T-LLs focused primarily on co-creation (metaDesign) activities, they have also used these opportunities for communication and dissemination to increase public awareness of the project. The T-LLs have developed various communication materials (Figure 3) and organized or participated in several local events (Figure 4) .

Figure 3: Selection of local communication materials (flyers, posters)

Figure 4: Impressions of local events promoting future metaServices (Munich on the left, Limassol on the right)

3.5.2. Preparing for the launch of the metaServices

Each T-LL is tailoring its approach to local needs, with dedicated teams managing communication campaigns. A shared GANTT chart is currently being developed to coordinate outreach activities across all cities and to prepare for the launch of the metaServices. The current GANTT chart presented in the Annex focuses on the Integration and Testing Period (M19–M22, July–October 2025) and will be extended to cover the full launch phase of the metaServices at a later stage.

3.6. Monitoring Plan

Regular monitoring of the implementation of the Use Cases (UCs) will be conducted through a structured approach. Initially, this will occur on a monthly basis via WP3 coordination meetings and one-to-one sessions between the WP leader and the Task-Level Leader (T-LL).

In addition to this continuous oversight, more in-depth reviews will be scheduled as follows:

- **Month 21 (M21):** A consortium-wide meeting will assess overall progress and any challenges encountered, with the objective of identifying necessary corrective actions.
- **Month 23 (M23):** A follow-up meeting will verify that all demonstration activities have commenced as planned.

- **Months 25 to 32 (M25–M32):** Another consortium meeting will evaluate the ongoing implementation, highlighting progress made, any deviations from the original plan, and the rationale behind any adjustments.

All findings and insights from these monitoring activities will be documented in **Deliverable 3.3**.

In addition to the monitoring of implementation plans, impact monitoring and evaluation is planned in the project. The key dates for all these activities - data collections for the social embracement surveys and the SIEF – are included in the respective Gantt Charts in the Annex.

4. Evaluation of cross-fertilization activities

The metaCCAZE project tackles new and innovative topics in digital, automated, and connected mobility for which hardly any established blueprints or best practices currently exist. In this context, having a peer group with similar projects to openly discuss challenges and compare approaches proves to be extremely valuable. Within metaCCAZE, this peer group is formed by the different Transfer-Living Labs (T-LLs), which all have similarities in their UC designs - each focusing on digitally, interconnected or automated mobility solutions. They also share comparable obstacles, such as navigating regulatory frameworks, bringing different stakeholders together, achieving user and societal acceptance, leading ethical debates, and addressing technical issues like cybersecurity or emergency planning in case of system failure. Given that the projects operate in various European countries and in a different regional context, ensuring coherence and knowledge sharing is particularly important. This structured exchange, mutual learning and exchange of knowledge among T-LLs, is referred to as cross-fertilization. To facilitate this, several exchange formats have been established, including monthly online meetings to present progress, as well as in-person gatherings that foster interpersonal exchange and enable a deeper understanding of the different projects. These platforms offer T-LLs the opportunity to reflect on their own UC from new perspectives and to learn from one another on an equal footing. The following chapter analyzes and evaluates these cross-fertilization efforts.

4.1. Assessment Methodology

To gather information about the success and challenges of cross-fertilization activities, several feedback-formats were provided. First, the monthly WP3 meeting series served as a continuous exchange platform and an opportunity to collect feedback from all participants. T-LL leaders, sometimes T-LL supporters, and representatives from the institutions responsible for organization (Factual), communication (Steinbeiss Europa Zentrum), and evaluation (TUM) participated in these meetings, keeping each other informed about the latest developments in each Living Lab, as well as common activities and events.

Furthermore, two short questionnaire forms were distributed among the T-LL leaders to collect further feedback on the organized events and formats. In these surveys the organizations were asked to reflect on their experiences with the exchange formats and provide suggestions for future improvements. The first survey, conducted in January 2025 focused on the WP3 monthly meeting series. The second survey, conducted in May 2025 focused on the monthly meeting series and the consortium meeting in Amsterdam held in February 2025, where all the initiatives had the opportunity to meet in person. In the following part the main findings of these feedback formats are analyzed.

