REPLICATION ACTION PLANS FOR OSLO, GOTHENBURG, HAMBURG, MUNICH, BOLOGNA AND ROME

Project deliverable D7.2

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MOVE21 – Multimodal and interconnected hubs for freight and passenger transport contributing to a zero emission 21st century

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Project Executive Summary

The main objective of MOVE21 is to transform European cities and functional urban areas into climate neutral, connected multimodal urban nodes for smart and clean mobility and logistics. MOVE21 will do this through an integrated approach in which all urban systems are connected, and which addresses both goods and passenger transport together. As a result, MOVE21 will improve efficiency, capacity utilisation, accessibility and innovation capacity in urban nodes and functional urban areas.

The integrated approach in MOVE21 ensures that potential negative effects from applying zero emission solutions in one domain are not transferred to other domains but are instead mitigated. It also ensures that European transport systems will become more resilient. Central to the integrated approach of MOVE21 are three Living Labs in Oslo, Gothenburg, and Hamburg and three Replicator cities Munich, Bologna and Rome. In these, different types of mobility hubs and associated innovations are tested and means to overcome barriers for clean and smart mobility are deployed. The Living Labs are based on an open innovation model with quadruple helix partners. The co creation processes are supported by coherent policy measures and by increasing innovation capacity in city governments and local ecosystems. The proposed solutions deliver new, close to market ready solutions that have been proven to work in different regulatory and governance settings. The Living Labs are designed to outlast MOVE21 by applying a self-sustaining partnership model.

MOVE21 partners

The MOVE21 consortium consists of 24 partners from seven different European countries, representing local city authorities, regional authorities, technology and service providers, public transport companies, SMEs, research institutions, universities and network organisations.

- **Norway**: City of Oslo, Viken County, Ruter, Urban Sharing, Mixmove, Institute of Transport Economics, IKT-Norge
- **Sweden**: City of Gothenburg, Rise Research Institutes of Sweden, Business Region Gothenburg, Volvo Technology, Renova, Parkering Göteborg
- **Germany**: City of Hamburg, City of Munich, Hafencity University Hamburg, Deutsche Bahn Station & Service
- **Italy**: Metropolitan City of Bologna, Roma Servizi per la Mobilità, Roma Tre University
- **Belgium**: Eurocities, Polis
- **The Netherlands**: TNO
- **Greece**: Hellas Centre for Technology and Research

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Deliverable executive summary

D7.2 *The Replication action plan for Oslo, Gothenburg, Hamburg, Munich, Bologna and Rome* provides the framework for the replication activities and how they led to the development of Replication Action Plans in all six cities and regions.

It outlines the replication approach, how the cities selected their measure and assessed the transferability of the chosen innovations, and it explains the structure of the Action Plans. Moreover, the deliverable provides the Action Plans for each of the selected measures for replication. It thus provides a roadmap for the implementation of the replicated measures in each of the cities. Finally, the deliverable explains how the replication activities will be structured after the submission of the Action Plans and which support the cities will benefit from in order to achieve their goal: replicating one to three innovative measures from their peers.

Key words

Replication, Action Plan, innovation, community of practice, needs assessment, success factors, transferability, multimodal hubs, mobility-as-a-service, urban logistics.

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1 List of abbreviations and acronyms

Acronym	Meaning
API	Application Programming Interface
ASAP	As Soon As Possible
B2B	Business-to-business
B2C	Business-to-Consumer
BWI	Hamburg Ministry for Economics and Innovation
CB	Cargo Bike
CEP	Courier, Express and Parcel Services
CMBO	Metropolitan City of Bologna
DB	Deutsche Bahn
DEFAS	Online Travel Information System for Bavaria
EC	European Commission
GA	Grant Agreement
HCU	HafenCity University Hamburg
IAA Mobility	Internationale Automobil-Ausstellung (International Motor Show Germany)
KEW	Knowledge Exchange Webinar
KoM	Kick-off Meeting
KPI	Key Performance Indicator
LL	Living Lab
LTZ	Low Traffic Zone
LEZ	Low Emission Zone
MaaS	Mobility as a Service
MVG	Münchner Verkehrsgesellschaft (Mobility Operator of Munich)
MVV	Münchner Verkehrs- und Tarifverbund GmbH (Munich Transport and Tariff Association)
MS	Milestone
RC	Replicator City
P + R	Park and Ride
PT	Public Transport

RSM	Roma Servizi per la Mobilit (Mobility Agency of Rome)
SULP	Sustainable Urban Logistics Plan
SUMP	Sustainable Urban Mobility Plan
UR3	Roma Tre University
VHH	Verkehrsbetriebe Hamburg-Holstein GmbH (Mobility Operator of Hamburg)
WP	Work Package

2 Purpose of the deliverable

Work package 7 in MOVE21 is dedicated to replication and take-up. It brings together (by alphabetical order) the Living Lab cities – Gothenburg, Hamburg, Oslo – and three Replicator Cities – Bologna, Munich and Rome – with the aim of creating learning arenas for two-way knowledge exchange and replication, validating the measures and policies tested in the Living Lab cities through replication, and therefore increasing the impact of the project.

The main aim of the *Replication action plans for Oslo, Gothenburg, Hamburg, Munich, Bologna and Rome* is to describe the Action Plans for each of the selected measures for replication. It thus provides a roadmap for the implementation of the replicated measures in each of the cities. In addition, it specifies the framework for the replication activities and how they led to the development of Replication Action Plans in all six cities and regions. It outlines the replication approach, how the local authorities selected their measure(s) and assessed the transferability of the chosen innovations, and it explains the structure of the Action Plans. Moreover, the deliverable provides concrete indications about the future replication activities, how they will be structured after the submission of the Action Plans, and which support the cities will benefit from in order to achieve their goal: replicating one to three innovative measures from their peers.

2.1 Attainment of the objectives and explanation of deviations

The objectives related to this deliverable have been achieved in full and as initially scheduled. There is no major deviation that impacts the development of this deliverable. The introductory study visits to each Living Lab city were planned for the first year in order to facilitate the initial contact between cities and replication activities and were implemented four months into the second year of the project. The peer-learning visits which allowed to get an overview of the policies deployed in the Replicator Cities were held in Bologna and Rome in March 2023. The cities and regions were not able to participate in the peer-learning study visit in Munich before submitting their Replication Action Plans as the visit is planned for October 2023. Yet this was compensated by online exchanges during knowledge exchange webinars, and several cities also organised bilateral calls with Munich to get the information they needed to develop their Action Plans.

2.2 Intended audience

As the present deliverable outlines the Replication Action Plans, as well as offers guidelines for the cities' replication work within the timeframe of the MOVE21 project, the primary audience is constituted by the representatives in the Living Labs and Replicator Cities. At the same time, replication is facilitated by knowledge exchange and capacity building and partners across the consortium contribute to the replication activities; therefore, the deliverable is also addressed to them, with the purpose of coordinating and informing the technical work packages about technical support there might be needed along the replication path. The deliverable also informs the evaluation in WP8.

For the Cascade Cities, this deliverable will offer a quick overview of the lessons learned from the cities that started replicating innovative measures from their city peers. Finally, as a public deliverable, the Replication Action Plans of all six cities allow a wider audience of urban authorities, policy makers,

researchers, and other interested parties to get an understanding of the possible ways of replicating and even upscaling the measures tested in the Living Lab cities and related policies and practices beyond which can help Urban Nodes face their urban mobility challenges.

2.3 Structure of the deliverable and links with other work packages/deliverables

The replication activities outlined in this deliverable are fed by technical expertise, practical knowledge, and tools developed by partners across the consortium. In particular, the knowledge generation and knowledge collaboration work packages – that is, WP3 The Urban Social Layer, WP4 Governance Innovation, WP5 Technological Solutions and Integration, and WP6 Living Labs – are expected to contribute substantially to the various types of activities in the community of practice. The technical WPs (WP3, WP4 and WP5) shall provide the necessary input and help to ensure a smooth replication of the selected measures. A series of deliverables already submitted by the time of the development of D7.2 were key assets for all cities and regions, helping them to develop a good understanding of the measures implemented in the Living Labs.

D3.1 *Spatial context analysis for Oslo, Gothenburg and Hamburg* outlines the social frameworks and assessments, including socio-spatial considerations for the Living Lab test sites. The factors outlined in the deliverable are key to understand the context and thus the transferability potential of the measures developed in the Living Labs, and also inform Living Labs about factors to consider in their replication activities. The deliverable *Initial governance innovation and capacity context analysis for the Living Labs* (D4.1) helped to understand the enabling governance context for the take-up of innovation, thus also stimulating reflexion on the governance aspect of the replication processes. With D5.1 *Draft technology solutions* further information was made available to the six cities and regions about relevant technologies and their possible integration in the Living Labs. The *Integrated City Assessments* of all three Living Labs (D6.2, D6.3 and D6.4) as well as the *Living Labs establishment report* (D6.5) have been key sources of information to understand the measures the 6 local authorities could replicate form the Living Labs.

