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Deliverable 4.2: Follower LLs: co-design activities, implementation preparations, monitoring plan

WP4

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Abbreviations and Acronyms

ACRONYM	Description
BIGM(s)	Business innovation and governance model(s)
BRT	Bus Rapid Transit
CCC	Climate City Contract
CSLP	Charging Station Location Problem
DRT	Demand Responsive Transport
EV(s)	Electric vehicle(s)
F-LLs	Follower Living Labs
GBFS	General Bikeshare Feed Specification (micromobility data status feeds)
GTFS	General Transit Feed Specification (public transport timetables)
KPI(s)	Key Performance Indicator(s)
LTE / 5G / NR-V2X	Long-Term Evolution / 5th Generation mobile network / New Radio V2X (ultra-low latency connectivity).
RSU(s)	Roadside Unit(s)
SIEF	Standardised Impact Evaluation Framework
SOR	Restricted Traffic Zone (derived from the Polish *Strefa Ograniczonego Ruchu*).
SUMP(s)	Sustainable Urban Mobility Plan(s)
T-LL(s)	Trailblazer Living Lab(s)
UC(s)	Use Case(s)
V2X / V2V / V2I	Vehicle-to-Everything / Vehicle-to-Vehicle / Vehicle-to-Infrastructure
WP	Work Package
ZESM	Zero-Emission Shared Mobility

Background: About the metaCCAZE project

Transport is the second largest source of greenhouse gas emissions and accounts for more than 30% of the total energy consumption. A series of global crises highlights 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, Kraków, Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region).

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 4.2 serves three key purposes within the metaCCAZE project regarding the transition of innovations to the six Follower Living Labs (F-LLs). First, it evaluates the localised co-design (metaDesign) activities—specifically LL1 through LL5—carried out in Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region). This assessment focuses on how the "localisation" process allowed Follower cities to refine technical prototypes originally pioneered by Trailblazer cities into locally-owned solutions that reflect unique administrative, legal, and socio-economic requirements. Participation levels, the inclusion of diverse citizen groups (including vulnerable populations), and the effectiveness of the Quadruple/Quintuple Helix engagement models are reviewed to ensure social acceptance and long-term viability. The evaluation demonstrates that success was driven by active adaptation rather than passive replication, utilising standardised tools like the D4.1 Handbook while maintaining the agility needed to resolve site-specific constraints.

Second, the deliverable outlines the Implementation Plans for the six F-LLs, documenting the comprehensive "reality check" involving administrative, legal, and technical preparations required for real-world operations. It includes detailed roadmaps for the upcoming project phases—Integration & Testing (M27-M38) and Wide-scale Demonstration—covering a diverse range of use cases such as large-scale bus electrification in Athens, multimodal hubs in Kraków and Miskolc, and automated on-demand services in Malta-Gozo, Milan, and Poissy, Yvelines (Paris Region). These plans detail specific objectives, technologies, and risk mitigation strategies to ensure each city is operationally ready for deployment.

Third, the document establishes the framework for collaborative and cross-fertilisation activities between Trailblazer "mentors" and Follower "mentees". These efforts utilise a thematic clustering approach—covering Logistics, Multimodality, Digital Solutions, and Electrification—to promote mutual learning and collective problem-solving. The exchange of insights via structured workshops and peer-to-peer channels is designed to accelerate implementation timelines and help followers bypass common pitfalls identified during the initial Trailblazer phase.

Overall, this deliverable functions as the primary operational blueprint and strategic bridge, transforming high-level technical designs into a localised urban reality. While its primary audience includes project partners, it provides a "recipe for success" and transferable models for external stakeholders, such as municipal authorities and mobility practitioners, interested in the resilient deployment of zero-emission shared mobility solutions.

1. Introduction

This deliverable represents the comprehensive series of reports associated with Work Package 4 (WP4), "Transfer & Demonstrate: Follower Living Labs". Building directly upon the foundational management and engagement strategies established in Deliverable 4.1 (Follower LL management, communication and engagement handbook), D4.2 (Follower LLs: co-design activities implementation preparations, monitoring plan) serves as the primary operational blueprint for the six Follower Living Labs (F-LLs) as they transition from conceptual planning into real-life implementation. The participating F-LL cities: Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region), represent a diverse range of urban fabrics, and this document details the intensive Use Case definition and "localisation" process required to adapt metaInnovations to their unique administrative, legal, and socio-economic contexts.

Representing the 'second wave' of deployment, this report documents the strategic transfer and adaptation of services originally pioneered by the four metaCCAZE Trailblazer Living Labs (T-LLs): Amsterdam, Munich, Limassol, and Tampere. To ensure a successful transition, this document details the implementation roadmap across two foundational project phases for the F-LLs:

- **MetaDesign & Preparatory Phase (M11–M26)**: This period focused on co-design and validation, utilising a bottom-up approach to ensure that Business Innovation and Governance Models (BIGMs) were refined to meet local needs. During this time, F-LLs engaged in intensive stakeholder and citizen dialogues (LL1–LL3), formal validation (LL4) to solve technical and social gaps and definition of KPIs and impact evaluation framework (LL5).
- **Integration & Testing Period (M27–M38)**: In this upcoming window, metaInnovations will be integrated into local systems, and operational readiness tests will be conducted to proactively identify and mitigate any local barriers before wide-scale demonstration.

The progression of F-LL Use Cases (UCs) has been supported by a structured evolution process, including the development of comprehensive UC descriptions, BIGM factsheets, and regular 1:1 alignment calls to ensure definitions are fully adapted to local requirements. While the four Trailblazer cities developed distinct, standalone pilots (e.g., UC-01, UC-02) to account for highly varied technical foundations, the Follower cities utilise a more integrated "a/b" numbering system (e.g., UC-01a, UC-01b). This change reflects a more synchronised metaDesign approach, where localised versions of the same core metaInnovations are being deployed across different urban contexts. By M24, most F-LL cities concluded the third iteration of these templates, marking their readiness to materialise and deploy these innovations in real urban settings. By synthesising these strategic, technical, and regulatory efforts, this document provides a unified roadmap for cities across Europe to navigate the integration and demonstration phases of metaInnovations within the F-LL framework.

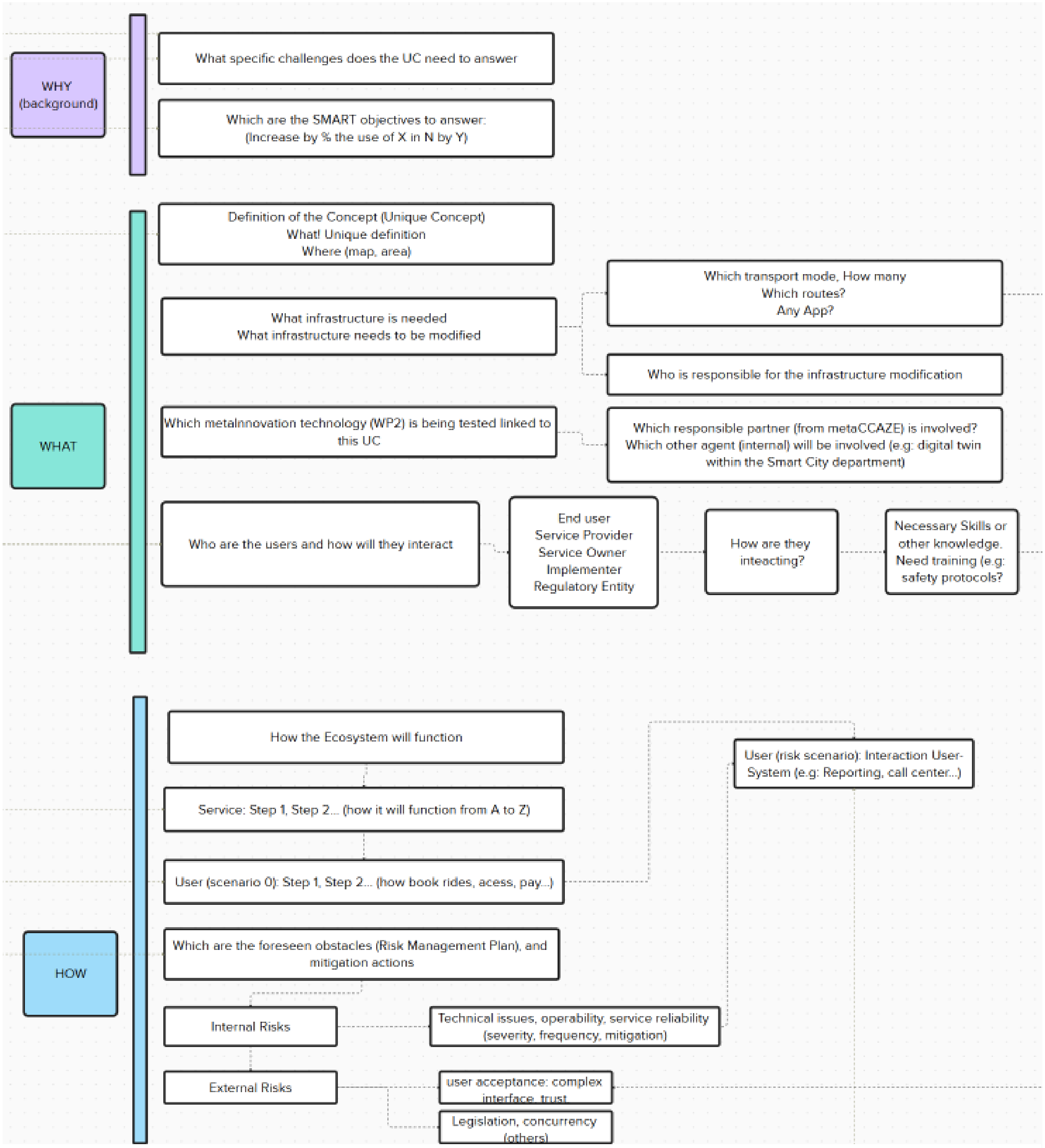

Figure 1: *UC Description and BIGMs structure. Extract from D1.4 MetaDesigned ZESM use cases for the trailblazer LLs and the SIEF*

1.1. Objectives of the Deliverable

metaCCAZE utilises a set of metaDesign activities to define its use case and guarantee the feasibility of adoption and deployment of the metaInnovations. While these were pioneered and demonstrated in the four Trailblazer cities (Amsterdam, Munich, Limassol, and Tampere), the F-LLs are now tasked with ensuring the validation and resilience of these metaInnovations within their own unique urban fabrics. This document serves as the operational bridge between the high-level technical designs established in early project stages and the localised UC definition and execution required for wide-scale testing.

1.2. Structure of the Document

The work documented in this deliverable is guided by **four core chapters** that ensure a robust transition from initial planning to operational execution:

- **Chapter 2: Assessment of localised Co-Design and Co-Creation** – Evaluates how the six Follower cities utilised the metaDesign activities (LL1–LL5) to refine technical prototypes into locally-owned solutions. This chapter details the assessment methodology—adopted from previous work to ensure comparability—and findings from proactive stakeholder engagement.

- **Chapter 3: Detailed Implementation and Readiness Roadmap** – Presents a comprehensive "reality check" for each of the six F-LLs. This core section documents administrative, technical, and legal preparations—such as site surveys and vehicle type-approvals—while defining localised monitoring strategies to ensure KPI data collection aligns with the SIEF.

- **Chapter 4**: **Monitoring Plan** – Defines the structured monitoring framework and KPI alignment necessary to track the technical, environmental, and social impacts of the F-LLs. It establishes the "digital handshake" and coordination roles required to ensure that local data collection remains consistent with project-wide evaluation standards.

- **Chapter 5**: **Evaluation of Cross-Fertilisation Activities** – Serves as the final assessment of the project's operational readiness, consolidating technical audits and administrative "reality checks" to ensure all Follower cities are prepared for wide-scale deployment.

1.3. Relation to Project Documents

Deliverable 4.2 functions as the essential operational bridge between the high-level technical designs developed during the project's early stages and the actual localised execution within the six F-LLs. This strategic alignment is primarily supported by Deliverable 4.1, which defines the specific governance models and engagement protocols for the follower cities by adapting the foundational strategies originally established in Deliverable 3.1 to meet the unique contextual needs of each location.

Furthermore, the technical implementation plans detailed in Chapter 3 are directly informed by the blueprints provided in Deliverable 1.4 regarding metaDesigned zero emission shared mobility (ZESM) use cases and the initial prototypes from Deliverable 1.1, ensuring that the transfer of metaInnovations remains fully consistent with the project's SIEF. The assessment of peer-to-peer learning presented later in Chapter 4 is grounded in Deliverable 1.2 regarding the cross-fertilisation and transferability framework. Finally, all data collection and monitoring procedures for the upcoming demonstrations are designed to strictly adhere to the finalised operational parameters and technical specifications defined in Deliverable 1.5. By synthesising these diverse strategic, technical, and regulatory sources, this document provides a comprehensive and unified roadmap for all partners to navigate the integration and wide-scale testing phases within the follower cities.

Figure 2: Ecosystem of deliverables linked to D4.2

1.4. Overall Approach

The overall approach centres on a rigorous "localisation" process where innovations are not merely replicated but are fundamentally adapted to meet the specific administrative, legal, and social requirements of each municipal environment.

The document begins by establishing the project's foundational objectives and the operational framework that guides the transition toward wide-scale testing. It then moves into a deep evaluation of the collaborative design process, highlighting how stakeholder engagement directly influenced the final service parameters to ensure social acceptance. This narrative continues with a technical readiness audit that documents the practical preparations—from site permits to monitoring strategies—required for real-world deployment. The report also details a cluster-based methodology for peer-to-peer learning, ensuring that the project’s collective expertise is leveraged to bypass implementation barriers. Ending by consolidating these assessments into a definitive visual timeline and readiness status for the upcoming demonstration phase.

2. Assessment of metaDesign activities

Within the metaCCAZE project, special attention is given to co-designing and co-creating mobility solutions in collaboration with internal project partners, external stakeholders and citizens. In contrast to top-down design approaches, where one organisation or consortium defines and designs the transport services and technologies they want to implement, bottom-up approaches emphasise 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 organisations responsible for implementing a service, for its future users and for 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 a 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 F-LLs to co-design their UCs and BIGMs, as well as their impact evaluation frameworks.

2.1. The metaDesign activities

metaDesign activities imply the co-creation and co-design activities that will be needed to define the Use Cases and their BIGMs that will be tested and demonstrated in the F-LLs. The metaDesign process started in the early phases of the project, in M11 (LL1), and the activities were ongoing until M26 (LL4+LL5), with the conclusion of the validation of the use cases and the SIEF.

Table 1: Overview of metaDesign Activities (LL1–LL5) for Use Case and BIGM Development

ACTIVITY	M	DESCRIPTION
LL1: mini-dialogues	11-14	The mini dialogues aimed at discussing and specifying the needs of stakeholders involved in the Sustainable Urban Mobility Plan (SUMP). The activities helped the F-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	17-19	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	17-19	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.

ACTIVITY	M	DESCRIPTION
LL4: Validation of UCs and BIGMs	21-26	The LL4 activities aimed 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	21-26	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 Climate City Contract (CCC) Frameworks.