Table 15: Data collection for the evaluation of cross-fertilization activities

DATA COLLECTION	RESULTS
Feedback during the WP3 monthly meeting series	Constant feedback and adjustment, improvement
Questionnaire 1 (January 2025): about monthly meeting series	4 Responses (Each T-LL)
Questionnaire 2 (May 2025): about monthly meeting series and Consortium Meeting	4 Responses (Each T-LL)

4.2. Main Findings

The first questionnaire was conducted in February 2025 and aimed to gather suggestions for improving the WP3 monthly meeting series to accommodate greater cross-fertilization. Responses indicated varied levels of benefit from cross-fertilization during the common activities, with participants mostly reporting moderate benefits but a consistently high interest in each other's work. On one hand, common workshops and ongoing updates, particularly regarding stakeholder interaction in the UCs and metaDesign activities, were emphasized by interviewees. Key lessons learned included strategies for engaging stakeholders and users, technical deployment insights, and a better understanding of the complexities of scaling pilot projects. However, respondents noted that meetings often felt more like updates focused on sharing information rather than facilitating cross-fertilization and open exchange among the different T-LLs.

To enhance learning and collaboration, interviewees suggested clearer presentation of UCs in the sessions, more focused discussions on current challenges, and sessions that directly compare city approaches. The different stages of UC development were also mentioned as a challenge. Sometimes some UC were still in a conceptual stage while others were already in the implementation phase, making comparability more difficult.

As for important discussion topics, all T-LLs emphasized the importance of citizen and stakeholder engagement, with additional interest in legal and regulatory topics such as the operation of mobility hubs or legislative conditions for autonomous driving, as well as more technical topics such as autonomous driving or tradeable mobility credits. They shared a strong interest in the legislative frameworks that often make this transition difficult. In terms of contributions to the exchange, participants offered to share location-specific technical insights, strategies for stakeholder engagement, and the outcomes of ethical considerations, such as automation and employment, or mobility restrictions versus freedom. These discussions reflect broader value-driven debates that are vital to the cross-fertilization process within metaCCAZE.

The second questionnaire, conducted in May 2025, showed a marked increase in the perceived benefit of cross-fertilization activities. Participants noted stronger added value from the WP3 meeting series since the beginning of the year, particularly in relation to metaDesign and communication strategies, and overcoming legal or regulatory barriers. As the project progresses, T-LL are now more interested in the precise implementation and integration of the projects into existing systems. Several T-LLs also volunteered to share their own experiences with navigating complex bureaucratic procedures, such as those encountered in Limassol's multimodal mobility hub, which was described as particularly challenging due to Cyprus's bureaucratic complexities.

The consortium meeting was also evaluated very positively, with all respondents rating the benefit of the event as high or very high. Participants highlighted valuable lessons related to citizen engagement strategies and risk mitigation approaches for the upcoming phases of implementation, testing, and demonstration. A particularly fruitful bilateral exchange took place between Limassol and Munich, both of which are working on multimodal hub UC (LI-UC-03 and MU-UC-02), allowing for targeted comparison and mutual learning. Participants also noted topics they would like to bring into future exchanges, such as technical lessons learned, legislative insights, and stakeholder engagement practices tailored to their specific contexts.

4.3. Conclusions & Recommendations

The questionnaires and the continuous feedback throughout the project show that the mutual learning between the T-LLs is considered to be really important. The T-LL leaders and partners made it clear that in several cases the cross-fertilization activities have contributed to the adoption of ideas and successful concepts. Nevertheless, they still see potential for expansion and more room for mutual exchange. Cross-fertilization can be helpful throughout all the project stages and help overcome problems especially when it comes to overcoming implementation barriers in later project stages.

The partners highlight the importance of sharing detailed information about the practical aspects of defining and implementing the UCs. As UCs move closer to implementation, structural barriers such as legislation or stakeholder governance become increasingly visible and challenging.

Recommendations for the formal cross-fertilization activities of this project (as documented in Deliverable 1. 2 - Cross-fertilization and transferability framework and guidelines) as well as the WP3 meeting include:

- Organizing dedicated sessions for peer-to-peer exchange on organizational, governance/ regulatory and technical challenges that were identified in this evaluation.
- Adjust meeting structures and agendas to balance update-sharing with deeper thematic focus sessions - allowing for targeted learning on complex topics like legislation, specific technologies, or user acceptance.

5. Conclusion

This deliverable provides a comprehensive overview of the co-design processes, implementation plans, and cross-fertilization activities undertaken within the T-LLs of the metaCCAZE project. By assessing the metaDesign activities, this document underscores the importance of participatory approaches in shaping Use Cases and Business Innovation and Governance Models that are both contextually relevant and socially inclusive. The lessons learnt from the evaluation of these metaDesign activities may be relevant for other projects aiming to co-design mobility solutions.