Replication in Living Lab cities will clearly be situated within the established Living Labs. At the same time, a significant amount of practical knowledge is generated in the Living Labs that feeds the knowledge exchange and capacity building activities. More, WP6 is not only about process management, but there is also a more general focus and structured work on innovation capacity and policy coherence that constitutes a significant input for knowledge exchange and replication activities. Therefore, a continuous dialogue with WP6 ensures coordination and synergy and that replication activities are embedded into the Innovation Co-Creation Partnerships (ICCPs) that drive the Living Labs.

The impact analysis framework for the activities in both the Living Lab Cities and the Replicator Cities is developed in WP8. Also, the replication activities are guided by the KPIs defined at project level and monitored by WP8. At the same time, application of data collection and methods and tools for impact assessment and evaluation are critical challenges that most cities need to face in the implementation of their local projects, and continuous capacity building is required. These are all reasons for a continuous dialogue and actions in synergy with WP8. Some of the key objectives of replication are to assess the transferability conditions of innovative measures and policies tested in the Living Labs, to validate them, and therefore to increase the impact of the project. This creates a direct link with exploitation tasks, managed in WP9, and outreach and dissemination activities, coordinated in WP10. The content of D7.2 builds on the capacity building methodology outlined in D7.1 *Capacity Building and Replication Master Plan*. D7.3, due in August 2024, will detail the city-specific action plans to prepare the transferability of selected measures to Cascade Cities.

3 Replication Action Plans – Methodology

3.1 Replication as a concept

Replication is the activity of duplicating, copying, reproducing, or repeating innovations or good practices that have been successfully tested in other places or cities and regions. It involves the use of lessons learned from pilots and demonstrations and applying them elsewhere. MOVE21 has an ambitious two-way replication process, in which both Replicator Cities and Living Lab cities replicate innovations from the other cities following an intensive knowledge exchange programme.

Different methodologies can facilitate replication and support urban mobility practitioners in transferring innovative measures and policies. MOVE21 focuses on methods that support the replication process based on peer-to-peer learning and in-depth capacity building. Replication is key in validating the innovative solutions and policies, and to do so the assessment of the transferability conditions is an essential step to ensure the take-up. The replication in MOVE21 is based on a two-way replication process. Replicated measures will be based on the one hand on the solutions co-created and demonstrated in the Living Labs, on the other hand demonstrated innovations in the Replicator Cities, shared within the MOVE21 community of practice (CP), will also be considered for replication. Based on the impact of the already adopted innovations in the three Living Labs and on their experiences, Replicator Cities choose and replicate the ones that answer their needs. Living Lab cities guide the Replicator Cities as sharers of experience and facilitate the replication of the innovations. All cities are being encouraged to replicate any interesting measures with the potential for high impact from either the Living Lab cities or the Replicator Cities. Both Living Lab and Replicator Cities exchange, learn, and replicate selected solutions, and the whole process is supported by peer-learning and capacity building activities. Figure 1 below represents the concept that underscores the replication activities in MOVE21.

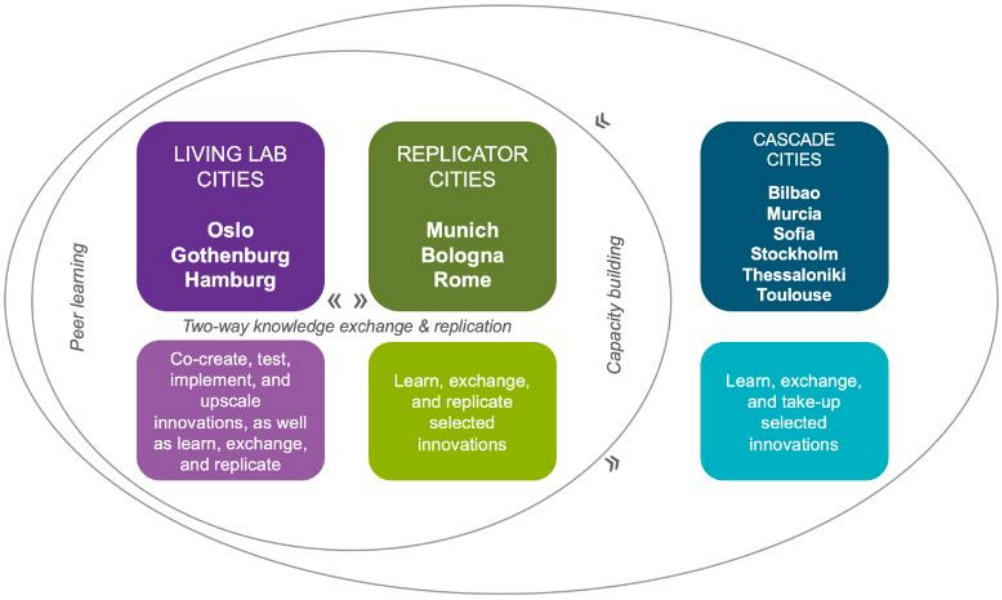

Figure 1: Replication concept

3.1.1 Targets of the replication process

This deliverable covers 12 measures. Each of the three Replicator Cities wrote a Replication Action Plan for three innovations, while the three Living Lab cities picked one innovative measure to replicate. The number of measures correspond to targets in the following KPIs defined in the MOVE21 Grant Agreement:

- 1.4. Number of MOVE21 innovations replicated in the 6 cities: +12 (2025)
- 3.2. Number of implemented MOVE21 innovations in the replicators: +9 (2025).

Beside these KPIs defining the replication process, the replicated innovations will contribute to meeting other KPIs set up at project level, among them:

- 1.2. CO2 reductions from local road transport in the three Replicator Cities: -8% (2025)
- 2.2. Increase of perceived security (crime, COVID-19 etc.) in the city-transport system, five point Likert scale.
- 2.3. Increase in active modes of transport thanks to incentive models / reward schemes: +10% (2025)
- 2.4. Reduction in transport related noise pollution
- 3.3. Number of new (micro-)hubs as a result of the project: +15 (2025)
- 3.4. Number of improvements in existing hubs as a result of the project: +33 (2025)
- 3.6. Load factors in urban freight as a result of MOVE21 Replication Activities, in numbers.
- 3.7. Reduced number of heavy (freight) vehicles in circulation as a result of the implementation: -4%
- 3.9. Increase in public transport use: +15% (2025)
- 3.12. Increased collaboration level between public-private entities and between transport domains in all collaboration cities / functional urban areas: 5 on a five point Likert scale (2025)
- 4.1. Perceived improved understanding of governance drivers and barriers to implementation of measures: 4.5 on five point Likert scale (2025)
- 4.3. Number of MOVE21 business models developed: +6 (2025)
- 4.4 Direct economic sectorial contribution to the welfare to the metropolitan area from city transport
- 5.2. Number of city representatives and experts that take part in capacity building, replication exchanges, study visits, workshops, webinars and Urban Nodes Forums: +250 (2025).

The list of KPIs is not exhaustive, but it gives a good approximation about what the city-specific Replication Action Plans focus on and the expected impacts of these activities.

3.1.2 Replication Action Plan Development Path

This chapter describes the different steps that guided all six cities and regions (Living Lab and Replicator Cities) in the development of their action plans. It details the activities performed and their outcomes as planned in D7.1 *Capacity Building and Replication Master Plan*. The process of developing the Replication Action Plans started with Knowledge Exchange Webinars and through the site visits which by the time of the submission of the Action Plans had been organised, in Oslo, Gothenburg, Hamburg, Bologna and Rome. Those exchanges allowed all partners and especially the Living Lab and Replicator Cities to be aware of the measures and innovations deployed in their peer cities and to have a precise overview of the measures tested in the Living Labs.

In cooperation with WP8, all Living Labs and Replicator Cities filled out Logbooks which serve in the evaluation process but also function as repositories for all cities and regions to have a precise overview of the innovations being developed and from which to select their replication measure(s).