Figure 3: The metaCCAZE event for the Malta-Gozo "On-demand autonomous mini-buses service" use case

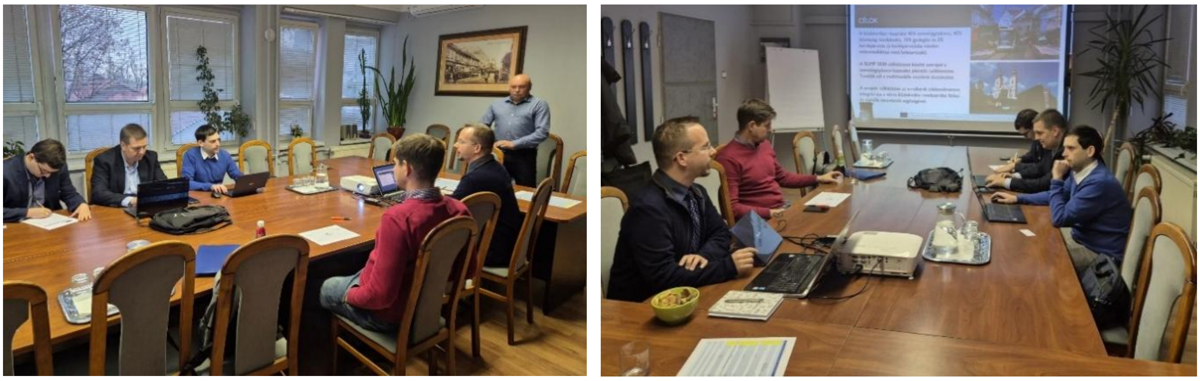

Figure 4: The metaCCAZE event for the Miskolc "Multimodal Hub" and "Multimodal Journey Planner" use cases

2.2. Assessment Methodology

The assessment methodology for the F-LLs is adopted from the framework established in Deliverable 3.2 to evaluate how effectively the metaDesign activities (LL1–LL5) supported the adaptation of meta-innovations to local urban contexts for Trailblazer cities. By utilising this initial methodology, this deliverable ensures the replicability of the assessment process across both city cohorts, allowing for a standardised comparison of results. This approach adopts the structural framework of D3.2 by utilising the same five evaluation categories to guide the monitoring of F-LL activities. While D3.2 performed a full qualitative assessment via interviews, this document serves to map the initial alignment of F-LL activities with these established project-wide standards. The five categories are the following:

- The participation of a broad range of stakeholders.
- The inclusion of diverse citizen groups.
- The use of varied communication channels.
- The level of participant engagement.
- The demonstrable influence of these activities on the final localised solutions.

The evaluation is primarily qualitative, drawing on desk research of local co-design outputs and semi-structured interviews with Follower City Leaders and technical partners from Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region). These interviews focus specifically on the "reality check" phase—evaluating the gaps between the initial Trailblazer UC specifications and the localised requirements dictated by specific legal, administrative, or technical constraints.

Furthermore, the methodology assesses the effectiveness of the knowledge transfer process itself. This includes evaluating the utility of the templates and guidelines provided in Deliverable 4.1 and the impact of cross-fertilisation activities conducted under the framework of Deliverable 1.2. By synthesising these qualitative findings, the assessment provides a comprehensive overview of how well the follower cities have navigated the transition from theoretical transfer to operational readiness.

2.3. Main Findings

The preliminary findings for the F-LLs emphasise that the transition from Trailblazer concepts to follower reality is not a linear replication but a process of intensive localisation. Drawing from the strategic frameworks established in Deliverable 4.1, the following details elaborate on the core findings of the preparatory phase, presenting a "recipe" for success that extends beyond the scope of metaCCAZE. These essential ingredients should be viewed as a broader framework for any technological adoption within a city, offering a value proposition that is applicable to diverse urban innovation strategies. Crucially, these ingredients are not independent; they are cumulative and deeply interconnected. In this sense, each step functions as a prerequisite for the next, creating a sequential path toward operational readiness. The following details elaborate on the core findings of the preparatory phase:

Contextualisation as a Success Factor

A fundamental finding of the preparatory phase is that the success of the F-LLs depends on the active adaptation, rather than the passive replication/adoption of metaInnovations that are being deployed in T-LLs. While the T-LLs provided the primary technical and conceptual blueprints for the metaInnovations, the F-LLs represent a "second wave" of deployment characterised by unique socio-economic, regulatory, and infrastructural conditions. Contextualisation is therefore the process of translating these core innovations—such as automated scheduling algorithms or demand-responsive transport platforms—into a format that is compatible with the specific urban fabric of cities like Athens, Kraków, or Milan.

In practice, this successful contextualisation involves identifying and addressing local barriers during the early metaDesign stages (LL1–LL3) as well as the actors involved. This allows F-LLs to know who they should include to solve these local barriers, making stakeholder mapping part of the process. For instance, technical specifications from Deliverable 1.4 regarding autonomous vehicle sensors or charging infrastructure must be reviewed against local street geometry and national safety regulations. Furthermore, the adaptation process requires aligning these services with the existing local SUMPs to ensure they complement rather than disrupt current public transport networks. By prioritising this "reality check" before the demonstration phase, cities can mitigate the risk of technical failure or low social adoption, ultimately ensuring that the transferred innovations are both resilient and locally relevant.

Active and Continuous Engagement via the Quadruple (and Quintuple) Helix

The effective adoption of metaInnovations relies on a collaborative ecosystem rather than isolated technical deployment. This is achieved through the Quadruple Helix model, which structures engagement across four critical pillars: public authorities, industry, academia, and civil society. By utilising this framework, F-LLs are able to synchronise technical development with societal needs and regulatory requirements. For instance, while industry partners focus on the deployment of zero-emission vehicles, public authorities ensure alignment with municipal traffic laws, and academic partners provide the analytical tools for impact monitoring.

In the context of the Follower cities, this model is often expanded into a Quintuple Helix, incorporating the broader environmental context and the overarching goal of ecological transition. This structured approach is vital for the "social embracement" of new mobility services. By involving citizens and environmental groups early in the metaDesign phase (LL1–LL5), F-LLs can identify potential resistance to shared mobility or automated features and address them through targeted communication and co-design adjustments. This ensures that the innovations are not only technically sound but also politically supported and socially accepted, creating a robust foundation for the wide-scale demonstration phase.

Inclusivity and Social Acceptance

A core finding derived from the F-LL preparatory phase is that the long-term viability of ZESM depends heavily on "social embracement" and the inclusivity of the co-design process. The evaluation of the metaDesign activities in cities like Athens, Miskolc, and Poissy, Yvelines (Paris Region) indicates that engagement must go beyond typical "tech-adopters" to include vulnerable groups, such as the elderly, low-income residents, and people with reduced mobility. By involving these diverse demographics early, the F-LLs ensure that the services—such as demand-responsive transport or automated shuttles—are designed to bridge existing mobility gaps rather than creating new barriers.

Furthermore, social acceptance is not viewed as a passive outcome but as a result of active, transparent communication. The findings show that localising the communication and marketing strategies of the adopted metaInnovations, as outlined in Deliverable 4.1, is essential to build trust within the community. When citizens see their feedback reflected in the operational parameters of a service—such as pick-up locations or app interface designs—their sense of ownership increases. This inclusivity is a prerequisite for the demonstration phase, as it mitigates the risk of public resistance and ensures that the proposed innovations contribute to a more equitable and accessible urban transport system.

Alignment with Local Policy Frameworks

For the operational readiness of Follower Living Labs, the necessity of aligning interventions with existing local and regional policy instruments is critical. Unlike the more experimental nature of early-stage pilots, the preparation for follower demonstrations requires a direct mapping of UCs against SUMPs and CCCs. This alignment ensures that the introduced services, such as zero-emission freight or shared passenger hubs, act as catalysts for pre-existing municipal goals rather than isolated projects.

The evaluation shows that this policy integration is a prerequisite for securing both political backing and the necessary administrative approvals, such as traffic exemptions for automated shuttles or dedicated parking for shared fleets. Furthermore, by rooting these innovations in local policy, F-LLs establish a clearer pathway for long-term financial viability and scaling beyond the project's duration. The findings suggest that cities which successfully integrated their metaDesign outcomes into municipal planning frameworks were better positioned to manage the transition from testing to wide-scale demonstration.

Standardisation and Refinement

To support an inclusive engagement, the metaDesign phase (LL1–LL5) provided Follower cities with standardised guidelines and a clear structure for stakeholder interaction. However, a high degree of agility was maintained—particularly within LL4—to ensure the format remained flexible. This balanced approach allowed F-LLs to collect and validate technical and social data at their best convenience, adapting the process to the specific needs of their local stakeholders and the unique requirements of their UCs. The preparatory phase demonstrated that these guidelines provided a vital "common language" for the six diverse Follower cities, ensuring that, despite their different local contexts, they followed a uniform pathway toward technical readiness and UC definition. This structured methodology allowed partners to progressively adapt from the technical components taken from the Trailblazer cities and presented through a series of local workshops and validation loops. To manage the harmonisation of all the data and understanding of the templates, orchestration leaders are in constant communication with Follower cities.

The evaluation highlights that the use of standardised templates for stakeholder mapping and engagement protocols—as established in the D4.1 Handbook—minimised administrative friction and ensured that the outputs from Follower Living Labs remained comparable to those of the Trailblazers. By adhering to these project-wide standards, the Follower cities were able to maintain technical integrity while performing the necessary "reality checks" to adapt solutions to their specific urban environments.

Importance of Knowledge Transfer Channels

A final key finding from the preparation phase is that the success of the F-LLs is intrinsically linked to the strength of the trend “setter” and “adopter” relationship established with the Trailblazer cities. The evaluation confirms that knowledge transfer is most effective when it occurs through structured, peer-to-peer exchange channels rather than just static documentation. Continuous interaction via monthly WP1+WP4 meetings, dedicated workshops, and one-to-one sessions allowed F-LL Leads to leverage the "lessons learned" from the first wave of deployment in Amsterdam, Munich, Limassol, and Tampere.

These channels proved essential for troubleshooting complex technical and administrative issues, such as integrating heterogeneous data sources or navigating specific legal exemptions for automated vehicle testing. The findings suggest that this "cross-fertilisation" significantly accelerated the implementation timeline for followers, as they were able to bypass common pitfalls identified during the earlier Trailblazer phase. Ultimately, these robust transfer mechanisms ensure that the project's metaInnovations are not only replicated but also improved upon through iterative learning across the entire consortium.

2.4. Conclusions & Recommendations

The transition of the F-LLs from planning to active demonstration represents a shift from theoretical transfer to localised execution. The evaluation confirms that the readiness of the six follower cities is a result of successful integration into their specific urban ecosystems through the following pillars.

- **Contextualization as a Non-Linear Process:** The preparatory phase confirms that success is driven by active adaptation rather than passive replication. The metaDesign process (LL1–LL5) revealed that while the technical core of the meta-innovations is stable, the administrative and social "fit" varies significantly across Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region).
- **Standardisation and Replicability:** The use of standardised guidelines from Deliverable 4.1 provided a necessary "common language" that minimised administrative friction, and by assessing the success of LLs' metaDesign activities from Task 1.6 (LL's cross-fertilisation and transferability activities), the project has validated that a standardised evaluation framework can be applied across diverse cohorts. This ensures that the results from F-LLs remain fully comparable to Trailblazer outcomes, reinforcing the project's SIEF.
- **Social Embracement through Inclusive Co-Design:** Utilising the Quadruple/Quintuple Helix model effectively shifted engagement from "tech-adopters" to a broader demographic, including vulnerable groups. This proactive inclusivity has mitigated the risk of public resistance and created a sense of local ownership over the new mobility services.

To translate these findings into successful wide-scale testing during the next phase, which directly translates to a successful definition phase, the following strategic actions are recommended for the WP4 partners:

- **From Alignment to Decision-Making Integration:** While UCs are currently aligned with local policy frameworks (e.g., SUMPs), the next phase should focus on embedding the resulting monitoring data directly into municipal decision-making tools. This will demonstrate the long-term value of the innovations beyond the project duration.
- **Transition to Active Recruitment:** As demonstrations launch, the focus on social acceptance must shift from passive surveys to active user recruitment. Efforts must ensure the participant base reflects the diverse demographics—such as low-income residents and people with reduced mobility—identified during the co-design phase.
- **Agile Knowledge Exchange:** The "Cross-Fertilisation" channels between Trailblazers and Followers should be employed promptly and transitioned into a "Rapid Response" format. As real-world technical challenges arise during integration, the peer-to-peer support system will be critical for maintaining the implementation schedule and bypassing common pitfalls.
- **Iterative Technical Calibration:** Based on the "reality checks" performed during the metaDesign phase, cities should maintain a buffer for technical adjustments. The ability to fine-tune algorithms, charging protocols, or app interfaces based on initial pilot results will be essential for meeting the project's performance KPIs.
- **Continuous Expert Availability:** Ensuring the continued availability of technical experts to provide follow-up guidance after the initial validation loops will be vital for navigating the transition from testing to full-scale operational execution.

3. Detailed Implementation and Readiness Roadmap

Chapter 3 presents the detailed Implementation Plans for the six F-LLs: Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region), serving as a comprehensive roadmap for their transition from conceptual adaptation to real-world operations. This section provides a localised "reality check" for the project by documenting the specific administrative, technical, and legal preparations required to adapt core metaInnovations to each city's unique urban fabric and regulatory environment. Drawing on technical blueprints and initial prototypes established in previous project phases, the chapter outlines the specific objectives, scope, and resource allocations for each city's UCs, which range from optimised electric bus networks and multimodal freight hubs to automated passenger services and intelligent road infrastructure. Furthermore, this chapter details the localised communication and marketing strategies designed to foster social acceptance through the Quadruple Helix model, alongside a structured monitoring plan that utilises a series of coordination meetings and reviews to ensure all demonstration activities remain aligned with the project's SIEF.

The following diagrams represent the general timeline of the preparatory phase and the integration and testing period of the 6 Follower cities.