The Implementation Plans outlined herein reflect the current operational readiness of the four T-LLs as they transition into the critical phases of integration, testing, and wide-scale demonstration. These plans not only consolidate the progress made to date but also ensure alignment with the upcoming project milestones. Finally, the review of cross-fertilization efforts highlights the value of mutual learning and exchange among the T-LLs. By identifying opportunities for deeper collaboration and thematic knowledge sharing, this deliverable contributes to strengthening the collective capacity of the project to address common challenges and enhance the quality and impact of its innovations.

Overall, this deliverable serves as both a progress monitoring tool and a strategic guide for the next stages of implementation. It supports the project partners in monitoring the past and future activities of the T-LLs, while offering transferable knowledge to external stakeholders interested in co-design methodologies and the deployment of innovative mobility solutions in real-world urban environments.

6. Literature /References

metaCCAZE (2024). D3.1. Trailblazer LL management, communication and engagement handbook.

metaCCAZE (2025). D1.4. MetaDesigned ZESM use cases for the trailblazer LLs and the SIEF.

metaCCAZE (2025). D4.1. Follower LL management, communication and engagement handbook.

7. Annex 1 – Gantt Charts

7.1. Amsterdam T-LL

Table 16: Gantt chart - Amsterdam

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
AM-UC 01	Engagement with public/private operators																																																
	Conceptual framework for technical integrations																																																
	Milest. 1: Collaboration agreement signed with Roboat																																																
	Purchase of equipment for autonomous functionalities																																																
	Design and construction of infrastructure																																																
	Integration of technologies																																																
	Decisions on operational settings																																																
	Milest. 2: First test of implementing the technology																																																
	Integration and testing																																																
	Milest. 3: SAIL demonstration event																																																
	Demonstration																																																
	Marketing, communication and dissemination																																																
	Data collection for SIEF																																																
	Data collection for surveys (T1.5)																																																
AM-UC 02	Engagement with public/private operators (narrative records, participation map, strategy map)																																																
	Testing site implementation plan (areas, assets, allocation, agreements)																																																
	Onboarding (testers, organized citizens, area managers, asset managers, cyclists)																																																
	Narrative Record Interviews (incl. extracting insights and summary)																																																
	Milest. 1: Narrative Complexity Summary (summarize identified complexity for stakeholders)																																																

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
	Place-based safety study																																																
	Milest. 2: Place-based Safety Resolution Map (location-based information for cyclists)																																																
	System configuration (knowledge base, TUMS, Wayflow, Test Rig)																																																
	Reference bicycle configuration																																																
	Milest. 3: Initial onsite testing and reporting (incl. real-time monitoring) (µ3.3)																																																
	Long-term onsite testing																																																
	Milest. 4: Systems updates (based on testing outcomes - knowledge base, TUMS, Wayflow, Test Rig) (µ4.4)																																																
	Reference bicycle updates																																																
	Project reporting																																																
	Site-based stakeholder reporting																																																
	Milest. 5: Document site learnings																																																
	Marketing, communication and dissemination																																																
	Data collection for SIEF																																																
	Data collection for Surveys (T1.5)																																																
AM-UC 03	Gathering requirements and pilot design																																																
	Data acquisition and processing																																																
	Modeling and algorithm development																																																
	Milest. 1: Modeling and development complete																																																
	Evaluating the proof-of-concept model																																																
	Designing a framework to evaluate the key indicators																																																
	Testing and integration																																																
	Demonstration																																																
	Milest. 2: Demo starts (µ3.3)																																																
	Citizens' acceptance survey (Before implementation)																																																
	Milest. 3: Mid-term evaluation (µ3.7)																																																
	Citizens' acceptance survey (After implementation)																																																

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
	Milest. 4: Demo concludes (μ4.4)																																																
	Data collection for SIEF																																																
	Evaluation of the key indicators																																																
AM-UC 04	Company partnership																																																
	Pilot Design																																																
	Use Cases for App																																																
	Milest. 1: Company partnership and pilot design complete																																																
	Development of algorithms																																																
	Evaluation survey development																																																
	Integration and testing																																																
	Demonstration																																																
	Milest. 2: Demo starts (μ3.3)																																																
	Initial survey																																																
	Milest. 3: Mid-term evaluation (μ3.7)																																																
	Final survey																																																
	Milest. 4: Demo concludes (μ4.4)																																																
	Data collection for SIEF																																																
	Data collection for surveys (T1.5)																																																