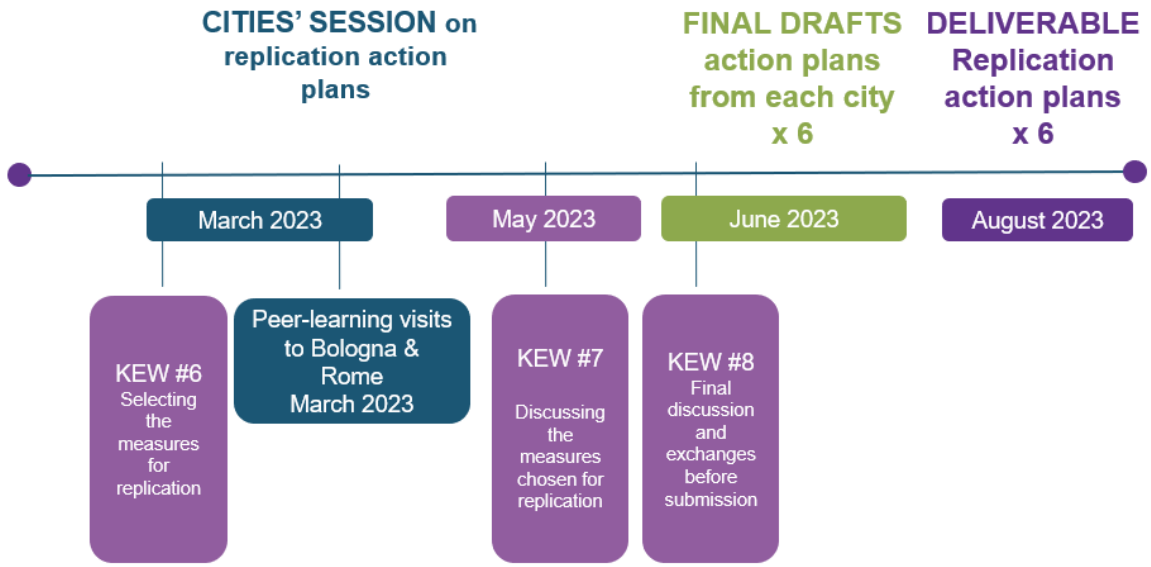

Figure 2: Replication timeline until Action Plan submission

A Cities' Session organised on 29 March 2023 in Bologna was structured in the form of a hands-on workshop where all cities and regions had the opportunity to co-create a first action plan outline with their peers and the technical partners. Each city/region selected one measure to focus on and could discuss the different replication steps necessary to adapt and implement the chosen measure in their own local context. The Knowledge Exchange Webinars (KEWs) 6, 7 and 8 (see figure 2) helped the cities to gradually specify first initial ideas of measures to replicate (KEW6). The KEW7 was focused on the measures implemented in Gothenburg, especially the *Park and Bike Node* in Klippan and the *Cargo-waste co-freight* concept in Lindholmen, as Munich, Bologna and Rome had shortlisted those measures for their replication plan. Finally, during KEW8 all cities presented their final list of replication measures and had a chance to ask any remaining questions to the other city peers. By early July, all cities provided their Action Plans, to which they received and integrated comments.

3.1.3 Replication Action Plan Structure

The Replication Action Plans presented in the next chapters all follow the same methodology. To meet the requirements of transferability and feasibility, all cities went through a three-step process which allowed them to select a measure(s) with a high potential for replication, which fits their needs.

1. ***Measure selection***

First, each city selects a measure or a set of measures corresponding to its interests from the ones listed in the Logbooks, by the Living Lab and Replicator Cities. In a second step the city describes them briefly, detailing the specific aspects they will replicate.

2. *Measure analysis*

To assess whether the measure is fit for replication each city runs a transferability assessment and identifies the main challenges they could face when implementing the measure. Doing so, the replication feasibility gets maximized as the selected measures have to meet a high replication score (above three).

- ***Transferability potential***

Each city carries out a short transferability assessment of each measure listed based on the information provided by the related city and the information gathered during the knowledge sharing and replication activities. Each Living Lab and Replicator City reflects on the conditions that made the measure successful in the city, and where the measure was first implemented, considering for example resources, legal framework, etc. It assesses whether those conditions can be replicated in their specific context with scores ranging from one to five, one standing for low transferability potential and five being high transferability potential.

- ***Analysis of expected challenges***

For the conditions for which the transferability potential is lower or equal to three, cities specify which aspects might be the most challenging and why, and how to address the challenge(s).

3. *Planning the implementation steps*

Based on the measures' analysis carried out in the two preceding steps, the cities complete an action plan for the selected measure(s) indicating the implementation steps, the actors involved, the timelines and the milestones for monitoring and evaluation.

3.1.4 Replication Activities after submission of the Action Plans

All six cities submitted their Action Plans by the end of July 2023. For the continuous dialogue to be kept and the required knowledge to be exchanged, the upcoming Knowledge Exchange Webinars as well as the Cities' Session will be used to monitor the advancement of the replication and to make sure the Replicator Cities receive feedback on the deployment from the cities which already are at a later stage of implementation. The calendar below outlines a provisional spread of the activities and topics to be covered from September 2023 until October 2024. In October 2024 all six cities and regions will present first results from their replication efforts.

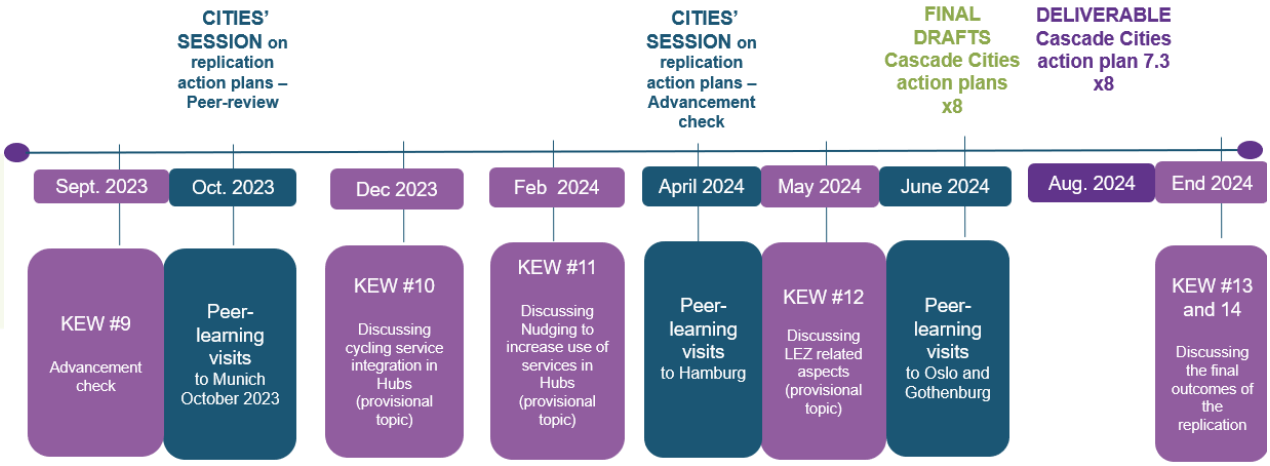

Figure 3: Replication timeline After D7.2 submission

4 Replication Action Plan – Gothenburg

4.1 Selected measure

The Gothenburg Living Lab selected to replicate from Bologna the development of ***Technical Guidelines for designing metropolitan Mobility Hubs*** as replication measure. Bologna's measure shows three main innovative aspects. First, it concerns the development of a design tool that can be applied by each local entity and community to coherently implement the mobility hubs planned under the SUMP. Second, the Guidelines allowed to develop a protocol of understanding with the national railway operators as well as the creation of a working group with all public entities from the different levels together with the local mobility agency for public transport. In addition, this development also implied public and private collaboration in funding the implementation of measures foreseen by the design tool. Finally, a design competition was organised to concretely apply the Guidelines and draw conclusions on the design process.

For the replication, the City of Gothenburg mainly focuses on the joint development of the Guidelines with the aim of clarifying the technical conditions to consider when deploying mobility hubs and allow to update the existing Technical Handbook. The replication of the Guidelines also allows to align existing governing processes while also expanding the coordination to the Living Lab partners. The replication does not foresee to replicate the associated hub design competition as implemented in Bologna, as that falls beyond the resources and timeline available in MOVE21.

4.2 Measure – Analysis

The below analysis focuses mainly on the conditions enabling the implementation of Guidelines for Mobility Hubs in Gothenburg, and their elaboration by the local authority in collaboration with other relevant stakeholders. The detailed scoring criteria is available under Annex B.

4.2.1 Transferability potential

Table 1 – Gothenburg's transferability assessment

Conditions for implementation	Score	Justification for answer
Staff availability	4	There are staff with relevant competencies and experiences in Gothenburg Living Lab. Necessary to allocate time from relevant individuals not working within the project until now.
The time needed for implementation	3	The benefit from Guidelines makes this an important priority. If there would be a demand to replicate the full process of Bologna it will most likely not be possible within the timeframe of the project. The measure's prioritized aspects, as determined by the Living Lab, have a higher likelihood of being fully replicated within the designated project timeframe. Yet, the time needed for the translation of Bologna's Guidelines might have an impact on the replication timeline. The time required for the implementation of the Guidelines in upscaling and constructing a new hub will exceed the project's duration.

Governance related efforts	5	There are comprehensive experiences in the municipality in developing and implementing Technical Guidelines. To align these Guidelines with existing governing processes does not meet any foreseen challenges.
Technical conditions required	4	To explore the technical conditions for designing mobility hubs will require new knowledge. This is in line with other experiences and technical conditions when it comes to for example public transport, parking and infrastructure to build upon. Additional contacts to relevant stakeholders and experiences from other cities than Bologna is needed.
Financial framework	4	Funds are available within the project, mainly needed for staff time. One possible challenge is that several project partners are relying on consultants, and further clarification is needed whether consultants can be used within the project and covered by the project.
Legislative/ regulatory framework	4	Since the legislative/regulatory framework in Bologna is not directly transferable to Gothenburg's local context this needs an analysis. The municipality and local partners have good knowledge and experience, and it is expected to be able to adapt the Guidelines for Gothenburg.
Communication	5	There are well established processes and communication channels for technical Guidelines, both in relation with subcontractors and in relation with citizens, and within the municipality and the local partners.