Athens

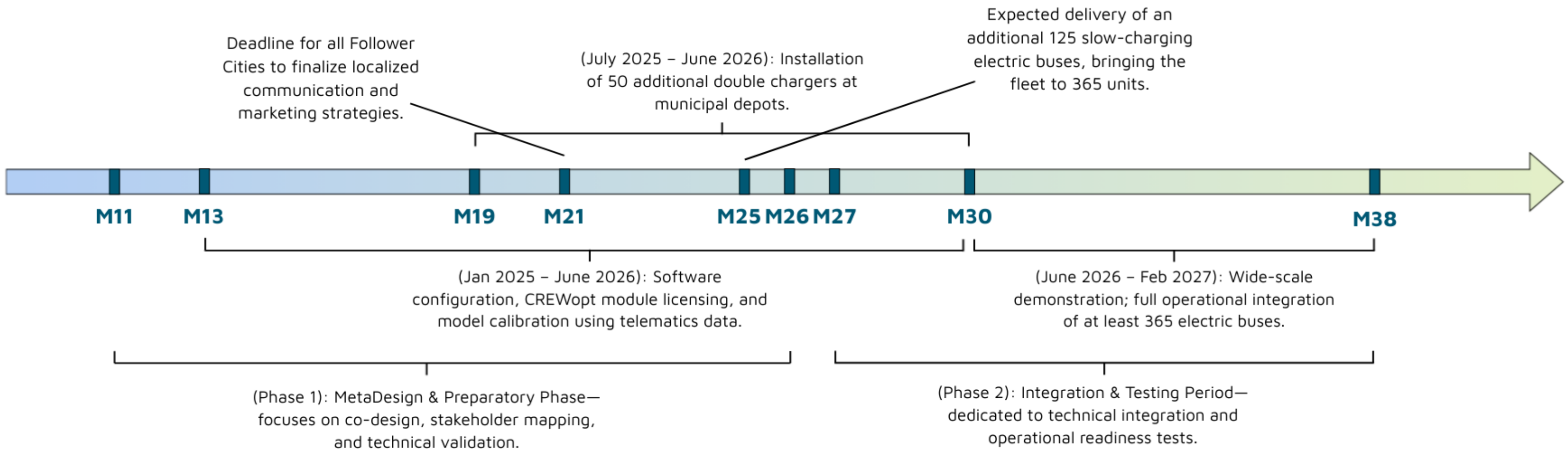

Figure 5: Athens general timeline and special milestones

Kraków

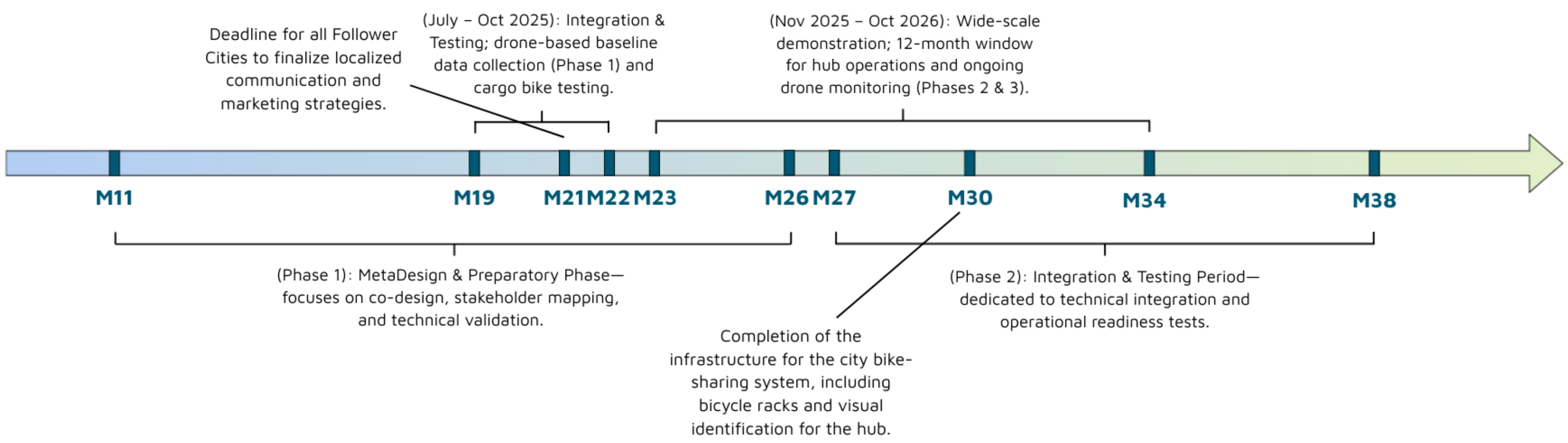

Figure 6: Kraków general timeline and special milestones

Malta-Gozo

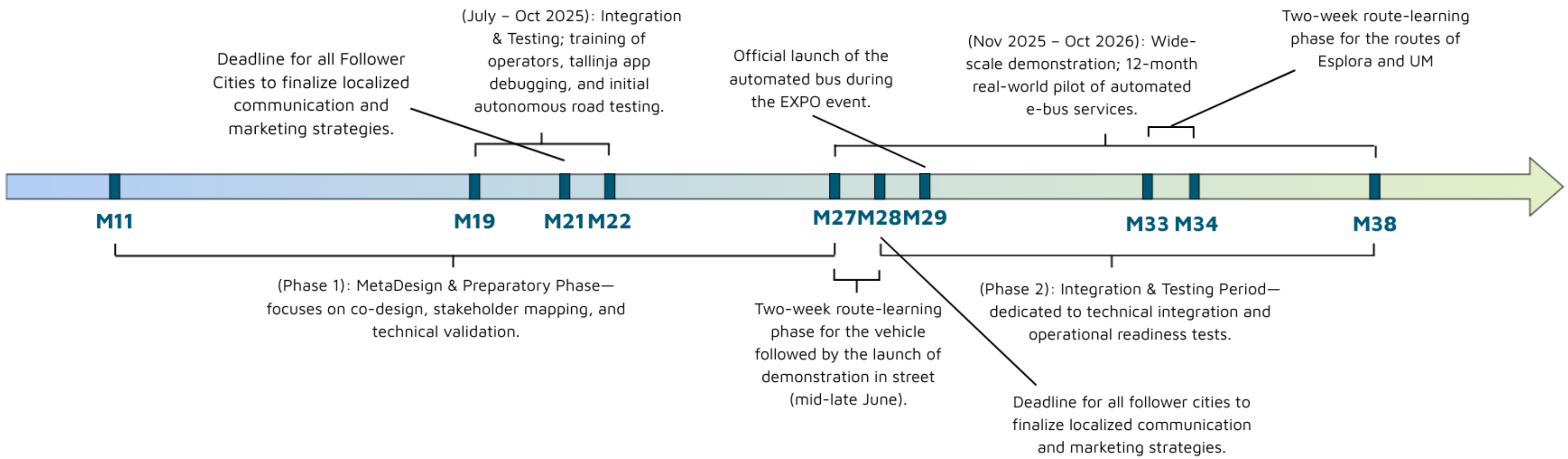

Figure 7: Malta-Gozo general timeline and special milestones

Milan

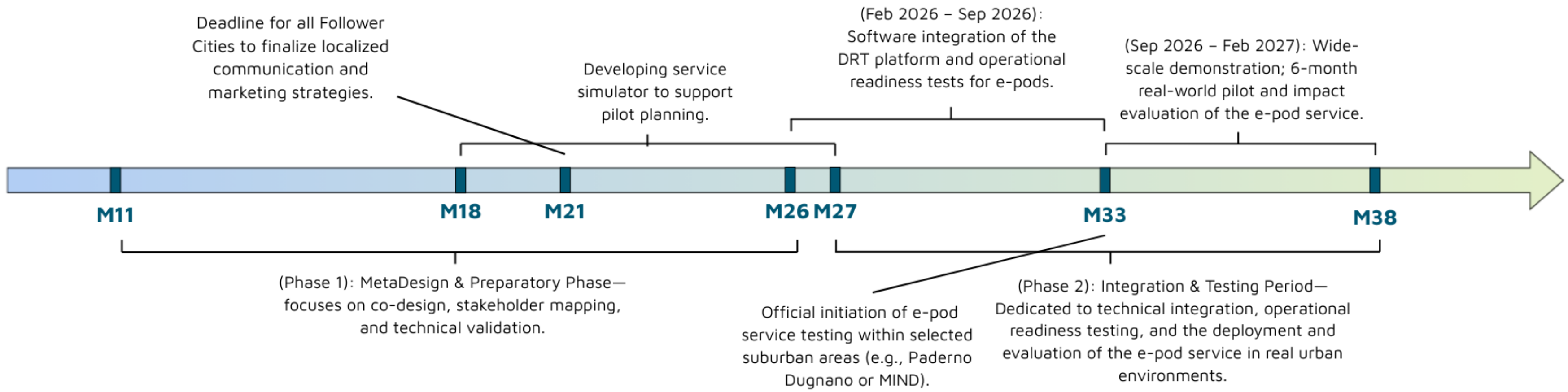

Figure 8: Milan general timeline and special milestones

Miskolc

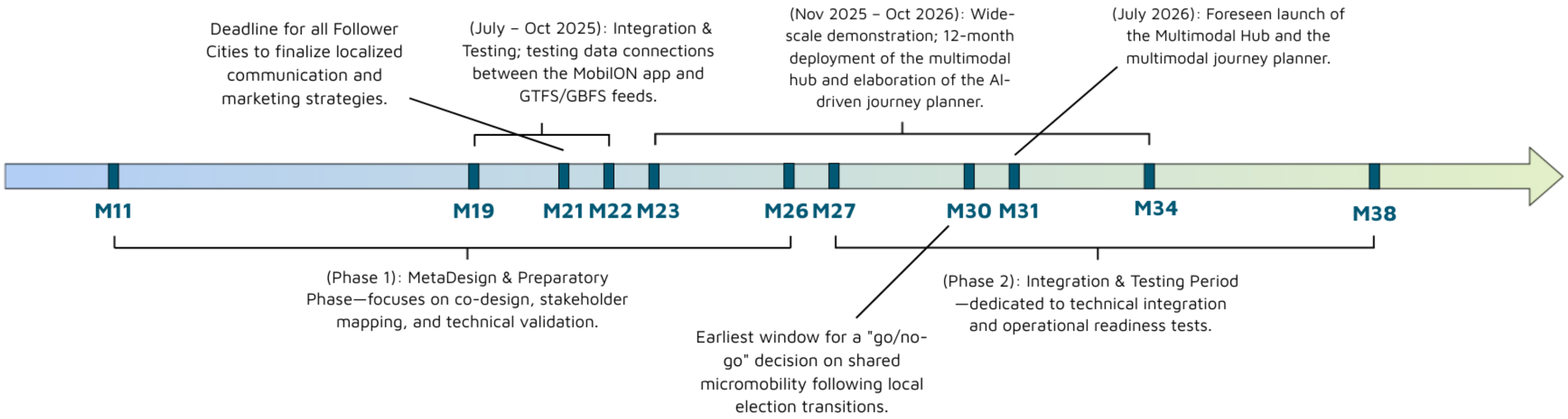

Figure 9: Miskolc general timeline and special milestones

Poissy, Yvelines (Paris Region)

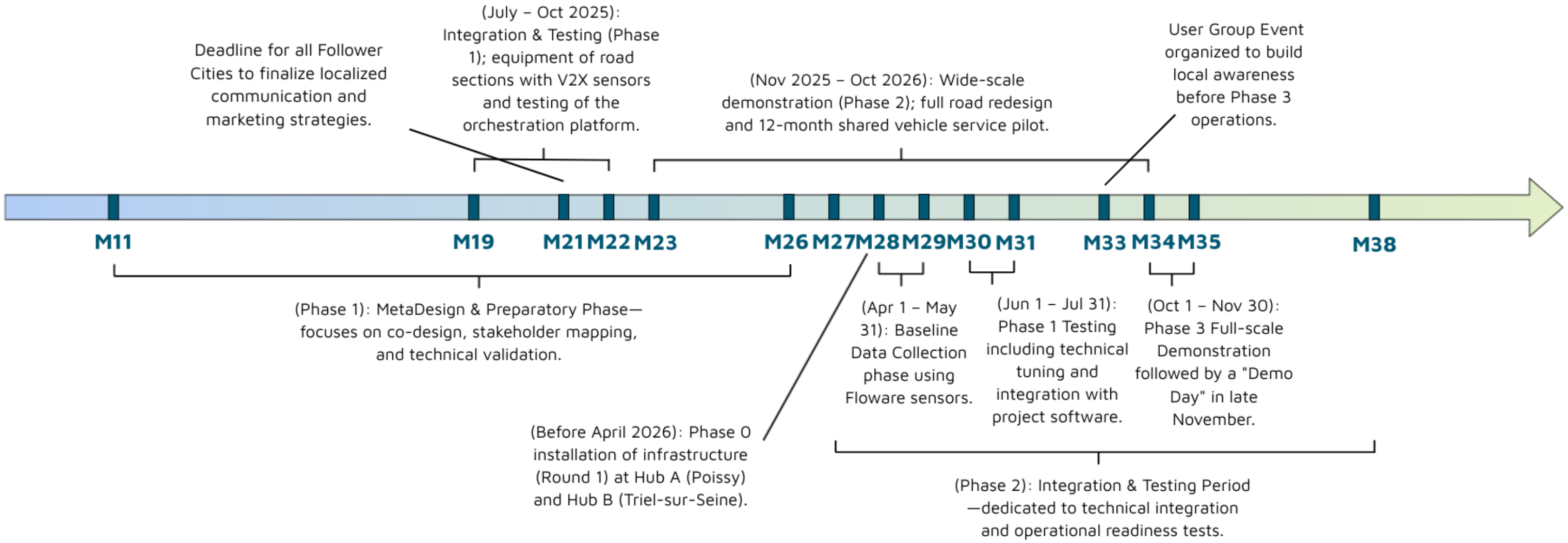

Figure 10: Poissy, Yvelines (Paris Region) general timeline and special milestones

3.1. Athens F-LL

Athens is focused on the large-scale electrification of public transport through the deployment of over 360 electric buses and a network of 120 double chargers. Building upon the energy-transport integration and fleet management principles established by the Trailblazer cities of Limassol and Munich, Athens utilises advanced AI-based optimisation to refine vehicle scheduling, driver duties, and the strategic placement of charging infrastructure to reduce operational costs and energy waste. These efforts ensure service reliability for over 1,100 daily buses while directly supporting the city’s climate neutrality commitments.

3.1.1. AT-UC01-A - Optimised Scheduling and Route Planning for Electric Bus Integration in Athens

The first part of the UC for the Athens LL focuses on the operational and tactical integration of a rapidly expanding electric bus fleet into the city's dense urban core. Following the successful deployment of 240 electric buses, Athens is preparing to integrate an additional 125 units by early 2026, necessitating advanced decision-support tools to manage the complexities of vehicle and crew scheduling. This UC utilises sophisticated Operations Research models—specifically the Multi Depot Electric Vehicle Scheduling Problem and the Electric Bus Crew Scheduling Problem (EB-CSP)—to design optimal vehicle "blocks" and driver duties that account for current slow-charging infrastructure and limited battery autonomy. By applying these AI-based scheduling tools, the LL aims to minimise energy waste and "deadheading" (non-revenue trips to and from depots), optimise workforce and electric vehicle allocation, and reduce the failure rate of scheduled bus blocks during extreme weather conditions.

metaDesign & Preparatory Phase

The preparatory phase for AT-UC01-A focused on aligning the technical capabilities of the National Technical University of Athens (NTUA) with the real-world operational data and needs of the public transport authority, OASA, and its subsidiary OSY. Key metaDesign activities included:

- **Stakeholder Alignment and Requirement Definition:** Extensive 1:1 sessions and workshops were held to identify mandatory operational requirements, such as maintaining a minimum of 1,100 buses in daily circulation while phasing out older, polluting Euro 2 and Euro 5 vehicles.
- **Data Integration and Modelling:** A critical part of the preparation involved the transfer of static and dynamic data from the OASA Telematics system and the Electric Bus Monitoring Platform to NTUA for model calibration. This ensures the algorithms can simulate "What-if" scenarios based on actual energy consumption and variable travel times in Athens.
- **Technical Readiness and Infrastructure Mapping:** The phase verified that while physical infrastructure modifications are minimal, digital integration with OASA's existing tactical planning software (e.g., Hastus) is required. A budget of €110,000 has been allocated to expand software licenses with the CREWopt module to support these integrated vehicle and crew schedules.
- **Risk and Validation Planning:** Preparatory workshops identified primary internal risks, such as grid upgrade delays and the impact of extreme temperatures on battery performance, leading to the development of mitigation strategies like phased installation and predictive energy management.