7.2. Limassol T-LL

Table 17: Gantt Chart - Limassol

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
	Limassol																																																
LI-UC 01	Development of the app/ platform																																																
	Selecting schools, sport centres, activity centres																																																
	Milest. 1: Define operational area																																																
	Milest. 2: Define the number of mini-buses																																																
	Design of virtual stops																																																
	Milest. 3: Define the number of private vans																																																
	Milest. 4: Decide the number of taxi drivers																																																
	Development of pricing strategy																																																
	Scheduling of the service (in co-creation with schools and after school activities)																																																
	Integration of the platform with the public transport operator´s vehicle management system																																																
	Testing & integration																																																
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for surveys (T1.5)																																																
LI-UC 02	Ensuring availability of electric bikes																																																
	Milest. 1: Arrival of electric bikes																																																
	E-bike demonstration event to promote their use																																																
	Agreement between the municipality and NextBike (locations of service)																																																
	Definition of locations (for tourists, students, including hilly terrains)																																																
	Integration with existing docking stations for conventional bikes																																																
	Demonstration																																																
	Data collection for SIEF																																																

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
	Data collection for Surveys (T1.5)																																																
LI-UC 03	Processes to secure agreement between Ministry of Transport and GASYO (owner of the Land)																																																
	Public Procurement for the study of the Mobility Hub																																																
	Milest. 1: Signed agreement between Ministry of Transport and GASYO																																																
	Milest. 2: Decide who will be responsible for the maintenance of the Hub																																																
	Assignment to a private engineer for the construction study																																																
	Processes to secure a building permit																																																
	Design of the Mobility Hub																																																
	Milest. 3: Define the facilities that will be included in the Mobility Hub																																																
	Milest. 4: Define the costs of the facilities that are going to be included																																																
	Construction of the Mobility Hub																																																
	Testing some of the services in the Hub																																																
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for Surveys (T1.5)																																																
LI-UC 04	Identification & collection of relevant datasets																																																
	Development of AI-based Incentivization & Recommendation Engine for recommending the charging schedule																																																
	Development of the Energy & Transport Platform																																																
	Testing & Integration																																																
	Milest. 1: Implementation of the platform on EMEL buses																																																
	Testing the integration of the algorithms with the platform																																																
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for surveys (T1.5)																																																

7.3. Munich T-LL

Table 18: Gantt Chart - Munich

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
	Munich																																																
MU-UC 01	Identification & initial integration of user requirements																																																
	UC validation and pot. application																																																
	Operationalisation and feedback loops (users and stakeholders)																																																
	Identification and initiation location process approval																																																
	Milest. 1: Selection of first set of parking zones																																																
	Milest. 2: Selection of second set of parking zones																																																
	Consultation process with stakeholders																																																
	Information/feedback of stakeholders on locations																																																
	Network level analysis implementation																																																
	Testing & integration																																																
	Alignment of app with sensor interface, testing in TUM facility (Munich Innovation Campus, MIC)																																																
	Sensor installation and app interface testing in Munich City Center																																																
	Testing real-time monitoring dashboard that displays occupancy of the DCM zones																																																
	Dedicated smartphone app and API to communicate occupancy to users																																																
	Testing and updating parking zones and app in case of construction / unavailability																																																
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for Surveys (T1.5)																																																
	Procurement of logistics bikes																																																

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
MU-UC 02	Identification & initial integration of potential users (requirements																																																
	UC validation and pot. application																																																
	Operationalisation and feedback loops (users and stakeholders)																																																
	General legal issues: contracts, taxes, operating role of C.of Munich																																																
	Evaluation & approval according to construction and fire safety requirements																																																
	Information/feedback of stakeholders about locations																																																
	Network level analysis implementation																																																
	Milest. 1: Selection of the location for the hub																																																
	Milest. 2: Procurement and installation of bicycles and required charging equipment																																																
	Testing & integration																																																
	Finalize the infrastructure and equipment for the multimodal logistics hub																																																
	Begin and consolidate operations by the logistics companies and resolve any potential early issues																																																
	Ensure necessary coordination between all stakeholders operating in the hub																																																
	Testing that the fleet of vehicles used by each logistics company can successfully operate in the hub																																																
	Test and ensure that all necessary facilities and physical requirements are provided (sufficient space and infrastructure for charging bikes, space for storing parcels, repair areas, loading bays, etc.)																																																
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for surveys (T1.5)																																																