4.2.2 Main challenges expected

Based on the above transferability assessment only, the time needed for the implementation is scored at three out of five. It thus represents the highest challenge for the Living Lab in Gothenburg for the replication of the chosen measure, which is why the Gothenburg Living Lab decided to indicate extra monitoring steps. The Gothenburg Living Lab will thus monitor the following points:

- Is there a good understanding of Bologna's Guidelines from the Gothenburg working group? Is there a need for more discussions and documentation with Bologna and/or work package leaders? The translation of Bologna's *Technical Guidelines for designing metropolitan Mobility Hubs* by autumn 2023 will be essential to ensure this step.
- The implementation of the Guidelines requires analysis ahead of possible funding opportunities at municipal (such as the city's plan and development process), regional (such as green bonds and regional public transportation plan), national and on European level. An evaluation on how realistic the opportunities to fund infrastructure and investments to implement mobility hubs are needs to take place, and whether they can be done in accordance with the Guidelines in the city and beyond. This task shall be undertaken in the course of 2024.

4.3 Measure – Technical Guidelines for metropolitan Mobility Hubs - Action Plan

Based on the measures' analysis carried out above, the following action plan details the replication steps to be taken by the Gothenburg Living Lab in order to adapt and implement Technical Guidelines for Mobility Hubs. It also provides key attention points to check during the implementation.

Table 2 – Gothenburg's Action Plan

Action	Timeline	Responsible department / organisation	Key attention points
Secure decision to update the current technical handbook.	September 2023	City of Gothenburg	Decision by administrative management
Gap analysis to identify discrepancies and gaps between the current technical handbook and the desired scope. Mapping relevant elements of Bologna's Guidelines.	September-November 2023	City of Gothenburg Others involved: All Gothenburg partners (Business Region Gothenburg, RISE, Volvo, Renova, Pakeringsbolaget)	Analysis presented for task force by November 2023.
Adopt working plan to replicate technical guideline, including working group.	December 2023	City of Gothenburg Others involved: All Gothenburg partners (Business Region Gothenburg, RISE, Volvo, Renova, Parkeringsbolaget)	Create working plan. Decision by administrative management. Plan presented for Gothenburg Task Force.
Gather knowledge and experiences, replicate relevant parts of Bologna's Guidelines.	Iterative process with drafts and sections developed during 2024	City of Gothenburg Possible collaboration with other cities (Oslo and Rome) within MOVE21. All Gothenburg partners (Business Region Gothenburg, RISE, Volvo, Renova, Parkeringsbolaget) Regional public transport operator, local mobility experts, property owners	
Formal approval of technical handbook including replicated aspects regarding mobility hubs.	October 2024	City of Gothenburg	
Publication of the Guidelines.	December 2024	City of Gothenburg	In accordance with work plan. Suggested milestone: published guidelines.
Analysis of possible funding opportunities for development of mobility hubs.	April 2025	City of Gothenburg	In accordance with work plan.

5 Replication Action Plan – Hamburg

5.1 Selected measure

The Hamburg Living Lab has shortlisted one measure for replication which is the ***Mobility on demand for people and freight*** concept developed by the Oslo Living Lab. The main service innovations developed by the Oslo Living Lab in this concept are the home transportation from stores in shopping centres using an on-demand solution for senior citizens, i.e. cargo-hitching using on-demand public transport. Besides, there is a service innovation as older people can buy from local shops without using their private car to carry home the groceries.

In its replication, Hamburg is planning to pilot a combined transport of people and goods on a bus line of the public transport provider of Hamburg. The general idea is that existing resources and capacities will be used more efficiently if people and goods travel in one shared vehicle, thereby also reducing traffic emissions. It is assumed, that this combined transport will connect local economic stakeholders and could result in new business models which can create added value for the local inhabitants.

The Bus Line 388, also called “Dorfkutsche”, which could be translated to “village carriage”, has been chosen for the pilot because it circles in a comparatively manageable area and is connecting the relevant places of the quarter Rissen. Furthermore, previous offers involving the carrying of goods have already been made with this bus line. The pilot will focus on transporting shopping for older people. Specifically, it is planned to bring purchases from the centre of Rissen and the shops surrounding the street Wedeler Landstraße to retirement homes along the bus line.

Reasons for choosing this measure for replication are the priority given to this measure by the Living Lab, the high interest from local stakeholders in the measure, and the innovative aspects it covers, mainly the integration of public transport and logistics deliveries. The pilot implementation is planned to take place in two phases. The first phase will, different from Oslo, be a more analogue approach and only use a minimum of additional technologies. This is to test the general acceptance and willingness of the local shops and customers to participate and make use of the new service, as well as for testing the process as such on the side of the bus company and shops. For the second phase, if the first one will be considered as successful among all parties involved, additional technologies and further equipment or external service providers can be considered. This ranges from locker systems to web or mobile ordering applications to assistance by a professional logistics company. These aspects, however, mean expenses for third parties which are considered as too risky without having experiences from a first phase. A third phase should then be as self-sustaining as possible with none or only little need for operational management or coordination by the local MOVE21 partners or for additional funding.

5.2 Measure – Analysis

5.2.1 Transferability potential

The below table details the action plan for the replication of the measure selected by Hamburg.
The detailed scoring criteria is available in Annex B.

Table 3 – Hamburg's transferability assessment

Conditions for implementation	Score	Justification for answer
Staff availability	4	The Task Force of the Hamburg Living Lab is available to work on this concept. Additionally, MOVE21 funding (subcontracting) is available for specific contributions.
The time needed for implementation	3	The concept of combined transport has been prioritised by the Task Force and strong efforts are being made to bring this into a pilot implementation. A phased pilot approach has been chosen that allows an iterative approach in developing the pilot. In line with the feedback from local stakeholders, it has been decided not to develop additional technologies / software or make changes in the bus construction. This test phase will use analogue methods / existing technologies to first identify the key aspects of the use case, information needs and exchanges, etc. This approach also allows the concept to move forward more quickly. Due to the time gain it is expected that the prioritized results can be achieved.
Governance related efforts	5	It is a new topic for the municipality. Nevertheless, knowledge on that topic and additional contacts to relevant stakeholders exist to implement the intended solution.
Technical conditions required	3	As the knowledge of and resources for additional technologies are limited and local stakeholders and end-users prefer a more analogue approach, it is planned for the first phase to only use a minimum of possibly useful additional technologies. At the same time however, knowledge is gained in close contact with project partners and external stakeholders.
Financial framework	5	Funds are available within the project for the first two development stages of the pilot. External partners will bring own resources in the pilot implementation.
Legislative/ regulatory framework	2	There are some regulations on what can be transported within a public bus. It is not yet clear if these regulations are adequate for this concept. Also, liability concerns/responsibilities remain to be clarified at this point.
Communication	5	The municipality, also in cooperation with local stakeholders or other partners, have platforms and channels available to reach out to the general public, as well as to individual stakeholders.
Operational framework	2	There may be some obstacles regarding the inclusion of the new service in the current operation processes of the public bus line. Operationally, the transport and especially exchange of goods between supplier-transport provider-recipient will require the development of new practices or possibly infrastructure (inside the bus or at stations). The phased pilot approach intends to test and elaborate these aspects. These may be more relevant when moving from pilot implementation to regular operation.

5.2.2 Main challenges expected

There are four conditions for which the transferability potential is ranked below three. The first regards the legislative and regulatory framework. As the regulatory and legislative context in Hamburg is

different from the one in Oslo, their innovations are not necessarily directly transferable in Hamburg's local context. Therefore, it is necessary for the Hamburg Living Lab to build their own understanding of the local legislative/regulatory frameworks that come into play for this intervention. Hamburg is facing the challenge by ensuring on-going outreach and discussions with the public transport provider, relevant authorities, shops, and customers to determine which regulatory, insurance and liability concerns are relevant to this concept in the local context and what, if any, legislative action might be necessary. Hamburg will thoroughly check on following questions:

- Which stakeholders are responsible for regulatory compliance and enforcement? How are these roles impacted in the pilot phases?
- Which liability concerns arise for which stakeholders? How are these addressed?
- At which levels do regulatory or liability conflicts arise: between stakeholders in the pilot operation? Between stakeholders and compliance/enforcement bodies? How are conflicts resolved?
- Which regulatory or liability framework solutions are developed in the piloting phases and are these scalable to broader implementation?

The operational framework is the second main challenge expected by the Hamburg Living Lab in the replication of the measure. The operational context in Hamburg differs from Oslo in that the combination of goods with a fixed schedule public bus reduces the flexibility of the 'on-demand' goods service. New operational concerns arise, e.g. how to incorporate goods pick-up/drop-off into the existing bus route (stations, service times) or how to structure orders into specific delivery windows. Adding additional complexity is the focus of the pilot on the older people user group, who may have unique demands on operation. It will be key to ensure the involvement of the transport provider, supplier businesses and representatives of the recipients in the operational planning for the pilot concepts. Co-develop and monitoring of operational goals and benchmarks with these stakeholders will be a special attention in the replication process.

The following questions will be kept under scrutiny:

- To what extent are changes to the 'standard' scheduled bus operation and/or operating procedure in the involved stores required in order to integrate transport of goods?
- Do certain target consumer groups have specific operational demands or requirements? What are the repercussions of these on overall concept feasibility?
- Are there realistic technological or otherwise standardisable solutions to these operational challenges that would enable up-scaling to further bus routes or neighbourhoods?