Integration & Testing and Wide-scale Demonstration Phases

Table 2: Implementation Plan - AT-UC01-A - Optimised Scheduling and Route Planning for Electric Bus Integration in Athens

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Validate Multi Depot Electric Vehicle Scheduling Problem MD-E-VSP and EB-CSP models using historical OASA telematics data to ensure vehicle blocks and crew duties are mathematically feasible. • Calibrate energy consumption simulations for Athens' dense urban core. • Develop a Line Planning Model (EV-LPP) to address vehicle autonomy constraints.	• Full operational integration of at least 365 electric buses (240 from Phase 1 and a minimum of 125 from Phase 2) into the daily fleet by 2026/2027. • Reduce the current 3% bus block failure rate caused by energy deficits. • Quantify CO_2 reductions using real operational metrics.
Technologies, Infrastructure & Services	• Expand OASA's Hastus software license with the CREWopt module via a €110,000 budget. • Establish a digital "handshake" between NTUA algorithms and existing OASA Telematics and E-bus Monitoring Platforms. • Testing of "What-if" scenarios for expanded charging networks.	• Full-scale use of AI decision-support tools by transport planners to manage fleet energy autonomy and reduce driver rostering and vehicle scheduling costs. • Management of charging operations for 120 double 180kW chargers deployed across at least 5 major depots (Renti, Attiki, Petrou Ralli, Agios Dimitrios, Votanikos).
Location	• NTUA/OASA Digital Environment: Initial testing utilising historical data from the wider Athens Metropolitan bus network.	• Municipality of Athens and wider Attica Region. • Targeted high-demand routes: Bus Lines 420, 122, and 550.
Risks & Challenges	• Internal: Managing data misconfigurations or software glitches during the ex-ante simulation phase. • Technician Training: Lack of personnel familiarity with new AI-based optimisation software.	• External: Mitigating grid upgrade delays (DEDDIE/DEI) and charging capacity shortages. • Operational: High energy demand/HVAC drain during extreme heat/cold. • Acceptance: Potential resistance to modified routes from citizens or drivers.
Participants & Engagement	• NTUA (Technical Development) and 5–6 senior OASA/OSY transport planning experts. • Technical coordination with energy providers DEI and DEDDIE for infrastructure alignment.	• OSY Drivers and Technicians: Active feedback loop to ensure social acceptance and refine schedules based on daily reality. • Municipality of Athens: Alignment with CCC goals.
Timeline	Refer to Figure 5 for specific timelines.	

3.1.2. AT-UC01-B - Optimal Planning of Locations of E-charging Infrastructure for the Athens Electric Bus Network

The second part of the UC for the Athens LL addresses the strategic challenge of building a resilient and cost-efficient charging network to support the city's massive transition to electric public transport. While Athens has already operationalised 70 double 180 kW chargers, it faces the immediate need to install 50 more units to support the 240 electric buses currently in service and the additional 125 e-buses arriving by early 2026. AT-UC01-B moves beyond simple hardware installation by applying the Charging Station Location Problem (CSLP) optimisation model, a data-driven tool developed by the National Technical University of Athens (NTUA). This model identifies the mathematically optimal number, type (slow vs. fast), and placement of chargers within limited depot spaces while accounting for complex grid constraints. By synchronising transport operations with electrical grid capacity—managed across two different providers, DEI and DEDDIE—the city aims to minimise both upfront capital investment and long-term operational costs, ultimately targeting a 30% reduction in energy expenditure compared to diesel operations.

metaDesign & Preparatory Phase

The preparatory phase for AT-UC01-B focused on building the "digital ground" required to transition from ad-hoc infrastructure placement to a system-level optimisation approach. Key activities included:

- **System Mapping and Grid Coordination:** A critical component of the preparation involved identifying the split in energy responsibilities: DEI manages projects up to 10 MW, while DEDDIE handles larger grid upgrades. The preparatory phase ensured that infrastructure planning was aligned with these varying regulatory and technical requirements to avoid grid-level bottlenecks.
- **Depot and Spatial Analysis:** Technical teams conducted spatial assessments of the five major depots—Renti, Attiki, Petrou Ralli, Agios Dimitrios, and Votanikos—to identify physical constraints that could limit charger placement or vehicle movement.
- **Model Calibration with Real-World Data:** The phase facilitated the transfer of operational data from OASA's telematics and mobility management systems to NTUA. This allowed the CSLP model to be calibrated against actual bus routes and energy consumption patterns rather than theoretical estimates.
- **Stakeholder Risk Validation:** Through metaDesign workshops, partners identified high-level risks, such as procurement delays and power-out incidents during extreme weather. Mitigation strategies were developed, including the prioritisation of depots with existing electrical capacity and the implementation of intelligent load-balancing protocols.

Co-funded by the European Union

Integration & Testing and Wide-scale Demonstration Phases

Table 3: Implementation Plan - AT-UC01-B - Optimal planning of locations of e-charging infrastructure for the Athens electric bus network

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Finalise and calibrate the CSLP model using real-world Athens data. • Validate network efficiency and performance across major depots under simulated peak load conditions.	• Achieve full operational readiness of 120 double 180 kW chargers by early 2026. • Support the daily operation of at least 365 electric buses with zero power-out incidents. • Reduce operational energy costs by 30% compared to diesel.
Technologies, Infrastructure & Services	• Establish digital integration with OASA telematics and mobility management systems for data sourcing. • Perform spatial assessments and potential reorganisations of 5 major depots (Renti, Attiki, etc.).	• Deploy the CSLP optimisation tool to manage strategic network design and charger mix (slow vs. fast). • Utilise intelligent load balancing and predictive energy management to handle extreme weather demands.
Location	• **NTUA Labs**: Software development and initial model implementation. • **OASA/OSY Depots**: Physical site surveys and electrical grid capacity testing.	• Implementation across at least five depots: Renti, Attiki, Petrou Ralli, Agios Dimitrios, and Votanikos. • Service area covers the Municipality of Athens and the wider Metropolitan area.
Risks & Challenges	• **Technical**: Complexity of the CSLP software for non-technical planning staff. • **Operational**: Uncertainties in travel times and energy consumption between chargers and stops.	• **External**: Delays in grid upgrades (DEI/DEDDIE responsibilities) and procurement bottlenecks. • **Climatic**: High HVAC energy drain during extreme summer/winter months.
Participants & Engagement	• **NTUA**: Lead developer of planning models. • **OASA/Anaplassis**: Providers of data and operational field-knowledge.	• **OSY**: Direct fleet management and driver/technician supervision. • **DEI/DEDDIE**: Grid operators for large-scale energy upgrades (>10 MW).
Timeline	Refer to Figure 5 for specific timelines.	

3.2. Kraków F-LL

Kraków is a heritage-sensitive city balancing the preservation of its UNESCO-listed Historic Centre with the requirements of a modern mobility system. Drawing on the hub-centric logistics and micromobility monitoring concepts pioneered in Amsterdam and Tampere, the city aims to achieve climate neutrality by reducing car dependency and greenhouse gas emissions, particularly within its dense, tourist-heavy Restricted Traffic Zone (SOR).

3.2.1. KR-UC01-A - Multimodal Passenger Hub

The first part of the UC for the Kraków LL is a flagship demonstration project designed to transform underutilised urban space beneath a newly elevated railway viaduct at the Kraków Grzegórzki station into a multifunctional hub. This location is strategically significant as it sits only 100 metres from the Second Ring Road and serves as a gateway to the SOR and the UNESCO-listed Historic

Centre, where traditional combustion-engine delivery vehicles face significant access constraints. The hub operates as a dual-function facility intended to harmonise urban freight and resident mobility for Urban Logistics Operators by providing free access to modular transhipment containers that function as super short-term micro-warehouses, and for Residents and Micro-entrepreneurs by providing a free-of-charge cargo bike rental service and functions as a Park-e-Bike station. The project aims to achieve a 50% increase in cargo bike B2B deliveries and a 30% reduction in fossil-fuel delivery fleets within the pilot area by 2027. Beyond its technical logistics function, the hub is an urban regeneration model that revitalises the Grzegórzki district by adding social amenities like greenery, social containers for staff, and expanded bicycle parking for rail travellers, thereby redefining urban identity through green innovation.

metaDesign & Preparatory Phase

The preparatory phase focused on the contextual adaptation of zero-emission logistics solutions to meet the city's unique administrative, legal, and technical requirements. This phase involved a transition from high-level technical prototypes to locally-owned solutions that reflect specific constraints within the SOR and the UNESCO-listed Historic Centre.

- **Stakeholder Alignment and Co-Design:** Kraków utilised the metaDesign framework (LL1–LL5) to collaboratively refine the hub's dual-function model with internal partners and external stakeholders, ensuring the service meets the needs of both residents and logistics operators.
- **Site Preparation and Administrative Planning:** The city allocated municipal staff from the Public Transport Authority (ZTP) to manage the repurposing of a city-owned property on Wrzesińska Street. This included initiating the demolition planning process and coordinating essential utility connections, such as electricity for e-bike charging and high-performance internet for operational monitoring.
- **Establishment of Governance Models:** A two-year public-private partnership model between the City of Kraków and major logistics stakeholders, including InPost, GLS, and DPD, to share responsibilities for infrastructure use and data collection is planned.
- **Technical Procurement:** ZTP completed the acquisition of a fleet of 6 professional-grade electric cargo bikes, specifically selecting robust models capable of meeting the heavy-duty requirements of B2B deliveries in dense urban environments.
- **Integration of Monitoring Systems:** The phase included configuring the MobiLysis drone-based data collection platform, which involves adapting AI algorithms like StrongSORT for aerial traffic analysis to provide high-resolution insights into movement patterns and traffic safety.
- **Risk Validation and Contingency Planning:** Workshops identified critical risks, such as legal approval delays for the Wrzesińska location, resulting in a contingency strategy to prioritise cargo operations under the railway viaduct spans if primary site access is delayed.

These activities ensured that Kraków moved beyond conceptual transfer to a state of operational readiness for the upcoming Integration & Testing period.

Co-funded by the European Union

Integration & Testing and Wide-scale Demonstration Phases

Table 4: Implementation Plan - KR-UC01-A - Multimodal passenger hub

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Validate the functionality of the automated rental container for cargo bike distribution. • Verify the efficiency of the transhipment workflow from delivery vans to cargo bikes. • Test the operational coordination between ZTP staff and early logistics adopters.	• Achieve a 50% increase in the number of parcels delivered via cargo bikes in the SOR and II Ring Road by Q4 2027. • Replace 30% of the fossil-fuel delivery fleet with zero-emission alternatives in the pilot area. • Improve delivery fluidity within the II Ring Road by 20%. • Increase long-term cargo bike rentals via the LajkBike system by 100%.
Technologies, Infrastructure & Services	• Procurement and testing of 6 professional-grade electric cargo bikes. • Setup of 3 modular transhipment containers for micro-warehousing. • Installation of basic IoT infrastructure, including CCTV and high-performance internet.	• Full deployment of a weather-protected loading area. • Installation of 12 sets of bike racks for the Park-e-Bike system. • Operation of a refrigerated trailer spot for cold-chain stakeholders. • Integration of the MobiLysis drone-based platform to analyse traffic flow and safety at the hub.
Location	• Space beneath the elevated railway viaduct spans at the Kraków Grzegórzki station.	• Permanent setup at the municipal site on Wrzesińska Street (following demolition of existing buildings). • Influence area covering the SOR and the UNESCO Historic Centre.
Risks & Challenges	• **Legal delays:** Appeals from neighbouring property owners stalling demolition at Wrzesińska. • **Connectivity issues:** Potential disruptions in the hub's internet affecting rental system access. • **Technical hurdles:** Misconfiguration of the automated rental software.	• **Environmental impact:** Reduced user trust and bike efficiency during harsh winter conditions. • **Operational friction:** Late bike returns or equipment malfunctions during peak delivery hours. • **Acceptance:** Low public awareness of service benefits among local HoReCa businesses.
Participants & Engagement	• **Public Transport Authority (ZTP)** staff overseeing system configuration and maintenance. • **MobiLysis specialists** for initial drone-based traffic baseline data collection. • Initial logistics partners (e.g., InPost, GLS, DPD) participating in early transhipment tests.	• **Local entrepreneurs** (restaurants, shops) utilising free rental cargo bikes for B2B deliveries. • **Residents and tourists** using the Park-e-Bike and LajkBike rental services. • **Rail travellers** utilising expanded bike parking at the SKA Grzegórzki station.
Timeline	Refer to Figure 6 for specific timelines.	

3.2.2. KR-UC01-B - E-cargo Bikes & E-bikes Demand and Monitoring

This second part of the UC introduces a modular, autonomous urban mobility monitoring system of the next generation, specifically designed for high-density and heritage-sensitive areas like Kraków's UNESCO-listed centre. Developed by MobiLysis, the system employs a swarm of drones to collect high-resolution traffic data, surpassing traditional fixed sensors or manual counting. The core innovation lies in combining innovative aerial measurement with social research, deploying a dedicated application to analyse the transport behaviour of selected volunteers.

Through AI-driven processing—including the adaptation of the StrongSORT algorithm for aerial traffic scenes—the system transforms raw video data into actionable insights. These insights enable the city to optimise traffic flow, strengthen intermodal integration between regional rail and bike transport, and identify safety-critical conflict points along designated delivery corridors. Ultimately, the UC provides a strategic environmental dimension to urban logistics by measuring emission reductions and delivery efficiency, ensuring that the city's transition to sustainable transport is backed by high-quality, privacy-friendly data.

metaDesign & Preparatory Phase

The preparatory phase for KR-UC01-B focused on building the digital and operational framework for high-resolution monitoring. Key activities included:

- **Technical Development:** MobiLysis worked on mission planning, geofencing, and clustering trajectories into standard paths to improve tracking robustness in diverse traffic scenes.
- **Aviation Coordination**: Preparations involved checks with U-Space/PAŻP to manage temporary no-fly constraints and secure aviation authorisations for the drone sorties.
- **Volunteer Engagement:** The project initiated the deployment of the transport behaviour research application, which allows volunteers to log travel patterns and provide feedback on the social acceptance of new mobility models.
- **Baseline Data Collection:** The first of three research sessions was planned (Phase 1: Before implementation) to establish a baseline for traffic flows and safety metrics before the multimodal hub (KR-UC01-A) becomes fully operational.
- **Infrastructure-Light Setup:** Confirmation that no new physical infrastructure is needed, as drones utilise on-board sensors and can be supported by mobile monitoring points mounted on street lighting poles.

Integration & Testing and Wide-scale Demonstration Phases

Table 5: Implementation Plan - KR-UC01-B - E-cargo bikes & e-bikes demand and monitoring

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Validate drone swarm navigation based on predefined GPS coordinates. • Verify AI analytics accuracy in distinguishing between pedestrians, cargo bikes, and delivery vans. • Test the functionality of the volunteer behaviour tracking app.	• Achieve a 15% increase in bicycle traffic in the Kazimierz–Grzegórzki area by Q4 2027. • Deliver actionable safety reports for 20% of monitored corridors. • Create a dynamic map of optimal cargo transport flows.
Technologies, Infrastructure & Services	• Deployment of the MobiLysis drone coordination platform for mission planning.	• Full deployment of interactive dashboards and APIs for ZTP officials. • Continuous use of multi-constellation Global Navigation Satellite System with inertial fallback for peak-hour reliability.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• Testing of edge buffering and cloud backup routines. • Initial configuration **of AI image analysis** software.	• Secure data storage in the ZTP Data Warehouse.
Location	**Delivery Hotspots**: Grzegórzecka & Blich crossing (Market Hall), Wielopole & Sienna crossing, P+R Czerwone Maki, Plac Wolnica, Grzegórzki – Zabłocie bicycle bridge, and Długa & Słowackiego	**Monitoring Network**: Expanded to Dietla, Wielopole, Wrzesińska, and the Historic Centre (UNESCO).
Risks & Challenges	• **Aviation delays**: Authorisation bottlenecks from civil aviation authorities. • **Connectivity**: Temporary data transmission gaps during peak mobile network congestion.	• **Weather conditions**: Rain/wind thresholds disrupting scheduled drone flights. • **Data comparability**: Maintaining consistent mission parameters across the three study sessions.
Participants & Engagement	• **MobiLysis technical team** overseeing drone deployments. • **ZTP Kraków experts** complementing AI insights with field knowledge.	• **Volunteers** selected for the transport behaviour study. • **City planners** utilising data for long-term infrastructure interventions.
Timeline	Refer to Figure 6 for specific timelines.	