7.4. Tampere T-LL

Table 19: Gantt Chart - Tampere

Use cases	Tasks /Milestones	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
Cross-cutting Tasks	Charging technology research																																																
	Remote operation system research																																																
	Vehicle tendering																																																
	Vehicle selection																																																
	Design the integrated automated charging system																																																
	Remote operations system design																																																
TA-UC 01	Route planning (with stakeholders)																																																
	Milest. 1: Routes decided																																																
	Integrating timetables and services to other PT																																																
	Testing and Integration																																																
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for Surveys (T1.5)																																																
TA-UC 02	Route planning (with stakeholders																																																
	Milest. 1: Routes decided																																																
	Integrating timetables and services to other PT																																																
	Testing and Integration																																																	
	Demonstration																																																
	Data collection for SIEF																																																
	Data collection for Surveys (T1.5)																																																

7.5. Communication Gantt Charts

Table 20: Communication Gantt charts

Use cases	Dissemination and Communication Planned Activities	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
Amsterdam																																																	
AM-UC 01	Demonstration event (SAIL 2025 - 20-24 August)																																																
	Autonomous Ship Conference and Expo (June 2025)																																																
	International Conference Presense (POLIS, Nov 2025)																																																
AM-UC 02	International Conference Presentation (CIVITAS)																																																
	Podcast on Townmaking approach and Place-based Safety																																																
	Presentation of Adaptive Speed Governance for Sports Venues																																																
	International Conference Presentation (POLIS, planned and subject to acceptance)																																																
	Press Release of initial test, subject to approval																																																
	Articles on Place-based Safety																																																
	Publication on Place-based Safety (planned, subject to approval)																																																
	Social Media Posts (Linkedin)																																																
	Adaptive Traffic Blog Post																																																
AM-UC 03	A press release announcing the launch of the waste collection services																																																
	International Conference Presense (POLIS, Nov 2025)																																																
AM-UC 04	Launch announcement (CONNEKT - 19 June - Delft)																																																
	LinkedIn campaign - TMC aquisition (june-september)																																																
	An activity during EU Mobility Week (related to aquisition)																																																
	International Conference Presense (POLIS, Nov 2025)																																																

Use cases	Dissemination and Communication Planned Activities	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
Limassol																																																	
LI-UC 01	Assignment of marketing campaign																																																
	Launch of webpage detailing use case																																																
	Social media content (videos/gifs/images)																																																
	Social media video content: Develop engaging video content to share and promote (FB/Instagram/TikTok/Youtube)																																																
	Social media: Launch campaign/coming soon/we are live/download app/communication posts towards parents and teens (FB, instagram)																																																
	Local influencer preview (potential end user with large social media outreach, who can test the mobility service)																																																
	Social media: ongoing content (FB/instagram/TikTok)																																																
	Podcast communication service / urban mobility and in general UC01																																																
	Branding on bus (9 buses)																																																
	Design and distribution of Local flyers																																																
	Design and placement of promotional banners																																																
	Branded Promotional gifts (USB sticks, chargers, water bottles, etc)																																																
	Press Release to online and traditional media - introduce WeeDRIVE application to public																																																
	Launch Event – Press conference with invitations extended to the Mayor, political figures from Limassol, Living Lab Partners and representatives from both online and traditional media outlets.																																																
	EU Mobility Week (Actions TBC)																																																
	EWGT 2025 Conference - 1-3 September 2025 (Presenter: Anne Patricio)																																																
	Community events (visits to schools and other community events to present service) TBC																																																

Use cases	Dissemination and Communication Planned Activities	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
	Update D&C Activity List with all carried out activities, including estimated reached audience																																																
LI-UC 02	Social media Content: post regarding project posted on linkedin																																																
	EU Mobility Week (Actions TBC)																																																
	Update D&C Activity List with all carried out activities, including estimated reached audience																																																
LI-UC 03	Social media Content: post regarding project posted on linkedin																																																
	Update D&C Activity List with all carried out activities, including estimated reached audience																																																
LI-UC 04	Social media Content: post regarding project posted on linkedin																																																
	Update D&C Activity List with all carried out activities, including estimated reached audience																																																
	Munich																																																
Both use cases	Stand at local event Europa*Rad																																																
	Webinar presentation "ASCEND x NeutralPath"																																																
	"EIT SIG Urban Logistics"																																																
	Website for metaCCAZE M-LL use cases at 'münchen unterwegs' (tbc)																																																
	Site events during EU Mobility Week 2025 and related to consortium meeting																																																
MU-UC 02	Opening event logistics hub																																																
	Press release/ social media campaign announcing start of logistics hub																																																
	Public event to promote cargo bikes for craft and trade (TBC)																																																
MU-UC	Press release/ social media campaign announcing start of dynamic curbside management																																																