A third challenge is the time needed which might be tight but as the test phase will use analogue methods / existing technologies to first identify the key aspects of the use case, information needs and exchanges, etc. this allows to move forward more quickly. Due to the time gain it is expected that the prioritized results can be achieved.
Finally, for the technical conditions which might be a challenge, it is essential that a good cooperation and dialog is kept with all Hamburg Living Lab partners and particularly the Oslo Living Lab.

5.3 Measure – Mobility on demand for people and freight - Action Plan

Based on the measures' analysis carried out above, the following action plan details the replication steps to be taken by the Hamburg Living Lab. It also provides key points of attention during the implementation.

Table 4 – Hamburg's Action Plan

Action	Timeline	Responsible department/organisation	Key attention points
Advertising concept for Phase 1	June-September 2023	City district of Altona, Senate Chancellery Others involved: VHH, Stadtteilschule Rissen, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, retirement homes, local newspapers	Number of people/shops reached; Number of shops willing to participate; number of citizens/ retirement homes willing to participate
Implementation of concept for Phase 1	October-December 2023	City district of Altona, Senate Chancellery Others involved: VHH, Gemeinschaft Rissener Kaufleute, retirement homes	Number orders/deliveries; Number of customers; Number of goods transported/delivered; Overview of goods ordered/delivered; Information on target group/customers; If possible emissions saved
Evaluation of Phase 1, planning of Phase 2	January-February 2024	Altona, Senate Chancellery, BWI, DB, HCU Others involved: VHH, Stadtteilschule Rissen, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, retirement homes	Evaluation of the overall concept and of monitoring data collected during phase 1
Discussing and including additional offering/features in the service	February-March 2024	Altona, Senate Chancellery, BWI, DB, HCU Others involved: VHH, Gemeinschaft Rissener Kaufleute, Stadtteilschule Rissen, Rissener Bürgerverein, retirement homes	Additional features; "Level of innovation/evolution" compared to phase 1
Finalisation of concept for Phase 2	April 2024	Altona, Senate Chancellery, BWI, DB, HCU Others involved: VHH, Stadtteilschule Rissen, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, retirement homes	

Advertising concept for Phase 2	April-May 2024	Altona, Senate Chancellery Others involved: VHH, Stadtteilschule Rissen, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, retirement homes	Number of people/shops reached; Number of shops willing to participate; number of citizens/ retirement homes willing to participate
Implementation of concept for Phase 2	May-September 2024	Altona, Senate Chancellery Others involved: VHH, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, retirement homes	Number orders/deliveries; Number of customers; Number of goods transported/delivered; Overview of goods ordered/delivered; Information on target group/customers; If possible emissions saved
Evaluation of Phase 2	October-November 2024	Altona, Senate Chancellery, BWI, DB HCU Others involved: VHH, Stadtteilschule Rissen, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, retirement homes	Evaluation of the overall concept and of monitoring data collected during phase 2
Conceptualisation of Phase 3	December 2024-February 2025	Altona, Senate, BWI, DB, HCU Others involved: VHH, Stadtteilschule Rissen, Rissener Bürgerverein, Gemeinschaft Rissener Kaufleute, further logistic companies (tbc).	

6 Replication Action Plan – Oslo

6.1 Selected measure

The Oslo Living Lab aims to replicate the Bologna ***Technical Guidelines for designing metropolitan Mobility Hubs***. As mentioned earlier, Bologna's measure showcases three key innovative elements. First, it involves the creation of a design tool, tailored for each local entity and community, to ensure the consistent implementation of mobility hubs outlined in the Sustainable Urban Mobility Plan (SUMP). This approach has led to the formulation of Guidelines, facilitating the establishment of a mutual understanding with national railway operators. Moreover, it has initiated the formation of a collaborative working group comprising various public entities across different levels, in conjunction with the local mobility agency for public transport. This endeavour has fostered a cooperative effort, involving both public and private sectors, to secure funding for the execution of measures specified by the design tool. Lastly, a design competition was orchestrated as a tangible application of the Guidelines, resulting in practical insights into the design process.

The Oslo Living Lab wants to utilize the Bologna Guidelines as a foundation to develop its own set of Guidelines customized to Oslo. The Bologna Guidelines have a comprehensive scope with a regional perspective. The Oslo Living Lab seeks to tailor this framework to the local context within the scope of the municipal boundaries of the City of Oslo. This effort has the potential to address existing knowledge gaps and assist Oslo in adopting a more strategic and comprehensive approach to mobility hubs.

6.2 Measure - Analysis

6.2.1 Transferability potential

The table below summarises the transferability potential of the selected measure for replication by the Oslo Living Lab. The detailed scoring criteria are available in Annex B.

Table 5 – Oslo's transferability assessment

Conditions for implementation	Score	Justification for answer
Staff availability	4	The Oslo Living Lab has available staff with relevant knowledge and capacity.
The time needed for implementation	3	Depends on translation of Bologna's Guidelines and communication with Bologna.
Governance related efforts	4	The Oslo Living Lab experience and capacity and has included the relevant stakeholders already.
Technical conditions required	N/A	Not relevant for the replication.
Financial framework	5	The needed resources are within MOVE21.
Legislative framework	N/A	Legislative barriers and any judicial differences between Norway and Italy need to be evaluated.
Communication	4	Communication resources are available within Oslo Living Lab.

6.2.2 Main challenge expected

Only the time needed for implementation is equal to three in the above transferability assessment, and thus constitutes the only challenge identified by the Oslo Living Lab. The main worry for the replication lies in the timely availability of the translated Guidelines. To overcome the barrier, the Guidelines shall be proofread on time and the communication with Bologna shall be ensured to validate the understanding of their Guidelines.

6.3 Measure – Technical Guidelines for metropolitan Mobility Hubs - Action Plan

The Oslo Living Lab aims to replicate the *Technical Guidelines for metropolitan Mobility Hubs*, by first understanding the main aspects which would fit their local planning context and adapt the guiding principles which can help in the future development of mobility hubs. Based on the measures' analysis carried out above, the Oslo Living Lab has defined following implementation steps for the replication of the selected measure.

Table 6 – Oslo's Action Plan

Action	Timeline	Responsible department/organisation	Key attention points
Mapping replicating relevant elements of Bologna's Guidelines. **Which sections of the framework hold direct transferable value?** **What types of strategies and processes can Oslo use?** **Which actions can Oslo replicate?**	June – December 2023	City of Oslo, Agency for urban environment Others involved: All Oslo Living Lab partners	Results will be presented for Oslo LL in November-December 2023
Create indicators in order to measure progress.	June – December 2023	City of Oslo, Agency for urban environment Others involved: Partners from WP3, WP6, WP4	Available list of indicators
Anchor guideline creation process with relevant stakeholders and shareholders in Oslo.	June – December 2023	City of Oslo, Agency for urban environment Others involved: Partners from WP3, WP6, WP4, all Oslo Living Lab partners	Meetings with key stakeholders and shareholders are organised
Create progress plan with milestones and deadlines for each action.	June – December 2023	City of Oslo, Agency for urban environment Others involved: Partners from WP3, WP6, WP4, Oslo Living Lab partners	Progress plan available and with milestones

Based on actions above, create Oslo Guidelines for Mobility Hubs	January – December 2024	City of Oslo, Agency for urban environment Others involved: WP3, WP6, WP4, Ruter, City Government, All Oslo Living Lab partners	

7 Replication Action Plan – Bologna

7.1 Selected measures

The Metropolitan City of Bologna has identified three measures for replication, the first being the ***Park and Bike Node*** in Klippan developed by the Gothenburg Living Lab. In Gothenburg, this measure entails:

- Integrating third-party parking apps and public bike sharing apps, potentially involving other shared micro-mobility operators.
- Enhancing bicycle and shared micro mobility conditions in the test site area, including guidance, wayfinding, viability measures, establishing hub space with e-scooter parking, and installing information signs.
- Implementing signalling and markings to create a recognizable multimodal hub identity (combining car park and bike facilities) and improving connections to public transport stops like trams and ferries.
- Emphasizing the local benefits to neighbouring communities and engaging them in the process.

The replication of this measure in Bologna will address a distinct requirement compared to Gothenburg's version. In Gothenburg, the end user parks the car and uses a bicycle, while in Bologna, the end user parks the bicycle and takes a train or bus (and vice versa). This setup leverages an expanded multimodal offering, fostering a mode shift away from polluting vehicles for commuting. Outside the scope of MOVE21, the promotion of this form of multimodality and the reduction of polluting vehicle use will involve the construction of new cycling stations near the San Giorgio di Piano and San Pietro in Casale railway stations.

Funded outside the scope of MOVE21, each new station will provide three cargo bikes and 40 bike slots, distributed across automated guided bike racks on two levels. These stations will be housed within automated iron and glass structures equipped with sliding doors, lighting, video surveillance systems, bike maintenance columns, and two electric charging points.