3.3. Malta-Gozo F-LL

Malta is an island state with a population of approximately 516,000, consisting of the main islands of Malta and Gozo. The islands face a critical challenge of high car dependency, with 97% of vehicles petrol- or diesel-powered, and public transport accounting for only a 9% modal split. Gozo, in particular, is characterised by its narrow, historic village cores and steep terrain, which make traditional fixed-route bus services appear inefficient and inflexible. Inspired by the on-demand automated pilot models demonstrated in Tampere and Limassol, the Gozo LL is focused on transitioning this heavily car-oriented system into a greener, multimodal network through the deployment of Malta's first automated public transport vehicle pilot, designed to adapt dynamically to passenger needs.

3.3.1. GM-UC01 - On-Demand Automated E-bus Services

This UC represents a landmark innovation as Malta's first automated public transport vehicle pilot. The project will deploy an innovative automated electric bus service designed to provide zero-emission mobility for both residents and tourists. While the pilot is designed for on-demand operations via the Tallinja app, service delivery is coordinated with a forthcoming legislative framework from Transport Malta (TM). This new regulation specifically addresses the operational standards for automated vehicles within the Malta-Gozo context. In alignment with these requirements, the service will feature an on-board safety driver to maintain compliance with established enforcement protocols and safety standards.

metaDesign & Preparatory Phase

These points focus on localised feasibility, technical validation of autonomous e-bus services, and advanced service simulation to ensure the pilot demonstrates an on-demand automated e-bus service across two routes to understand how this new service can be designed effectively and attract new users within the island context. Key activities during this phase included:

- **Co-Design and Stakeholder Alignment:**

Under metaDesign (LL1-LL5) activities, the Malta – Gozo Living Lab focused on:

  - clearly defining the use case through the active and continuous input from stakeholders. Meetings were held in both Gozo and Malta to discuss the demonstration, identify any potential issues, and incorporate their recommendations and feedback.
  - demonstrating strong local interest and collaboration potential. Stakeholders in both San Lawrenz and Kalkara emphasised the importance of effective communication, minimising disruption during infrastructure works, and maximising visibility of the project as an innovative and community-oriented pilot.

- **Selection of the Location:**

Malta-Gozo FLL partners selected several routes to test automated electric bus services, considering three initial criteria:

  - **Accessibility criteria:** Small, narrow village streets make it unsuitable for standard buses, but ideal for smaller autonomous shuttles.
  - **Economic Hub:** Smart City is a growing technology and employment centre, attracting daily commuters, shopping mall visitors and tourists.
  - **Community Value:** Serves local residents with sustainable, accessible mobility, especially for elderly users or those without cars.

- **Operational & Legislative & Infrastructural Planning:**

Progress was also made in establishing the legislation for the autonomous bus to operate during the demonstration period and the finalisation of the contract for the leased autonomous e-bus. This resulted in the following conclusions:

  - MPT needs to work in close consultation with MTIP/TM during the pilot.
  - Local councils, public organisations and the business community along the routes that will be involved in the pilot to support the use case and to allow for any required parking space for the bus during the night.
  - The autonomous routes need to be imported on the On Demand software managed inside the Tallinja App, including times of operation, bus stops and vehicle seating specifications.

- **Human Resource Preparation:**

Discussions underlined the importance of capacity building for the successful deployment of the UC, in particular:

  - On-board safety operators and other staff members are needed for managing the operation.
  - Operator and controllers need to be trained – personnel already working for the operator (MPT) can be used.
  - Enforcement officers within TM need to be trained on the legislative framework and to understand how this new technology works—particularly as new legislation

is finalised to enable Malta-Gozo operations—to support any traffic management-related actions required during the pilot while a safety driver remains on board.

Integration & Testing and Wide-scale Demonstration Phases

Table 6: Implementation Plan - GM-UC01 - On-Demand automated e-bus services

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• To showcase an innovative automated e-bus service designed to provide zero-emission mobility for residents and tourists on the islands of Malta and Gozo. • To gather feedback from residents and tourists via surveys, focusing on their expectations, experiences, satisfaction, accessibility, and suggestions for improvement to support system and service refinement. • To evaluate the autonomous bus's technical and operational performance and compatibility with local conditions and requirements.	• To pilot autonomous e-bus services on selected routes in Malta and Gozo under real-world operating conditions. • To evaluate public perceptions of safety associated with the autonomous bus. • To measure public awareness and acceptance of autonomous public transport. • To evaluate the autonomous bus's technical and operational compatibility with local conditions and requirements. • To assess the potential contribution of autonomous public transport to reduced reliance on petrol and diesel vehicles and lower local emissions
Technologies, Infrastructure & Services	• **Core Technology:** Deployment of one electric autonomous bus equipped with V2X-ready sensors and a suite of Lidar sensors for obstacle detection. To facilitate V2X communication, the manufacturer will adapt the local traffic lights to ensure connectivity with the autonomous bus if such modifications are deemed necessary during technical integration. • **Monitoring:** Configuration of remote monitoring via 4G/5G through the Malta Public Transport Control Centre. • **Energy:** Setup of portable charging stations in temporary depots to ensure a stable power supply. • **Booking:** Integration of an on-demand system into the operator's existing digital platform.	• **Autonomous Features:** The vehicle utilises a suite of high-precision sensors, including **360-degree multi-layer Lidars, GPS antennas, and cameras** for comprehensive obstacle detection. These sensors are planned for full integration with local traffic lights, a process currently under discussion with the manufacturer to determine if specific hardware modifications to the traffic light infrastructure are required. • **Connectivity:** Maintenance of 5G connectivity for real-time fleet supervision. • **Modifications:** Targeted upgrades to road markings, signage, and bus stop bays will be implemented only as necessary to ensure clear paths and obstruction-free docking for the automated shuttle.
Location	• **Gozo:** Għarb (Ta' Dbiegi Crafts Village) to San Lawrenz Church. • **Malta:** Loop around Smart City Malta technology hub and Esplora Interactive Science Centre.	Initial routes in Gozo and Kalkara with potential expansion of zones if service demand exceeds capacity during the pilot. Also, there will be a demo route in Ta' Qali Park for launching purposes.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Risks & Challenges	• **Operational Readiness:** Risks of longer-than-expected training/testing phases or lack of vehicle availability due to maintenance. • **Technical/Software:** Risks of vehicle charge depletion, software glitches, or lost connectivity affecting safety.	• **Acceptance:** Residents' complaints, public rejection of new tech, or vandalism of infrastructure. • **Regulatory/Legal:** Limited legal space for autonomous features, insurance availability, and bus supply chain delays.
Participants & Engagement	• **Authorities:** MTIP (Co-design lead) and Transport Malta (Legislation and Enforcement). • **Operator:** Malta Public Transport (MPT) for daily operation, training and vehicular data collection. • **Academic:** University of Malta for data collection and analysis.	• **Community:** Local and Regional Councils and organisations (e.g., band clubs, scouts) to attract users. • **Business:** Smart City, Esplora and Crafts Village business communities to promote the service. • **Target Groups:** Citizens and visitors.
Timeline	Refer to Figure 7 for specific timelines.	

3.4. Milan F-LL

Milan is actively working to meet the ambitious decarbonization targets set out in its CCC. The city faces a significant challenge in reducing car dependency and usage, particularly in peripheral areas within the Milan Metropolitan Area that are characterised by high car reliance and limited public transport options—typically categorised as having fewer than seven transit lines serving the district. Following the lead of Munich and Amsterdam in testing modular and flexible transport services, the Milan LL is focusing on enhancing the accessibility and attractiveness of the public transport network by introducing innovative ZESM solutions—specifically an on-demand e-pod service—designed to bridge connectivity gaps for both residents and local activity hubs.

3.4.1. MI-UC01 - Development of an On-Demand E-Pod Service Designed to Leverage the Improved E-pods Autonomous Features

This UC introduces an innovative zero-emission on-demand service that features a unique "on-board interchange" system. The service utilises a fleet of modular electric mini-vehicles (e-pods), developed by NeXT, which are capable of dynamically coupling and uncoupling while travelling along their routes. The core objective is to augment traditional DRT by allowing passengers to transition between vehicles internally through front doors present on each pod. This unique configuration enables a user to begin their journey in one vehicle and complete it in another without ever needing to step out onto the street, making the transfer seamless, more comfortable, and more efficient.

The service is managed via a technological platform powered by an optimisation algorithm that defines the most efficient routes and meeting points based on real-time user requests. By allowing pods to connect and share passengers dynamically, the system aims to satisfy a higher number of mobility requests using the same number of vehicles. Ultimately, this project seeks to increase the accessibility and attractiveness of public transport within the Milan Metropolitan Area, directly supporting the city's goals to reduce car dependency and pollutant emissions. The fleet for this pilot will consist of four vehicles, including one with a low-floor design to ensure full accessibility for wheelchair users.

metaDesign & Preparatory Phase

The preparatory phase for MI-UC01 focused on transitioning the modular e-pod concept into a locally viable service within the Milan Metropolitan Area. Key activities during this period included:

- **Service Simulation and Site Selection:** The project team is developing a service simulator to conduct scenario-based simulations, modelling demand and network conditions to determine the optimal implementation area among candidates such as Paderno Dugnano, San Donato Milanese, and MIND-C.na Merlata.
- **Technical Validation and Private Testing:** The technology provider, NExT, successfully conducted autonomous navigation tests in a private area, validating the e-pod's ability to perform throttling, steering, and braking while avoiding obstacles.
- **Administrative and Legal Readiness:** A critical focus was placed on vehicle type-approval; while the pods are provided with M1 approval (allowing stationary coupling), the team is actively pursuing M2 approval to authorise driving in a coupled configuration on public roads.
- **Digital Infrastructure Development:** Preparatory work began on enhancing the existing DRT application, with Factual tasked with integrating new functionalities to optimise interchange points between modular vehicles.
- **Algorithm and Safety Design:** Within the scope of WP2, NExT and the University of Naples Federico II collaborated on the algorithms managing coupling and uncoupling manoeuvres, ensuring these operations are safe for both passengers and pedestrians.
- **Resource Allocation and Training:** The phase included planning for upfront investments in personnel training, ensuring that drivers and service operators are equipped to manage the specialised technical requirements of the modular fleet.

Integration & Testing and Wide-scale Demonstration Phases

Table 7: Implementation Plan - MI-UC01 - Development of an on-demand e-pod service designed to leverage the improved e-pods' autonomous features

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Validate autonomous navigation capabilities (throttling, steering, and braking) in private areas. • Calibrate the service simulator to assess system performance under various configurations. • Test the on-board interchange workflow to ensure seamless passenger transitions between pods.	Achieve a 10% reduction in car dependency among residents within the pilot implementation area, and a 30% increase in perceived public transport accessibility among registered service users, improving accessibility for mapped vulnerable groups within the service zone by 20%.
Technologies, Infrastructure & Services	• IoT sensors and real-time monitoring for precise alignment during docking. • Testing of Level 4 autonomous features, including docking, summoning, and parking. • Updates to the DRT platform to support modular interchange points.	• Fleet of three electric e-pods, and one vehicle with a low-floor design for wheelchair accessibility. • Optimisation algorithms for dynamic routing and real-time meeting point assignment.
Location	• Private testing sites (e.g., parking lots) for technical docking manoeuvres. • Digital simulation environment for scenario-based network modelling.	Implementation within the Milan Metropolitan Area, with candidate sites including Paderno Dugnano, San Donato Milanese, MIND-C.na Merlata, and other suburban communes characterised by having limited accessibility.

Co-funded by the European Union

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Risks & Challenges	• **Platform crash**: High-severity risk requiring system redundancy to recover state. • **Vehicle breakdown**: Risk requiring a management plan to operate with a reduced fleet.	• **Type-approval**: Potential restriction to stationary coupling if M2 approval for coupled driving is not obtained. • **User Acceptance**: Low level of acceptance regarding the new service model.
Participants & Engagement	Technical and planning collaboration involving **Agenzia TPL, AMAT, NeXT, and Factual**, supported by academic partners from the University of Naples and Milan-Bicocca for monitoring and impact assessment.	• **Selected PTO**: Responsible for daily operation and wheelchair accessibility. • **Users**: Citizens, students, and vulnerable groups testing the service. • **UTP Association**: Representing user needs and feedback. • **Local Media**: Awareness and engagement dissemination.
Timeline	Refer to Figure 8 for specific timelines.	

3.5. Miskolc F-LL

Miskolc is a city in Hungary focused on enhancing the interoperability and coordination of its public transport network, which includes buses, trams, and micromobility. A significant challenge within the city's current system is that existing transport hubs do not provide sufficient spatial or temporal integration between micromobility options, such as bikes and scooters, and traditional public transport. By localising the multimodal integration strategies and digital passenger information frameworks established in the Trailblazer cities of Tampere and Munich, the Miskolc LL is working to reduce private car dependency—which stood at 45% in 2016—by creating a more connected urban ecosystem that prioritises user-friendly, zero-emission mobility solutions.

3.5.1. MK-UC01-A - Multimodal Passenger Hub

The primary goal of this part of the UC is to transform an existing public transport junction into an integrated multimodal mobility hub. This hub will provide a unified physical and digital infrastructure that connects buses, trams, and private transport with micromobility options like bikes and scooters. Unlike traditional hubs that operate as separate systems, this pilot focuses on seamless integration to make sustainable travel more practical and attractive. The hub will serve as a multimodal information point, offering real-time updates on public transport schedules and essential guidance on various transport options. Key physical innovations include the installation of bike racks, urban furniture, and digital passenger information displays. Additional infrastructure may include surveillance cameras and USB chargers with solar panels, measurement of temperature and air pollution. The pilot is strategically located at the Tapolca junction (Tapolca elágazás), a vital link between the city centre and major tourist attractions, with the Bagolyvár area identified as a backup site. By streamlining access to multiple modes in one accessible location, the project aims to reduce private car dependency (which stood at 45% in 2016), improve system efficiency, and foster a connected urban ecosystem prioritised for user-friendly, zero-emission mobility.

metaDesign & Preparatory Phase

The preparatory phase for the first Miskolc UC focused on the physical and digital requirements for the multimodal passenger hub. Because the technical prototype lists more than five key preparatory activities, they are summarised below:

- **Strategic Site Selection:** The Tapolca junction (Tapolca elágazás) was selected as the primary location due to its high passenger volumes and its status as a vital link between the city centre and major tourist destinations; additionally, the Bagolyvár area was designated as a backup site to mitigate potential permitting or power supply risks.
- **Stakeholder and Role Definition:** The phase included mapping the responsibilities of project partners, including MVK for transport infrastructure, the Municipality of Miskolc for land use, Lime for micromobility data, and HC Linear for the operation of digital information systems.
- **Technical Integration Planning:** Partners planned the digital infrastructure required to connect the hub's visual information system with real-time data from public transport timetables (GTFS) and micromobility status feeds (GBFS) via the MobilON system.
- **Physical Component Specification:** Detailed planning was conducted for the installation of bike racks, urban furniture, and digital displays, as well as the provision of electricity and internet connectivity for the hub.
- **Financial and Resource Allocation:** Budgetary arrangements were finalised for digital equipment from project funds and for street furniture from MVK internal funds.
- **Maintenance and Training Strategy:** The LL determined that the maintenance of the new infrastructure would be managed through the training of existing staff, ensuring operational sustainability without external hiring costs.
- **Risk Mitigation Readiness:** Preparatory activities involved early coordination with the city's legal department and utility providers to address potential regulatory changes or electricity outages, including the planning of potential backup battery systems.