Use cases	Dissemination and Communication Planned Activities	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14	M 15	M 16	M 17	M 18	M 19	M 20	M 21	M 22	M 23	M 24	M 25	M 26	M 27	M 28	M 29	M 30	M 31	M 32	M 33	M 34	M 35	M 36	M 37	M 38	M 39	M 40	M 41	M 42	M 43	M 44	M 45	M 46	M 47	M 48
01	Opening event dynamic curbside management																																																
	Participation in Transportation Research Symposium, Rotterdam																																																
	Social media content about the installation of the parking occupancy sensors at MIC																																																
	Tampere																																																
Both Use Cases	Launch a metaCCAZE section on Tampere Municpality's website or integrate it into Smart Tampere/Nysse.																																																
	Share updates via ITS Finland, ITS Factory, and Nysse newsletters.																																																
	Design and print local flyers and postcards.																																																
	Distribute flyers inside pilot vehicles.																																																
	Post updates on social media via Tampere Municipality, Nysse, University, and Remoted channels.																																																
	Create short videos of shuttle routes and user interviews.																																																
	Issue joint press releases with project partners.																																																
	Coordinate media efforts with Tampere University's communication team																																																

8. Annex 2 – Interview Questions (metaDesign assessment)

1. To what extent, were you able to engage with stakeholders from different types of organisations (i.e. public authorities, private companies, academic institutions, civil society groups)?
2. To what extent, were you able to engage diverse groups of citizens in this process?
3. How did you communicate (advertise) the metaDesign activities?
    a. Follow-up question: What digital and non-digital communication channels did you use?
4. In your view, to what extent were all participants actively contributing with new ideas about the Use Cases & the BIGMS during the metaDesign activities?
5. How did the information you receive during the metaDesign activities influence the design of your Use Cases and the BIGMS?
    a. Follow-up questions: Can you give me some specific examples of how the metaDesign process influenced your Use Cases or BIGMS?
6. Are there any other insights or lessons learnt from this process that might help other projects aiming to co-design mobility solutions?

9. Annex 3 – Questionnaires (cross-fertilization assessment)

Cross-fertilization questionnaire - December 2024

1. To what extent have you benefited from cross-fertilization (learning from other pilots) during WP3 meetings?
    - Very highly
    - Highly
    - Moderately
    - Minimally
    - Not at all

2. Please provide an example of a valuable insight or lesson you have gained from another pilot during these meetings:

3. What could be improved to enhance learning and collaboration in these meetings?

4. Which of the following topics would you like to explore further to enhance cross-fertilization? (Select all that apply)
    - Citizen engagement
    - Stakeholder engagement
    - Workshops organization
    - Legal and regulatory challenges
    - Marketing and communication
    - Technical deep dives on use cases, such as: Autonomous vehicles
    - Technical deep dives on use cases, such as: Tradable mobility credits
    - Technical deep dives on use cases, such as: Dynamic curbside management
    - Technical deep dives on use cases, such as: Transport and energy integration

5. Are there specific challenges, solutions, or insights from your pilot project that you would like to share with others?

6. What specific topics or issues would you like to learn more about from other pilot projects?

Cross-fertilization questionnaire - May 2025

1. Since the start of this year (2025), to what extent have you benefited from cross-fertilization (learning from other pilots) during the WP3 meetings series?
    - Very highly
    - Highly
    - Moderately
    - Minimally

- Not at all

2. Please provide an example of a valuable insight or lesson you have gained from another pilot during these meetings since the start of this year.

3. To what extent did the sessions organized during the Consortium meeting in Amsterdam help you learn from other pilots?
   - Very highly
   - Highly
   - Moderately
   - Minimally
   - Not at all

4. Please provide an example of a valuable insight or lesson you have gained from another pilot during the consortium meeting in Amsterdam.

5. Do you have any suggestions for WP3 meetings or other dedicated sessions to enhance learning and collaboration among the T-LLs?

6. Are there specific challenges, solutions, or insights from your pilot project that you would like to share with others?

7. What specific topics or issues would you like to learn more about from other pilot projects?

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