Within the framework of MOVE21, Bologna will draw inspiration from the Gothenburg model to enhance user experience and improve these new cycling stations across the metropolitan area. Innovations focused on cyclists' needs will be introduced and tested. In particular, the development of an app for managing and reserving parking spaces and services at the bicycle hub will play a crucial role. Moreover, enhanced wayfinding, signage, and markings aimed at bolstering multimodal travel and establishing a sense of place identity will be formulated and implemented in Bologna.

The integration between different applications, which is an aspect covered in the measure developed in Gothenburg, will not be part of Bologna's replication effort. The app being developed in the MOVE21 context to manage the new bicycle hub (for private bicycles and cargo bikes, not for sharing) will not be immediately integrate with other transportation systems available at the hub.

However, there is an intention to eventually integrate this app with another one currently being developed by the Municipality of Bologna (outside the scope of MOVE21). This second app (under development by the Municipality of Bologna and not by the Metropolitan City of Bologna) will manage four bicycle hubs under the Municipality's development. It is not clear when the Municipality of Bologna

will launch this app. If time allows the integration between the two apps will be attempted with MOVE21. If this integration proves successful and useful technical information becomes available, it will be incorporated into MOVE21 results from Bologna.

The second measure involves the ***Cargo-waste co-freight*** innovative consolidation model tested by the Gothenburg Living Lab at the Lindholmen test site. In Gothenburg, this measure encompasses:

- Expanding the current *Cargo-waste co-freight* system to include the utilization of parcel boxes for outgoing deliveries.
- The aim is to redirect more transportation to the *Lindholmsleveransen* terminal and subsequently integrate parcel deliveries into the pre-existing consolidated waste-freight circuit.
- Further developing the concept and promoting its adoption to minimize the necessity for individual transports among the stakeholders within the area.

Through the replication, Bologna will adapt this concept to cater to material flows within the realm of bicycle repair. Notably, stakeholders in the cycling industry in Bologna have highlighted a critical issue tied to the disposal of waste materials originating from bicycle repairs and the replacement of parts. Currently, the management of such waste materials, particularly rubber and metal, is handled independently by each individual cycling workshop. This decentralised approach results in inefficiencies and environmental pollution. Bologna aims to address this concern by exploring the feasibility of a more streamlined and structured approach, potentially introducing a more efficient business model for managing waste materials disposal. Simultaneously, Bologna plans to experiment with shared procurement of raw materials necessary for the functioning of cycle workshops. These raw materials would then be distributed to the workshops using environmentally friendly means of transportation.

As part of MOVE21, Bologna will implement a collaborative measure with a non-profit association, encompassing several key aspects:

- Establishing a network of interested cycle workshops
- Consolidating required raw materials at the hub of the non-profit association
- Distributing these raw materials across the urban area via the non-profit association, utilizing cargo bikes for a single inbound trip
- Using the same cargo bike to collect waste materials from the cycle workshops and return them to the non-profit association's hub
- Properly recycling of waste materials by cargo bike from the hub to the landfill when quantities warrant it

Through this initiative, the effectiveness of the business model for funding the service will be assessed. Moreover, the environmental benefits achievable through broader implementation (involving more workshops) will be measured, focusing on the reduction in the number of transports within the urban area. This includes considering the shift from polluting vans, currently used, to non-polluting vehicles for round and return trips.

The third measure involves the ***Mobility Hub*** tested by the city of Hamburg at Kaltenkircher Platz. In Hamburg, this measure includes:

- Establishing public parking spaces to facilitate the implementation of more environmentally friendly logistics and mobility solutions.
- Creating test sites for pioneering and sustainable last-mile logistic processes, such as Micro-Hub and cargo-bike deliveries.
- Additionally, it involves introducing enhanced mobility services, encompassing car sharing, bicycle parking, micro-mobility options, and public transportation, all contributing to a sustainable and multi-modal transportation network.

Bologna plays host to a multitude of large-scale temporary events scattered across different parts of both the urban and metropolitan areas. These events encompass a wide spectrum, ranging from shows at the Fair district and the city stadium to gatherings in parks and bicycle hubs. Such occasions attract significant public participation and prompt the involvement of numerous logistical entities to provide event-related services.

Taking inspiration from the hub in Hamburg, Bologna is set to explore an initiative designed to promote the utilization of bicycles and cargo bikes by both the general public and logistical participants who converge on these major events within the city. The strategy involves the establishment of designated temporary (cargo)bike parking areas and facilities situated in publicly accessible locations nearby. The central objective of this measure is to test requisite conditions that are vital for implementing such a service, both from a legislative/regulatory standpoint and a business perspective. This approach will also involve evaluating the measure's effectiveness in terms of encouraging the adoption of non-polluting vehicles during significant large-scale events. This could potentially lead to a reduction in the allocation of space for parking cars and mopeds in nearby public areas, thereby contributing to a more sustainable event landscape.

7.2 Measure 1 - Park and Bike Node - Analysis

The sections below show the transferability and challenge assessment made for the first selected measure for replication of the *Park and Bike Node* concept.

7.2.1 Transferability potential

The table details the transferability assessment of the first replication measure from the perspective of the Metropolitan city of Bologna.

Table 7 – Bologna's measure 1 transferability assessment

Conditions for implementation	Score	Justification for answer
Staff availability	5	The staff available within the Metropolitan city of Bologna is sufficient to accomplish the activities needed to replicate the selected innovations.
The time needed for implementation	5	The time expected to be used to replicate the selected innovations is within the timeframes set forth in the project.
Governance related efforts	5	The Metropolitan city of Bologna has experience and capacity to coordinate activities and public-private entities/partners involved in replication of selected innovations.

Technical conditions required	2	The Metropolitan city of Bologna does not have the technical knowledge to replicate the selected innovations. For this reason, an external support is needed to cover this gap.
Financial framework	4	The construction of the new cycle stations is covered with funds external to MOVE21. MOVE21 funds must be used to operate/manage the innovative services activated to support the new cycle stations, their promotion and wayfinding.
Legislative/ regulatory framework	4	The new cycle stations are implemented in accordance with the *Technical Guidelines for designing metropolitan Mobility Hubs*, already implemented by the metropolitan city of Bologna. The e-platform to operate/manage the new cycle stations is being developed having as a technical reference the platform used by the Municipality of Bologna to manage its cycle stations network. An effort will be made to integrate/extend the platform of the new (metropolitan) cycle stations into the platform of the Municipality of Bologna.
Communication	4	The Metropolitan city of Bologna already has experience and capacity to communicate with stakeholders, citizens and potential users of the new bike stations. The communication and marketing campaign is included in the communication campaign of the *Bicipolitana*, already underway to promote and support the cycling network and its services at the metropolitan region level
(Include any other factor specific to the project)	4	Relations with the various public-private partners of the working group can be difficult, in particular with the railway service operator which owns the areas where the new cycle stations will be built. However, the Metropolitan city of Bologna is working to smooth out possible critical issues.

7.2.2 Main challenges expected

The foremost challenging aspect, identified through the transferability assessment, is the score below three in terms of technical conditions required. This factor stands as a significant obstacle anticipated by the Metropolitan City of Bologna in the replication process. To bridge this technical gap, external assistance is being sought to aid in the development of the e-platform and its subsequent integration or expansion within the Municipality of Bologna's platform. Furthermore, this support will extend to the operation and management of the new cycle stations. By November 2023, the Metropolitan City of Bologna will initiate a call to source suitable external technical support. This move is aimed at securing the necessary expertise. By January 2024, it's anticipated that the Metropolitan City will formalise a contract with the chosen external technical support entity.

7.3 Measure 1 - Park and Bike Node - Action Plan

The Metropolitan City of Bologna aims to replicate the innovative aspects tied to social and service innovation for this particular measure. The focus is on enhancing services for cycling at train stations. While the application integration will not be a part of Bologna's replication effort, the app being developed in the MOVE21 context to manage the new bicycle hub (for private bicycles and cargo bikes, not for sharing) will not immediately integrate with other transportation systems available at the hub.

However, there is an intention to eventually integrate this app with another one currently being developed by the Municipality of Bologna. This second app will manage four bicycle hubs under the Municipality's development. If this integration proves successful and useful information becomes available, it will be incorporated into MOVE21 results from Bologna. The physical infrastructure of the bicycle hub will be funded through external sources.

With an analysis of the measures completed, the following action plan outlines how the Metropolitan City of Bologna, in collaboration with other pertinent partners, will proceed with replicating the *Park and Bike Node* measure from Gothenburg.