Integration & Testing and Wide-scale Demonstration Phases

Table 8: Implementation Plan - MK-UC01-A - Multimodal passenger hub

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Reduce private car dependency to support CCC goals. • Integrate micromobility physically at hubs and digitally via the journey planner. • Enhance user experience through real-time transfer info at hub screens. • Expand hub functionality with new components like bike racks and urban furniture. • Increase the volume of micromobility devices at the smart hub by 2027.	• Achieve a measurable reduction in the 45% car modal share baseline. • Maintain high data accuracy for info screens during the pilot. • Deliver emission savings data to users to promote sustainable travel choices.
Technologies, Infrastructure & Services	• **Physical:** Installation of bike racks, urban furniture, and solar-powered USB chargers. • **Digital:** Connecting the MobilON system to GTFS public transport feeds and GBFS micromobility data. • **Monitoring:** Deployment of environmental data monitoring and potentially surveillance cameras.	• Full deployment of digital info screens with automatic night-time shutdown to prevent light pollution. • Integration of meteorological and intercity bus APIs (if provided) for comprehensive travel planning. • Emission summaries displayed directly at the hub.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Location	• **Primary Site:** Tapolca junction (Tapolca elágazás), a high-traffic link for tourists and residents. • **Backup Site:** Bagolyvár area, intended to mitigate power supply or permit risks.	Live operation within the administrative area of Miskolc and the wider MVK network.
Risks & Challenges	• **Technical:** Risks of electricity outages or loss of data connection to the screens. • **Mitigation:** Use of backup batteries and temporary offline messaging for passengers. • **External:** Challenges with citizen acceptance and potential traffic lane expansions.	• **Sustainability:** Addressing vandalism through surveillance and coordination with the legal department. • **Operational:** Managing language barriers for tourists via the digital interface. • **Data:** Ensuring ongoing data pipeline integrity through HC Linear.
Participants & Engagement	• **Operations:** MVK handles bus/tram management and hub cleanliness. • **Tech:** HC Linear manages the digital data pipeline and troubleshooting. • **Infrastructure:** Lime provides micromobility data; local utilities supply power and internet. • **Regulatory:** The Municipality of Miskolc oversees permitting and land use.	• **Users:** Local citizens and tourists provide feedback via the app to optimise services. • **Staff:** Existing MVK staff will undergo training for infrastructure maintenance.
Timeline	Refer to Figure 9 for specific timelines.	

3.5.2. MK-UC01-B - Multimodal Journey Planner

The primary goal of this digital innovation is to enhance Miskolc's mobility ecosystem by transforming the current local journey planner into a sophisticated multimodal route planner integrated within the MobilON application. This pilot addresses a key gap in the city's transport system: while various modes of transport exist, users often struggle to plan efficient trips that combine them into a single journey. The core innovation lies in the use of AI-based optimisation algorithms and utility-based calculations to optimise activity chains. Unlike basic scheduling tools, this planner empowers users to customise their travel parameters based on personal priorities, such as travel time, cost, CO2 emissions, and even personal health effects. By prioritising sustainability in travel planning, the system encourages users to choose options with a lower environmental footprint or those that are more beneficial for their physical health. Technically, the application integrates real-time data from GTFS and GBFS, specifically through a partnership with Lime to provide the location, capacity, and battery status of e-scooters. Available throughout the administrative area of Miskolc, the multimodal journey planner aims to simplify complex decision-making and foster the adoption of green transport alternatives, directly supporting the city’s goals to reduce private car dependency and achieve climate neutrality

metaDesign & Preparatory Phase

The preparatory phase for the Multimodal Journey Planner focused on the digital architecture, data integration, and algorithmic design required to support AI-driven trip optimisation. Key activities during this period included:

- **AI Algorithm Development:** BME spearheaded the development of the multimodal journey planning algorithm, which utilises artificial intelligence to perform activity chain optimisation and utility-based calculations based on user preferences.
- **Application Extension:** HC Linear worked on renewing and extending the existing MobilON application, transforming it from a basic public transport information tool into a comprehensive platform capable of visualising multimodal routes.
- **Data Partnership and Integration:** A vital component of this phase was preparing a cooperation agreement with Lime, ensuring that the system could ingest real-time GBFS feeds to provide data on e-scooter locations, capacity, and battery status.
- **Technical Capacity Building:** The project team leveraged the preparatory period to train existing staff on the new planner module, strengthening internal technical competencies to ensure future maintenance and expansion can be handled without external hiring.
- **Data Standardisation:** Technical efforts ensured the application's compliance with GTFS and GBFS standards, facilitating a seamless handshake between public transit schedules and micromobility service data.
- **Research Framework Design:** Partners, led by BME, designed user surveys and utility models to capture baseline transport behaviours and prepare for the evaluation of user acceptance during the pilot.
- **Infrastructure Preparation:** While the system leverages existing digital assets, the phase included planning for the necessary dedicated server environments and IT back-end systems required for high-performance live operations.

Integration & Testing and Wide-scale Demonstration Phases

Table 9: Implementation Plan - MK-UC01-B - Multimodal journey planner

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Validate AI algorithms for activity chain optimisation and utility-based calculations. • Test digital connections between the MobilON app and GTFS (public transit) and GBFS (micromobility) data feeds. • Evaluate the accuracy of personalised travel recommendations.	Achieve a reduction in private car dependency, increase the number of registered users for the MobilON app, and provide data on CO2 emissions, costs, and health impacts to influence sustainable travel choices.
Technologies, Infrastructure & Services	• **Digital:** AI optimisation models, MobilON app extension, and real-time data ingestion pipelines. • **Monitoring:** Data analytics to track user registration and trip planning frequency.	• **Physical:** Dedicated server environments and high-performance IT backend systems established by the client. • **Integration:** Full integration with Lime e-scooter data and MVK public transport systems.
Location	• **Digital Environment:** Testing within the MobilON app infrastructure and internal server environments. • **Operational Area:** Tested across the wider MVK network coverage.	Available across the entire administrative area of Miskolc and the operational area of the public transport operator, MVK.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Risks & Challenges	• **Connection Failure:** High-severity risk of losing contact with external data sources. • **Server Outage:** Potential for system downtime requiring 24/7 supervision and backup servers.	• **User Retention:** Risk of high dropout rates if routing recommendations do not build user trust. • **App Store Review:** Potential delays or rejections during the publication process due to compliance issues.
Participants & Engagement	Technical collaboration between HC Linear (app development) and BME (algorithm design and data analysis), supported by MVK for transport network integration.	• **Lime:** Providing real-time micromobility status data (location, battery status). • **Users:** Registered citizens and commuters providing feedback on trip optimisation and system performance.
Timeline	Refer to Figure 9 for specific timelines.	

3.6. Poissy, Yvelines (Paris Region) F-LL

Poissy is located in the Yvelines department (CD78) of the Île-de-France region, situated north-west of Paris. The commune has a population of nearly 40,000 residents and serves as a significant hub for automotive manufacturers and technology companies. The LL is centred around the Poissy rail station, a major multimodal hub that attracts more than 10 million passengers annually and provides connections to 14 bus lines and two major rail lines (RER A and Transilien J). This lab acts as a service layer that builds upon the intelligent infrastructure and V2X technology models pioneered in the Trailblazer cities of Munich and Limassol. By localising these advancements, the city addresses critical challenges regarding traffic congestion and safety in the station's vicinity, focusing on the development of Intelligent Transportation Systems and shared vehicle services to reduce private car dependency.

3.6.1. PO-UC01-A - Intelligent Road and Smart Traffic Management

The first part of the UC for Poissy, Yvelines (Paris Region) serves as the technical foundation for a real-time supervision system designed to manage a smart mobility hub. The primary innovation is the creation of a fully intelligent road equipped with V2X technologies, including V2V and V2I protocols. By deploying Roadside Units (RSUs), computer vision capabilities, and multi-technology mobility sensors (such as Bluetooth), the city aims to optimise traffic performance, reduce delays at major roundabouts, and enhance overall safety. A key component of this pilot is the utilisation of drone swarms to collect high-resolution video data from traffic streams, which allows for trajectory-based monitoring to detect congestion and improve infrastructure interoperability. The implementation is structured in two main phases:

- **Phase 1:** Equipping existing sections of the road with V2X-ready sensors, cameras, and connectivity infrastructure (LTE/5G).
- **Phase 2:** A full redesign of the road to integrate new services such as Bus Rapid Transit (BRT) and advanced perception systems from the infrastructure.

In more detail, the Phase 2 will focus on a redesign of the road's digital infrastructure system (access to and from mobility hubs) that enables integrating new services such as BRT (To be constructed in 2028-2030) or connected vehicles (such as future shared mobility or automated mobility solutions) supported by advanced perception systems from the infrastructure designed in Phase 1. PO-UC01-A seeks to provide the data and information necessary to support a connected urban ecosystem, targeting specific KPIs such as improved throughput at roundabouts, reduction of traffic conflicts, and air quality improvement.

metaDesign & Preparatory Phase

The preparatory phase for the Intelligent Road and Smart Traffic Management UC in Poissy, Yvelines (Paris Region) focused on establishing the technical and regulatory framework for a connected urban ecosystem. Key activities included:

- **Strategic Site Surveys and Mapping:** Partners conducted early site surveys to identify optimal installation points for RSUs, sensors, and V2X equipment along the primary road axes, D190 and D308, while coordinating with local authorities for space allocation.
- **Partner Responsibility Mapping: VEDECOM** was designated as the lead for the physical and digital layers, Floware for the deployment of traffic sensors and computer vision, and Mobilysis for the drone-based aerial monitoring framework.
- **Regulatory and Legal Alignment:** A critical component involved early engagement with regulatory authorities, facilitated by the Department of Yvelines (CD78), to obtain authorisations for infrastructure modifications and ensure compliance with upcoming regulations for automated transport.
- **Technical Architecture Design:** The phase focused on designing the V2X communication architecture (V2V and V2I protocols), establishing the Multi-access Edge Computing gateway, and planning the deployment of LTE, 5G, and NR-V2X connectivity to minimise latency.
- **Stakeholder and Social Acceptance Strategy:** Using the metaDesign framework (LL1–LL5), the project team addressed potential citizen hesitancy toward automated vehicles and connected services through a user-centric design approach and planned communication regarding data privacy and security.
- **Risk Identification and Mitigation Planning:** Preparatory workshops identified high-severity risks, such as insufficient space for hardware, network coverage gaps, and power supply instability, leading to the development of mitigation strategies like temporary masts and UPS systems for sensors.
- **Financial and Resource Allocation:** Budgetary arrangements were finalised, including a significant EU contribution for technical partners (e.g., over €787,000 for VEDECOM) and in-kind contributions from Mobilysis for drone operations and aerial data analysis.

Integration & Testing and Wide-scale Demonstration Phases

Table 10: Implementation Plan - PO-UC01-A - Intelligent Road and Smart Traffic Management

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Demonstrate the impact of V2V and V2I technologies on traffic performance. • Test multi-technology mobility sensors (Bluetooth, computer vision). • Collect data from drone swarms and sensors to develop AI models.	• Create a fully intelligent road with integrated V2X-ready sensors and cameras. • Achieve measurable improvements in throughput at roundabouts. • Target specific KPIs: reduction of traffic delays/conflicts and air quality improvement.
Technologies, Infrastructure & Services	• **Physical:** Connected fleet (3 conventional EVs, 1 automated vehicle) and drone swarms for video data collection.	• **Communication:** Full utilisation of LTE, 5G, and New Radio V2X (NR-V2X) for ultra-low latency.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	• **Digital:** Deploy Telematic Control Units on vehicles and an advanced V2X Gateway on Multi-access Edge Computing. • **Monitoring:** Initial integration of IoT traffic sensors on road segments D190 and D308.	• **C-ITS Services:** Cooperative Awareness and Collective Perception for infrastructure interoperability. • **Charging:** Implementation of automated inductive/wireless charging solutions.
Location	Poissy rail station vicinity and main road axes D190 and D308.	Extension to neighbouring cities Carrières-sous-Poissy and Triel-sur-Seine.
Risks & Challenges	• **Technical:** Risks of insufficient space for RSUs and power supply instability. • **Mitigation:** Use of temporary masts for suboptimal angles and UPS systems for sensor equipment.	• **External:** Potential delays in authorisations for infrastructure modifications and citizen hesitancy toward AVs. • **Mitigation:** A user-centric design approach and early coordination with the Department of Yvelines (CD78).
Participants & Engagement	• **Technical Leads:** VEDECOM (digital/V2X layer), Floware (traffic sensors), and Mobilysis (drones). • **Sponsors:** CD78 and Ville de Poissy providing regulatory support.	Involvement of citizens, students, and vulnerable groups (elderly/disabled) in co-creation workshops to ensure social acceptance.
Timeline	Refer to Figure 10 for specific timelines.	

3.6.2. PO-UC01-B - Shared Vehicle Services for Enhanced Mobility

The second part of the UC for Poissy, Yvelines (Paris Region) operationalises the metaCCAZE framework by testing the integration of shared electric and automated vehicle services with real-time supervision and predictive analytics. This pilot acts as the service layer that builds upon the "intelligent road" infrastructure established in PO-UC01-A, transforming traditional carpooling and on-demand transport into a connected, adaptive mobility system. The core of the service is a smart mobility hub that orchestrates a fleet of three conventional EVs and one automated vehicle. The system utilises an AI-based demand prediction engine to anticipate trip requests and dynamically reallocate the fleet to meet user needs in real-time. Users interact with the service via a passenger app, where they enter their destination and receive instant matches for driver ETAs and vehicle details. To specifically encourage a modal shift and incentivise shared mobility, rides provided through this service are completely free for passengers during the project period. The pilot is deployed at Hub A (Gare de Poissy) and Hub B (Gare de Triel-sur-Seine), covering the Poissy multimodal hub and the primary road axes of D190 and D308. By bridging the gap between vehicle-centric services and infrastructure intelligence, PO-UC01-B aims to reduce traffic congestion near the Poissy rail station—which currently handles over 10 million passengers annually—while supporting the city's broader goals for decarbonisation and sustainable multimodality.

metaDesign & Preparatory Phase

The preparatory phase for the Shared Vehicle Services for Enhanced Mobility in Poissy, Yvelines (Paris Region) focused on the operationalisation of the service layer, bridging the gap between vehicle-centric technologies and the "intelligent road" infrastructure. Key activities during this period included:

- **Digital Orchestration Design:** VEDECOM led the design and development of the mobility orchestration platform (Smart Hub) and the transformer-based demand prediction engine, which enables proactive anticipation of trip requests and dynamically reallocate the fleet.
- **Stakeholder and Social Inclusion:** Following the metaDesign framework (LL1–LL5), the project team conducted co-creation workshops that specifically targeted vulnerable groups, including the elderly and people with reduced mobility, to ensure the shared service addresses existing mobility gaps.
- **Regulatory and Policy Alignment:** The Department of Yvelines (CD78) acted as a facilitator to coordinate with territorial actors and secure necessary authorisations for pilot operations, ensuring the service aligns with local policies and the city's sustainable transport goals.
- **Infrastructure Synergy:** Partners planned the integration between the shared fleet and the connected infrastructure from PO-UC01-A, including the allocation of V2X-ready sensors and cameras at the designated Poissy and Triel-sur-Seine hubs.
- **Technical Fleet Preparation:** This phase involved the selection and technical preparation of the connected fleet, consisting of three conventional EVs and one automated vehicle, including the development of rapid automated charging procedures.
- **Marketing and Communication Strategy:** By Month 14, the team developed localised marketing strategies to build community trust and prepare for a high level of uptake once the free demonstration begins.
- **Data and Risk Planning:** Technical partners, including Floware and Mobilysis, established protocols for drone-based data analysis and sensor calibration to feed real-time traffic information into the carpooling platform.

Integration & Testing and Wide-scale Demonstration Phases

Table 11: Implementation Plan - PO-UC01-B - Shared Vehicle Services for Enhanced Mobility

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
Objectives & Scope	• Validate the integration of shared electric and automated vehicle (AV) services with real-time supervision. • Test the AI-based demand prediction engine for dynamic vehicle allocation.	Transform traditional carpooling into a connected, adaptive mobility system to reduce traffic congestion near the Poissy multimodal hub and support city-wide decarbonisation goals.
Technologies, Infrastructure & Services	• **Digital:** Mobility orchestration platform (Digital Hub) and AI demand prediction algorithms. • **Physical:** Connected fleet consisting of 3 conventional EVs and 1 automated vehicle.	• **Infrastructure:** Dedicated carpooling/e-shuttle stops and parking zones equipped with smart parking sensors. • **Services:** Real-time vehicle diagnostics and safety analytics integrated via V2X protocols.
Location	Deployment at Hub A (Ville de Poissy) and Hub B (Gare of Triel-sur-Seine).	Operation across the Poissy multimodal hub and the primary road axes D190 and D308.
Risks & Challenges	• **Prediction Error:** Risk of AI demand prediction inaccuracy, leading to poor trip forecasting and inefficient allocation. • **Technical Failure:** Potential software compatibility issues or hardware	• **Social Acceptance:** Risk of low perceived value where users do not see benefits over existing travel options. • **Competition:** Pressure from existing commercial taxi or ride-hailing services.

	INTEGRATION & TESTING PLAN	WIDE-SCALE DEMONSTRATION PLAN
	failure of sensors and charging systems.	
Participants & Engagement	Technical orchestration by VEDECOM (fleet/platform management), supported by Floware and Mobilysis for real-time sensor and drone data analysis.	• **Public Support:** Department of Yvelines (CD78), providing the regulatory framework. • **End Users:** Passengers encouraged to use the service via completely free rides during the project period.
Timeline	Refer to Figure 10 for specific timelines.	

3.7. Local communication and marketing strategies

The six F-LLs: Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region), have established localised communication frameworks designed to transition metaInnovations from Trailblazer concepts to real-world social acceptance. These strategies, finalised by 30 September 2025, are specifically tailored to each city's unique socio-economic, regulatory, and infrastructural conditions.

The purpose of these local strategies is to build awareness for specific mobility technologies, foster broad stakeholder participation, and use storytelling to share success stories that strengthen public support for shared, zero-emission mobility. By employing the Quadruple Helix model (engaging public authorities, industry, academia, and civil society), the labs aim to synchronise technical deployment with societal needs, ensuring that innovative solutions like automated shuttles or demand-responsive platforms are not only technically sound but also socially accepted and politically supported.

3.8. Coordination Overview

The coordination of local communication and marketing for the F-LLs is managed centrally to ensure that all city-specific efforts remain aligned with the overarching project goals while allowing for local flexibility. These points summarise the coordination framework established for these strategies:

- **Central Leadership and Support:** The project's communication and dissemination leaders provide the structured support necessary for the F-LLs. This includes offering direct assistance for the development of graphic materials, the creation of localised "punchlines," and general strategic guidance to ensure all local content correctly recognises EU funding and the metaCCAZE corporate identity.
- **Standardised Tools:** To maintain consistency, each city was required to complete a Local Communication Strategy Template and a shared Excel Gantt chart by September 30, 2025. These tools were designed to help cities plan and coordinate outreach activities across their specific contexts while adhering to the same structural framework.
- **Strategic Alignment:** Every local strategy must align with the primary metaCCAZE Dissemination & Communication Strategy (D5.1) by adopting a unified methodological approach. Strategic alignment focuses on the consistent application of similar tools and engagement methods—such as standardised stakeholder mapping and co-creation frameworks—across all LLs to ensure a comparable and scalable implementation of metaInnovations.

- **Timeline and Task Management:** Coordination is supported by a shared Gantt chart that provides a visual timeline of activities from July 2025 (Month 19) to December 2027 (Month 48). This chart details specific tasks and responsibilities, ensuring that outreach is synchronised during the critical Integration, Testing, and Wide-scale Demonstration periods.
- **Local Team Structure:** To manage these efforts effectively at the city level, each lab has established a Local D&C Team. These teams, which include representatives from various partner organisations, are encouraged to hold (bi-)monthly meetings to delegate tasks, discuss progress, and prepare for upcoming local events.
- **Continuous Feedback Loop:** The central team maintains an open line of communication for technical or creative support. This coordination ensures that while each city addresses unique urban or mobility challenges, the collective project narrative remains coherent and impactful.

3.9. Summary of Local Communication Strategies

Table 12: Summary of Local Communication Strategies for Follower Living Labs

Living Lab	Local Punchline (English)	Primary Target Audience	Main Communication Channels
Athens	**"Athens is charging up — electric buses, clean air, zero emissions"**	Institutional stakeholders (OASA, OSY) and daily public transport users.	OASA/Municipality websites, academic sessions at NTUA, and local radio.
Kraków	**"metaCCAZE Kraków – smart logistics for fresh air"**	Local entrepreneurs (shops/restaurants), courier companies, and UNESCO zone residents.	ZTP/Municipality websites, Facebook, and local radio broadcasts.
Gozo (Malta)	**"Driving Innovation on Malta's Roads"**	Local residents, commuters, tourists, and Malta Public Transport.	Ministry/University websites, social media, and printed postcards/family quizzes.
Milan	**"FRIMBO – Flexible, Responsive, Intelligent Mobility for Better Outcomes"**	Citizens, students, workers in implementation areas, and the media.	AMAT/Municipality websites, newsletters, and flyers at service stops.
Miskolc	**"Journeys designed for you – next stop: the future!"**	Residents, commuters from the agglomeration, and tourists.	MVK website/Facebook page and the MobilON journey planner app.
Poissy, Yvelines (Paris Region)	**"metaCCAZE Poissy, Yvelines (Paris Region)– Towards smart, integrated, and carbon-free mobility"**	End-users of mobility hubs, long-distance commuters, and regional transport agencies.	Yvelines Department website, LinkedIn, and on-site consultations.

3.10. City Specific Profiles

The following summaries detail the localised communication and marketing strategies for each F-LL, emphasising their specific messaging, target audiences, and strategic priorities.

Athens

The strategy focuses on building public trust by demonstrating how new technologies balance service quality with operational constraints. The purpose is to showcase coordinated efforts between stakeholders to seamlessly integrate new solutions into the existing urban network. Key goals include integrating these concepts into university-level transportation curricula and establishing a two-way communication channel between technical innovators and the public to ensure a continuous feedback loop. The communication team is led by NTUA, which manages technology presentations, while OASA and Anaplassis S.A. coordinate organisational dissemination. This approach addresses the city's persistent congestion and the need to modernise a fleet that spans one of the largest urban networks in Europe.

Kraków

Kraków's strategy utilises storytelling to build trust and inspire the replication of new delivery models within restricted urban zones. The primary purpose is to promote an understanding of innovative technologies and ensure that mobility solutions reflect the needs of local businesses operating under access restrictions. A central priority is to increase digital reach and boost user adoption through heavy participation in city launch events. The Public Transport Authority in Kraków (ZTP) leads the local PR efforts. Strategically, the plan addresses the conflict between the operational rhythms of small businesses and municipal regulations intended to protect the city's UNESCO-protected heritage.

Malta-Gozo

The strategy for Malta-Gozo is built on ensuring that innovation is socially accepted and locally relevant. It focuses on demystifying new technologies to reduce scepticism and uses user testimonials to highlight tangible benefits. Strategic goals include collecting extensive citizen feedback for academic research and increasing engagement through co-design workshops and university presence. The University of Malta is responsible for scientific publications and research updates, while the Ministry for Transport (MTIP) and Malta Public Transport (MPT) oversee implementation logistics and materials. This strategy is tailored to a small island context facing high reliance on private cars and significant seasonal tourism pressure.

Milan

Milan's communication intent is to raise interest in zero-emission mobility by making the technology tangible through physical visibility and trials. The strategy aims to inform the community about service characteristics and booking procedures to drive immediate demand. Outreach is designed to complement the city's SUMP by highlighting how new services connect underserved areas and improve accessibility. The communication team at AMAT manages networking, digital content, and external events. This effort addresses Milan's need for a more inclusive and adaptable urban mobility ecosystem.

Miskolc

The strategy in Miskolc positions citizens as "co-designers," emphasising that their feedback directly shapes the final services. The purpose is to increase confidence in public transport by showing that planning goes beyond time-based optimisation to include health, cost, and emission factors. Goals include monitoring digital uptake and collecting continuous feedback at smart transport hubs. The team at MVK consists of customer liaison officers who manage interactions with both the public and consortium partners. This approach supports the city's strategic goal of reducing car use and improving urban liveability in alignment with EU digital transition guidelines.

Poissy, Yvelines (Paris Region)

The Poissy, Yvelines (Paris Region) strategy focuses on creating awareness among local authorities regarding traffic flow monitoring and management. Its purpose is to build a collaborative foundation and a structured framework for the governance of mobility hubs to ensure they do not remain mere pilots but become transferable models. Strategic goals include fostering cooperation between complex management hierarchies (such as RATP and IDFM) and validating scientific models with research partners. The project management unit within the Department of Yvelines leads the team alongside R&D leads from VEDECOM and Floware. This strategy responds to massive urban transformations and new passenger flows that require a digital-smart foundation for traffic coordination.

4. Monitoring Plan

This chapter defines the structured approach for tracking the implementation, performance, and impact of metaCCAZE UCs during the integration and demonstration phases. By aligning F-LL monitoring with the SIEF, the project ensures a "common language" for evaluating zero-emission shared mobility across diverse urban contexts. The following sections detail how this framework bridges high-level technical designs with localised execution to provide the evidence base required for the project's final impact assessment.

4.1. Monitoring Objectives and Scope

The monitoring activities within the F-LLs serve as the primary mechanism for transitioning from theoretical planning to operational evidence. This phase is designed to systematically track the progress, performance, and impact of metaCCAZE UCs as they move through integration, testing, and wide-scale demonstration. The scope of these activities covers all UCs implemented across the six Follower Living Labs: Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region), focusing on the following core objectives:

- **Implementation Tracking:** Monitoring the progress of each UC against the planned milestones and localised timelines defined in the Annexe Gantt charts.
- **Harmonised Data Collection:** Gathering consistent data across all technical, operational, and environmental impact dimensions to allow for cross-city comparison.
- **Social Acceptance Assessment:** Measuring user experience and citizen engagement through standardised survey instruments to evaluate the "social embracement" of new mobility services.
- **Transferability Validation:** Documenting the specific adaptation strategies and contextual conditions of each city to support the Transferability Potential Assessment.
- **Evidence-Based Reporting:** Providing structured qualitative and quantitative inputs for the impact evaluation and lessons learned analysis that will be reported in Deliverable D4.3.

This dual-layered scope ensures that while each city maintains the flexibility needed to address local administrative or legal constraints, the resulting data remains fully aligned with the project's global evaluation standards.

4.2. Monitoring Framework and KPIs

The monitoring framework for the F-LLs is built upon the project's universal "benchmark"—the SIEF. By utilising the final KPIs and data collection protocols refined during the LL5 metaDesign activities and also documented in the D1.5, the project ensures that monitoring remains consistent across all city cohorts. This unified framework allows for a "digital handshake" between local city data and the project-wide assessment tools, ensuring that technical and social metrics are directly comparable between Trailblazer and Follower implementations.

The KPIs are categorised into four distinct pillars to capture the multifaceted impact of the meta-innovations:

- **Technical and Operational Performance:** This category focuses on service reliability, utilisation rates, and energy efficiency. It specifically tracks whether the transferred technologies meet the technical thresholds defined in the initial blueprints, such as specific battery performance or automated scheduling accuracy.
- **Environmental Impact:** These indicators measure the contribution toward zero-emission goals. This includes pulling data for energy consumption and localised carbon emission reductions, ensuring these are calculated using the same methodology applied in previous project phases.
- **Social and User Acceptance:** Beyond technical success, the framework evaluates "social embracement" through social KPIs. These include standardised survey instruments designed to measure citizen satisfaction, accessibility for diverse demographics, and overall perceived value of the new services.
- **Governance and Transferability:** This pillar captures the organisational and regulatory factors that influence deployment. It monitors administrative milestones, such as the successful acquisition of municipal permits, and documents the legal adaptation strategies required for real-world scaling.

To maintain technical integrity, all monitoring data must adhere to the Common Data Environment rules. This ensures that every entry—from vehicle operations to survey results—is ingested into the project backend in a standardised format, facilitating seamless cross-city comparison and milestone validation.

4.3. Data Sources and Data Collection Methods

Consistent with the monitoring logic applied in the Trailblazer cities, data collection for the F-LLs relies on a multi-source approach. This ensures that the evaluation is grounded in both quantitative operational metrics and qualitative human experiences. By integrating automated data with human-centric insights, the project can perform a comprehensive "before-and-after" comparison to validate the impact of the meta-innovations. The four primary sources that the data collection is structured around are:

- **Automated Operational Data:** This includes real-time telemetry and logs generated directly by the demonstrated services. Key data points include vehicle operations, charging station activities, and system usage metrics, which provide an objective measure of technical performance.
- **Digital Tools and Local Platforms:** Data will be extracted from the specific digital ecosystems deployed in each LL, such as municipal traffic management systems or local mobility apps. These tools act as the primary interface for tracking service reliability and system availability.
- **Survey-Based Social Data:** To measure the human element of the transition, cities will deploy standardised "Social Embracement Surveys." These instruments target user experience, social acceptance, and behavioural change, ensuring that the qualitative impact on citizens is measured with the same rigour as technical data.
- **Qualitative Stakeholder Inputs:** Continuous feedback will be gathered from LL coordinators and key local partners. This information is vital for documenting the "contextual narrative", the specific administrative or legal hurdles encountered, and the adaptation strategies used to overcome them.