Table 8 – Bologna's Action Plan for measure 1

Action	Timeline	Responsible department/ organisation	Key attention points
Formal agreement related the building of the new cycle stations, their maintenance, and management	September 2023	CMBO Other involved: Local Municipalities	The Agreement is signed
Assignment of the work for the construction of the new cycle stations	October 2023	Local Municipalities – supervision by CMBO Others involved: Local Municipalities, private company in charge of building the new cycle stations	Work is formally assigned
Assignment of rights to use the areas where the new cycle stations will be built	October 2023	Railway operator (actual owner of the areas) – supervision by CMBO Others involved: Railway operator, local Municipalities	Rights to use the areas are assigned to local Municipalities
Call to individuate the private company in charge of operating and manage the new cycle stations, and develop the e-platform	November 2023	CMBO	Call is launched
Completion of construction work for the new cycle stations	December 2023	Private company in charge of building the new cycle stations - supervision by CMBO Others involved: Private company in charge of building the new cycle stations	Construction work is completed
Assignment to the private company in charge of operating and manage the new cycle stations, and	January 2024	CMBO Others involved: Private company in charge of operating and manage the new cycle stations, and	The private company is selected, and the development started

start activities for the e-platform developing		develop the e-platform, Municipality of Bologna	
Communication/marketing campaign to raise citizens and potential users' awareness. Wayfinding to improve easier orientation for bikers (panels, signals,…), and to enhance space identity and perceived safety	January 2024	CMBO Others involved: Local Municipalities, railway operator	Communication campaign, wayfinding and orientation are launched
Activation of the new cycle stations and e-platform to operate/manage related innovative services	February 2024	Private company in charge of operating and managing the new cycle stations, and development of the e-platform - supervision by CMBO	The new cycle stations are activated, and the related services have started
Meeting of the working group to evaluate the progress of the service and any corrective actions	June 2024	CMBO Others involved: Local Municipalities, SRM, railway operator, private companies in charge of building the new cycle stations, operating and manage, and develop the e-platform	The meeting took place and possible corrective measures were decided
Meeting of the working group to evaluate the progress of the service	October 2024	CMBO Others involved: Local Municipalities, railway operator, private companies in charge of building the new cycle stations, operating and manage, and develop the e-platform	The meeting took place
First results collection to evaluate replication progress	October 2024	CMBO Others involved: SRM, Private companies in charge of operating and manage the new cycle stations, local Municipalities	Measurement of relevant KPIs

7.4 Measure 2 - Cargo-waste co-freight - Analysis

This chapter provides the transferability and challenge analysis of the second measure selected for replication by the Metropolitan City of Bologna: *Cargo-waste co-freight* in Lindholmen (Gothenburg).

7.4.1 Transferability potential

The following table describes the transferability potential of the *Cargo-waste co-freight* in measure. The scoring criteria details are available in Annex B.

Table 9 – Bologna's transferability assessment for measure 2

Conditions for implementation	Score	Justification for answer
Staff availability	4	The available staff within the Metropolitan City of Bologna is enough to accomplish the activities needed to replicate the selected innovations. External staff (from partners) will be involved with a view to continuing the activity even beyond the duration of MOVE21.
The time needed for implementation	5	The time expected to be used to replicate the selected innovations is fine.
Governance related efforts	5	The Metropolitan City of Bologna has experience and capacity to coordinate activities and partners involved in replication of selected innovations.
Technical conditions required	4	The Metropolitan City of Bologna has the technical knowledge to replicate the selected innovations. Yet, further research activity is planned to investigate the correct procedure for proper disposal of waste material coming from bicycle repair and replacement of parts.
Financial framework	4	Available funds from MOVE21 are enough to make a small pilot of the measure, involving a small number of bike shops and workshops, in order to investigate and obtain results useful for the evaluation of the innovations' replication.
Legislative/regulatory framework	4	The legislative/regulatory framework will be the object of a specific study within the measure replication, more specifically about the correct procedure for waste material disposal coming from bicycle repair and replacement of parts.
Communication	4	The Metropolitan City of Bologna already has experience and capacity to communicate with potential stakeholders (bike shops and workshops). external partners will be involved in communication and networking with them, also in order to check and increase the accountability of the partners with a view to continuing the activity even beyond the duration of MOVE21.

As none of the conditions of implementation ranked below 3, no challenge analysis is necessary.

7.5 Measure 2 - Cargo-waste co-freight - Action Plan

Ahead of the development of the Action Plan the Metropolitan City of Bologna had a series of meetings with potential partners who criticality reported on the current disposal of waste material coming from bicycle repair and the replacement of parts. A common reflection on possible solutions was launched. The main organisation responsible for the replication will be the external partner (non-profit association)

under the supervision of CMBO. Other partners involved are (non-profit association), bike shops and workshops, and the Municipality of Bologna. Based on the measures' analysis carried out above, the following action plan is proposed for the selected measure on waste material disposal by cargo bike.

Table 10 – Bologna's Action Plan for measure 2

Action	Timeline	Responsible department/organisation	Key attention points
Market research to find the proper partner to implement the innovations' replication	Summer 2023	CMBO	Market research formally launched
Market research to find the proper partner to implement the innovations' replication	September 2023	CMBO – supported by External partner (non-profit association)	Market research concluded with the identification of the partner
Replication starts: activate network with stakeholders (bike shops and workshops), and research activity about the regulatory framework (more specifically about the correct procedure for recycling waste material coming from bicycle repair and replacement of parts).	September 2023	External partner (non-profit association) – supervision by CMBO Others involved: (non-profit association), bike shops and workshops, Municipality of Bologna	Network established
Meeting with stakeholders: deeper understanding of stakeholders' needs, requirements, and potentials barriers to be overcome	October 2023	CMBO External partner (non-profit association), bike shops and workshops	Meeting took place
Research activity about the regulatory framework (more specifically about the correct procedure for recycling waste material coming from bicycle repair and replacement of parts)	December 2023	External partner (non-profit association) – supervision by CMBO	Research concluded
Cargo-bike first round: raw material inbound + waste material in return	January 2024	External partner (non-profit association) – supervision by CMBO Others involved: External partner (non-profit association), bike shops and workshops	Cargo-bike first round accomplished
Meeting with stakeholders: first round assessment, and potential improvements	February 2024	CMBO Others involved: External partner (non-profit association), bike shops and workshops, Municipality of Bologna	Meeting took place

Cargo-bike second round: raw material inbound + waste material in return	May 2024	External partner (non-profit association) – supervision by CMBO Others involved: External partner (non-profit association), bike shops and workshops,	Cargo-bike second round accomplished
Meeting with stakeholders: second round assessment	June 2024	CMBO Others involved: External partner (non-profit association), bike shops and workshops, Municipality of Bologna	Meeting took place
Public local event at European Mobility Week in Bologna	September 2024	CMBO Others involved: External partner (non-profit association), bike shops and workshops	Public event took place
Cargo-bike third round: raw material inbound + waste material in return	September 2024	External partner (non-profit association) – supervision by CMBO Others involved: bike shops and workshops	Cargo-bike third round accomplished
First results collection to evaluate replication progress	October 2024	CMBO Other involved: External partner (non-profit association)	Measurement of relevant KPIs
Assessment of the conditions for continuing the measure beyond MOVE21: meeting with stakeholders	November 2024	CMBO Other involved: External partner (non-profit association), bike shops and workshops, Municipality of Bologna	Meeting took place

7.6 Measure 3 - Mobility Hub - Analysis

This chapter provides the transferability and challenge analysis of the third measure selected for replication by the Metropolitan city of Bologna, *Mobility Hub* Kaltenkircher Platz in Hamburg.

7.6.1 Transferability potential

The transferability potential of the measure is detailed in the table below. The detailed scoring criteria are available in Annex B.

Table 11 – Bologna's transferability assessment for measure 3

Conditions for implementation	Score	Justification for answer
Staff availability	4	The available staff within the Metropolitan city of Bologna is sufficient to accomplish the activities needed to replicate the selected innovations. External staff (from partners) will be involved with a view to continuing the activity even beyond the duration of MOVE21.
The time needed for implementation	5	Time expected to be used to replicate the selected innovations is sufficient and within the timeframe of the project.
Governance related efforts	2	The CMBO does not have the experience to find and involve all the potential stakeholders, in particular the logistic operators. For this reason, an external support is needed to cover this gap.
Technical conditions required	4	To date, no specific technical conditions are required to replicate the selected innovations. Should critical issues arise on this aspect, they will be addressed together with the external partners involved in replicating the measure.
Financial framework	4	Available funds from MOVE21 are enough to make a small pilot of the measure, including a small number of major events to replicate the selected innovations. Considering the strong interest shown at political level, during the setting up of the measure's scheme, possible further funds availability will be checked to increase the number of tests and thus collect more useful information about the effectiveness of the selected innovations' replication.
Legislative/regulatory framework	2	The contribution of external partners will be decisive in studying and assessing together with CMBO the legislative/regulatory framework in depth and solving any critical issues that may arise.
Communication	4	The Metropolitan city of Bologna already has experience and capacity to communicate the measures, more specifically to generic public and citizens, and the usual communication channels will be used. The activation of the service will be communicated in synergy with the promotional activity carried out to support each of the individual major event. Collaboration with external partners will be important to properly inform and involve logistics operators.

7.6.2 Main challenges expected

Bologna is anticipating two primary challenges. The first pertains to the legislative and regulatory framework. Addressing this, external assistance will play a crucial role in thoroughly comprehending the legislative and regulatory intricacies, as well as the prerequisites essential for executing the measure at the local level. Through an official tender process conducted by CMBO, an external partner will be chosen by November 2023. This partner will be tasked with studying and exploring the appropriate legislative and regulatory framework. By December 2023, the study on the legislative and regulatory framework is expected to be completed, shedding light on the necessary prerequisites for implementing the measure.