To ensure a meaningful evaluation, baseline data will be clearly defined and captured prior to the full-scale demonstration launch. This baseline serves as the reference point against which all performance and environmental gains, such as carbon emission reductions and energy efficiency, are measured, providing the empirical proof needed for the project's final results.

4.4. Monitoring Roles and Coordination

To ensure methodological consistency and high data quality, monitoring responsibilities are distributed across a three-tier governance structure. This hierarchy follows the established logic of the project, ensuring that local city insights are effectively scaled up to the consortium level while maintaining clear lines of accountability for data validation and technical alignment. They are organised as follows:

- **Local Level (F-LLs):** Each Follower city acts as the primary custodian of its data. Local coordinators are responsible for the hands-on collection, preliminary validation, and formatting of monitoring inputs related to their specific UCs. This ensures that the data reflects the "real-world" operational context of the city.
- **WP4 Coordination Level (BABLE):** The WP4 leadership provides the management oversight required to harmonise activities across all six cities. This level ensures that monitoring timelines, reporting formats, and administrative milestones are synchronised, preventing fragmentation between different LLs.
- **Evaluation and Transferability Level (NTUA & TRT):** Acting as the technical "anchor," the National Technical University of Athens coordinates the consolidation of all monitoring inputs. In close collaboration with TRT, they provide the methodological guidance necessary for cross-city evaluation. This includes refining KPI definitions and ensuring that social embracement surveys are implemented consistently across the entire consortium.

Continuous alignment is facilitated through regular WP4 meetings and the Cross-Fertilisation & Transferability engagements. These platforms serve as the primary venue for discussing monitoring challenges and sharing "lessons learned" in real-time. Additionally, dedicated workshops will be organised during the early demonstration phase to support cities in the practical application of the SIEF and to troubleshoot any technical barriers in the data collection process.

4.5. Reporting and Link to Impact Evaluation

The outputs generated through the monitoring of F-LLs serve as the primary evidence base for the project's final summative assessment. All data collected, ranging from technical performance logs to social acceptance metrics , is systematically documented to ensure a seamless transition from localised demonstration to global impact evaluation. This structured reporting approach ensures that the "lessons learned" during the deployment phase are captured as actionable insights for future urban mobility scaling.

The monitoring results will be consolidated and reported within Deliverable D4.3 (Impact Evaluation and Lessons Learned), focusing on the following core components:

- **Validated KPI Datasets:** Comprehensive quantitative data covering technical, environmental, and operational performance, allowing for a final comparison against the project's baseline targets.
- **Contextual Adaptation Narrative:** Documentation of the specific administrative, legal, and social "reality checks" encountered by each city, providing a qualitative understanding of the adaptation measures taken.

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- **Transferability Insights:** Preliminary observations on how effectively meta-innovations were moved from Trailblazer to Follower contexts, highlighting scalable success factors and potential bottlenecks.
- **Social Embracement Synthesis:** Analysis of user experience surveys to determine the overall societal impact and long-term viability of the implemented services.

To maintain project-wide coherence, all reporting milestones and data collection windows are strictly aligned with the overall project timeline and the evaluation schedule defined in WP3. This alignment ensures that the results from the F-LLs are ready for integration into the final cross-city comparative analysis, providing a unified conclusion on the resilience and transferability of the metaInnovations.

5. Evaluation of cross-fertilisation and transferability activities

This chapter evaluates the framework designed to facilitate the transition of innovation from Trailblazer to Follower. While the implementation of the cross-fertilisation and transferability activities is expected to be launched by M27, the foundational methodology has already been put in place (D1.2 – Cross-fertilisation and transferability framework and guidelines) to ensure that the upcoming exchanges of knowledge will be structured and impactful.

The framework and guidelines contain the up-to date methodologies and framework to deploy the activities and communication channels needed for the cross-fertilisation between the T-LLs and the F-LLs, and to the 10 observer cities, as well as the assessment of the transferability potentials. In addition to the framework, the process of facilitating transferability foresees the proposal of Key Performance Indicators (KPIs) that external and observer cities can use to assess whether the necessary preconditions for replication are already in place before starting to replicate the metaCCAZE solutions. These KPIs aim to support cities in evaluating their readiness level under a structured transferability scheme.

To streamline this process, the methodology organises the participating cities into specialised groups, taking into account the type of metaInnovation and whether the solution aims at transporting people or goods. In this context, the Living Labs (LLs) will be mapped under the main categories of automation & connectivity and electrification & connectivity, allowing for a clearer identification of comparable conditions and transferability requirements such as fleet level, infrastructure (digital & physical), levels (service & user).

In practice, if a city does not already meet the defined transferability KPIs under this scheme, replication should not start immediately. Instead, the city should first implement preparatory actions to ensure that the minimum KPIs are fulfilled before proceeding with replication activities.

Next steps

The finalisation of the group-based methodology marks the transition from structural planning to active knowledge exchange under the Cross-Fertilisation and Transferability (CF&T) framework (D1.2). Following the establishment of the transferability scheme and the definition of the readiness-oriented KPI approach, the consortium will initiate several rounds of cross-fertilisation meetings in the coming months. UNINA will circulate draft templates and background material to guide the discussion and facilitate structured data collection for Transferability KPIs. WP1 partners may be invited to provide methodological support and validation once the initial mapping and KPI proposal have been consolidated.

To ensure that the F-LLs can fully leverage the "lessons learned" from the Trailblazers before the height of their own demonstration phases, the consortium will initiate several rounds of cross-fertilisation meetings in the coming months.

For the timelines and scheduling, the dates are subject to final alignment with the LL Leaders and City Supporters and WP Leaders. The meetings will be done online and be group-based.

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6. Conclusion

The transition of the metaCCAZE F-LLs from conceptual planning to operational execution marks a pivotal milestone in the project's mission to scale shared, zero-emission mobility. Through the intensive metaDesign process (LL1-LL5), the six Follower cities: Athens, Kraków, Malta-Gozo, Milan, Miskolc, and Poissy, Yvelines (Paris Region), have successfully moved beyond passive replication to active contextualisation. By adapting Trailblazer innovations to their specific legal, administrative, and socio-economic frameworks, these cities have mitigated early technical risks and fostered the "social embracement" necessary for long-term viability.

Strategic preparations, including site surveys, vehicle type-approvals, and the establishment of Quadruple/Quintuple Helix engagement models, have ensured that each city is prepared for the upcoming Integration & Testing period (M27-M38). This phase will be underpinned by a robust Monitoring Plan aligned with the SIEF, ensuring that technical, environmental, and social impacts remain comparable across the entire consortium. Furthermore, the finalisation of cross-fertilisation thematic clusters provides a structured mechanism for continuous peer-to-peer learning, allowing Followers to bypass common implementation pitfalls by leveraging Trailblazer expertise.

Ultimately, this deliverable serves as the essential operational bridge, confirming that the F-LLs possess the technical integrity and stakeholder support required to initiate wide-scale demonstrations. These localised efforts collectively contribute to the broader European goal of achieving climate-neutral and smart urban mobility by 2030.

7. Literature /References

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8. Annex 1 – Gantt Charts

8.1. Communications Timeline F-LL

Use cases	Dissemination and Communication Planned Activities	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
Athens																																															
AT-UC01-A	Presentation at NTUA by OASA's Tactical Planning Department about Scheduling & Planning Operations and the Initial Integration of E-Buses into Athens' Public Transport Fleet																																														
	First Joint Meeting at the OSY Bus Depot (Agios Ioannis Rentis, Athens, Greece): Updates on E-Bus Operations & the Charging System during the early months of metaCCAZE and Athens' Bus Rollout																																														
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	NTUA Presentation: Technologies Developed to Date for the metaCCAZE Project in the Athens LL (BEST Event)																																														
	NTUA - Artificial Intelligence for Road Safety and Mobility Workshop: Presentation of the Athens UC Plan																																														
	NTUA - metaCCAZE & MOBILITIESFOREU: Discussion on Electrification, E-Buses, and the Athens UCs																																														
	OASA Electrification Workshop - Engaging Athens: metaCCAZE Use Case for Policy & Practice																																														
	"Night of the researcher" Event by NTUA (creation of posters about technical assets)																																														
	Prepare promotion material - leaflets & posters for UCs (All LL partners)																																														
	Preparation of news articles about metaCCAZE UCs (NTUA)																																														

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	Decide on news outlets to publish & follow editorial process (NTUA)																																														
	Engage professional associations (Hellenic Association of Transport Engineers, Technical Chamber of Greece) (All LL partners)																																														
	Plan Online Presence Strategy (All LL partners)																																														
	Plan Participation and Organisation of Conferences and Workshops (All LL partners)																																														
	Track progress and create online post for social media (Linked, Facebook, Twitter) (NTUA, OASA, Anaplassis)																																														
	Periodically post online (LinkedIn, Facebook, Twitter) about pilot progress (NTUA, OASA, Anaplassis)																																														
	Launch satisfaction survey (All LL partners)																																														
	Create dissemination material about results of pilot and survey (All LL partners)																																														
	Post and communicate in news outlets and communication media about immediate results of the pilot and respective surveys (All LL partners)																																														
	Quantify impact of pilot activities and creating core material that can be shared (NTUA, OASA)																																														
	Create post-pilot communication strategy and online presence strategy (NTUA, OASA)																																														
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Malta - Gozo																																															
GM-UC01	Set up the local marketing communication strategy defining key messages and communications protocols and channels (cover preferably all UCs)																																														
	Set up a webpage detailing use case on partners 'website (UM, MTIP)																																														
	Register activity planned for Science in the City (MTIP)																																														
	Carry out activity during Science in the City (All LL partners)																																														
	Set up teaser social media posts (pre-launch) on Facebook, LinkedIn (All LL partners)																																														
	TV slots during programs on local TV stations and advert (MTIP)																																														
	Installation branding and EU funding acknowledgement on vehicles and promotional material (MPT)																																														
	Carry out teaser activity during Public Service Expo (MTIP)																																														

Use cases	Dissemination and Communication Planned Activities	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
	Publish press release announcing launch of the service (MTIP, MPT)																																														
	Include announcement in existing organisation newsletter (UM, MPT)																																														
	Publish short video for social media (MTIP, MPT)																																														
	Print local flyer/poster and distribute demonstration along the route (MTIP, UM)																																														
	Launch demonstration: invite media (tv), stakeholders, citizens for hands on experience (MTIP)																																														
	Launch pop-up event at University of Malta KSU Freshers' Week (All LL partners)																																														
	Launch demo/event at Public Service Expo (All LL partners)																																														
	Participate in demonstrations to get citizen feedback (UM)																																														
	Update D&C Activity List with all carried out activities, including estimated reached audience (MTIP, UM)																																														
	Publish post-launch article on social media and website (UM, MPT)																																														
	Periodically post online (Linked In, Facebook) about pilot progress (UM, MPT)																																														
	Prepare a potential peer-reviewed publication about results of the LL (UM)																																														
Milan																																															
MI-UC01	Define the communication plan: objectives and strategy																																														
	Meet and involve local authorities																																														
	Identify partners and stakeholders																																														
	Define visual identity and key messages																																														
	Start to engage high school students																																														
	Activate local shops																																														
	Print local flyers																																														

Use cases	Dissemination and Communication Planned Activities	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
	Publish news in local newspapers and website																																														
	Set up teaser activities in the key points of the city																																														
	Press conference with Major, partners, students and citizens																																														
	Register the activity at European mobility Week 2026																																														
	Publish press release announcing the launch of the service																																														
	Include announcement in existing newsletter																																														
	Showcase the service at main meeting points																																														
	Launch meeting at one high school																																														
	Cross-media with the city events																																														
	Distribution of local flyers and postcards																																														
	Ensure visibility post launch																																														
	Follow-up survey for students																																														
	Dissemination event with local authorities, partners and students																																														
	Publish post-launch article on social media, newsletter, and website																																														
Miskolc																																															
MK-UC01-A	Create general communication strategy (MVK, BME)																																														
	Define key messages and communication channels (MVK, BME)																																														
	Plan campaign on Facebook (MVK, BME)																																														
	Publish news in local online media (MVK)																																														
	Prepare promotion materials (MVK)																																														
	Develop dissemination opportunities towards end users (MVK, BME)																																														
	Organise local campaign to enhance the visibility of the use case (MVK)																																														
	Publish press release announcing launch of the service (MVK)																																														
	Distribute promotion materials (MVK)																																														

Use cases	Dissemination and Communication Planned Activities	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
	Include announcements in online media (MVK)																																														
	Launch demonstration (MVK, BME)																																														
	Handle immediate feedback from users (MVK, BME)																																														
	Engage with local stakeholders (MVK)																																														
	Participate in community events to promote services (MVK)																																														
	Receive feedback from users about the service (MVK)																																														
	Update the project activity list (MVK, BME)																																														
MK-UC01-B	Create general communication strategy (MVK, BME)																																														
	Define key messages and communication channels (MVK, BME)																																														
	Plan campaign on Facebook (MVK, BME)																																														
	Publish news in local online media (MVK)																																														
	Prepare promotion materials (MVK)																																														
	Develop dissemination opportunities towards end users (MVK, BME)																																														
	Organise local campaign to enhance the visibility of the use case (MVK)																																														
	Publish press release announcing launch of the service (MVK)																																														
	Distribute promotion materials (MVK)																																														
	Include announcements in online media (MVK)																																														
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	Receive feedback from users about the service (MVK)																																														
	Update the project activity list (MVK, BME)																																														
Poissy, Yvelines (Paris Region)																																															

Use cases	Dissemination and Communication Planned Activities	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
PO-UC01-A	Define the overall communication plan (objectives, audiences, key strategy).																																														
	Meet and involve local authorities to ensure alignment and support. (Cities and local authorities)																																														
	Develop visual identity and core messages (Digital mobility hub and V2X)																																														
	Involve local bus and train users to support visibility and community presence in smart V2X supported mobility hubs																																														
	Publish initial news items on local websites and in local newspapers.																																														
	Organise teaser activities in key public areas of the city.																																														
	Publish an official press release announcing the service launch.																																														
	Include the announcement in existing institutional newsletters (website and LinkedIn)																																														
	Printed rollup in public areas of two mobility hubs to introduce and aware users of services																																														
	Conduct a follow-up survey with stakeholders to evaluate the effectiveness of solutions																																														
	Conduct a follow-up survey with stakeholders to evaluate the business model (V2X and Sensor Stack)																																														
	Dissemination event with local authorities, and partners																																														
PO-UC01-B	Define the overall communication plan (objectives, audiences, key strategy).																																														
	Meet and involve local authorities to ensure alignment and support (particular attention to taxi service providers)																																														
	Identify and engage partners and key stakeholders (Taxi, shared mobility service operators)																																														
	Develop visual identity and core messages.																																														

Use cases	Dissemination and Communication Planned Activities	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
	Involve local hotels (source of tourist) to support visibility and community presence in carpooling service																																														
	Publish initial news items on local websites and in local newspapers.																																														
	Organise teaser activities in key public areas of the city.																																														
	Publish an official press release announcing the service launch.																																														
	Include the announcement in existing institutional newsletters (website and LinkedIn)																																														
	Printed rollup in public areas of two mobility hubs to introduce and aware users of services																																														
	Conduct a follow-up survey with stakeholders to evaluate the effectiveness of solutions																																														
	Conduct a follow-up survey with stakeholders to evaluate the business model (shared mobility)																																														

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