The second challenge revolves around governance-related endeavours. To address this, external assistance will be enlisted to establish a network of logistics operators who can potentially participate as stakeholders during significant events. In November 2023, after an official tender conducted by CMBO, an external partner will be chosen to spearhead the process of identifying and engaging logistic operators who might be interested in contributing as stakeholders during major events. By January 2024, the logistics operator network is targeted to be established.

7.7 Measure 3 - Mobility Hub - Action Plan

Based on the measures' analysis carried out above, the replication is foreseen in the following steps details in the plan below.

Table 12 – Bologna's Action Plan for measure 3

Action	Timeline	Responsible department/organisation	Key attention points
Market/context analysis to understand the conditions for the replication of the selected innovation: meetings with potential partners	July – August 2023	CMBO Others involved: Potential partners Piazza Grande, Altra Babele, Doc Servizi, Open Group, Dumbo etc.	Meetings took place
Selection of external partner in charge of management/operate the temporary (cargo)bike park area and facilities	September-October 2023	CMBO	Tender published
Selection of external partner in charge of management/operation of the temporary (cargo)bike park area and facilities, and start of the activities for the replication of the selected innovation	November 2023	CMBO Other involved: External partner	Partner selected and preliminary activity started
Deepening study of the legislative/regulatory framework necessary to set up temporary and equipped parking	December 2023	External partner – supervision of CMBO	Study accomplished
Definition of the business model for multi-functional and multi-user hub (contracts, operators, ownership)	December 2023	CMBO Other involved: External partner	Business model defined
Define logistic operators' network, as potential stakeholders for replication of selected innovations	January 2024	External partner 1 – supervision of CMBO Other involved: logistic operators	Logistic operators network set up
Temporary parking area and facilities (for micro mobility: (e)bike, (e)cargo bike, (e)scooters) in occasion of major	February - October 2024	CMBO Other involved: External partner, logistic operators	Major events took place, supported by the measure

events in the city and functional hubs at metropolitan level: replication of selected innovations			
First results collection to evaluate replication progress	October 2024	CMBO Other involved: External partner	Measurement of relevant KPIs
Assessment of the conditions for continuing the measure beyond MOVE21: meeting with stakeholders	November 2024	CMBO Others involved: External partner, logistic operators, Municipality of Bologna	Meeting took place

8 Replication Action Plan – Munich

8.1 Selected measures

The city of Munich selected three measures to replicate. The first one is the ***Neighbourhood hub*** developed by Hamburg in the Holstenstrasse. A previously vacant space was transformed into a multifunctional hub for the transport of parcels and goods to reduce traffic - deliveries and pick-ups with electric cargo bikes. The existing shortage of space was addressed with a multifunctional concept. A test site for innovative and sustainable last mile logistics processes (micro-hub and cargo bike delivery) was established. For Munich two main aspects are interesting: the co-existence of various logistics users in the same space and the business model for multi-functional and multi-user hub (contracts, operators, ownership status) which aims to function without project-linked funding.

In its replication, Munich will take into account logistic users employing cargo bikes across various business domains, including parcel delivery services (B2C), general goods delivery (B2B), and recycling goods collection, the concept envisions a shared hub space catering to multiple logistics users. For Munich this implies an innovative approach to spatial allocation within the hub's logistic zone. On the site of Munich's Viehhof (on Tumblinger Straße, south of the new Volkstheater), a new bike logistics hub is to be built that will not only include solutions for parcel logistics, but also provide a location for providers with new types of bike logistics solutions, e.g. in the area of general cargo or craft deliveries. In this way, new concepts and business models can be tested that can contribute to the goals of the Mobility Strategy 2035. The space belongs to the municipal department and is rented from the Viehhof (Slaughterhouse). The Park and Ride GmbH company indicated its willingness to operate the space. Currently, the administration is examining the possibility of commissioning P+R GmbH for this purpose. This measure has benefitted from great political support with the willingness to be able to present first results at the IAA MOBILITY[1] conference 2023 in Munich. For this reason, a close dialogue and exchanges with Hamburg happened earlier in the project which means that most of the replication happened in 2022 and 2023.

The second measure is the ***Park and Bike Node*** in Klippan, Gothenburg. In this measure developed by the Gothenburg Living Lab, car parks are converted into mobility hubs, using the existing environment and its conditions to promote zero-emission mobility for people. Efforts are put into guiding people towards shared mobility options and increasing the attractiveness of existing shared mobility solutions.

Munich is set to replicate the measure involving the enhancement of current mobility hubs and the creation of new ones. Notably, emphasis will be placed on augmenting the multimodal offerings, as well as making notable improvements for bicycles and shared micro mobility options within these hubs. This includes initiatives related to guidance, wayfinding, and enhancing visibility, as well as allocating space for e-scooter parking and installing information signs. Furthermore, Munich's replication strategy will place a secondary focus on implementing clear signalling and markings to establish a strong multimodal hub identity, merging car parking and bike facilities. Additionally, there will be concentrated efforts to bolster connections to public transport stops in the replication process. Ultimately this shall allow the city of Munich to meet the goal of having at least 100 and up to 200 mobility points in the city area by 2026 and to arrange them according to traffic law, which is a key objective for the city of Munich. Existing

[1] IAAMOBILITY is the International Motor Show Germany conference organised in Munich in 2023: https://www.iaa-mobility.com/en?gclid=CjwKCAjwrranBhAEEiwAzbhNtWPPj34TrcZC7ppYPVj5Reyw0wVfxKAmtdXzhRRjpWauV3CaiSrYvhoCU9oQAvD_BwE

mobility stations from projects CIVITAS ECCENTRIC and City2Share will be the basis for further developments inspired by Klippan.

The third measure chosen for replication is the ***Integration of micro-mobility with Public Transport***, which is currently implemented in Oslo. The main aim of this measure is to integrate micro-mobility with public transport to offer users a seamless multimodal experience and operators an easy-to-use solution, which makes it easy to switch from bus to bike, all in one app. The key social innovation of the measure developed in Oslo is the fact that it enables the public to combine the use of public transport with privately owned, on-demand micro-mobility. It also ensures a lower threshold for shared mobility.

For its replication Munich focuses on the app integration. The Münchner Verkehrsgesellschaft (MVG) is currently developing the mobility app "MVGO". Learning from Oslo will facilitate the process of integrating this app in a joint mobility platform managed by DEFAS, the online travel information system for the Greater Munich area. The goal is to have an integration of different mobility services and mobility providers for a greater user experience and easier-made multi-modal trips.

8.2 Measure 1 – Neighbourhood hub - Analysis

8.2.1 Transferability potential

The transferability potential of the first selected measure originally implemented in Hamburg - *Neighbourhood hub* Holstenstrasse - is detailed in the table below. The detailed scoring criteria are available in Annex B.

Table 13 – Munich's transferability assessment for measure 1

Conditions for implementation	Score	Justification for answer
Staff availability	4	Staff is available, but the city's internal economic transport team is currently being set up. Support from a municipal subsidiary is necessary for the operation of the hubs.
The time needed for implementation	4	Rapid implementation is expected as the City Council has passed a resolution to establish this micro hub. A first hub can be implemented in the period up to August 2023.
Governance related efforts	3	No experience with the implementation of logistics hubs so far, therefore it is necessary to learn from projects in other cities. In particular, contracts for the use and operation of the hub are new territory, as are the tender criteria and content for the construction of the infrastructure. The replication from Hamburg will do the groundwork here. However, initial experiences from the City2Share project are available.
Technical conditions required	3	Due to the first-time implementation, the technical knowledge has to be built up. Technical content can be accessed from project partner DB, which has already set up hubs.
Financial framework	4	Sufficient funds are available through various partners, including the state government of the Free State of Bavaria, but also through

		municipal funding of the pilot project. However, the amount of funding is limited and only start-up funding can be provided. Self-financing business models are required for scaling.
Legislative/regulatory framework	4	The financing conditions have been clarified by a resolution. Sufficient framework conditions are in place in the city for implementation. Nevertheless, more and more conditions are being worked out, such as the placement of logistics areas in public space.
Communication	4	There are very good contacts with logistics companies through a multi-stage participation process in the development of the urban logistics concept. There is also a very good willingness to communicate within the city to implement the project.
Availability of public space	2	The biggest barrier to implementation is the availability of space in public areas. In future, private property owners, for example car parks or housing associations, should also be approached.

8.2.2 Main challenges expected

Three conditions scored lower or equal to three. The first one concerns the governance related efforts. For the implementation, contracts for the operation of the hub (operating contract between the city as landowner and the municipal subsidiary as operator as well as user contracts between the municipal subsidiary and the logistics companies) were necessary. These contracts needed to be adapted and signed specifically for Munich.

The second challenge concerned the availability of public space. To tackle this issue internal city talks were held, and a space found and used for that purpose as of July 2022.

The final challenge concerns the technical conditions. To obtain the technical knowledge for the construction of such a hub, further information was needed to prepare the tender for the construction and the equipment of the containers. Key information was needed for the construction plans of the site for the construction of the necessary infrastructure, as well as the construction plans of the containers for the construction of the buildings. A close dialog with DB helped facing this challenge.

8.3 Measure 1 – Neighbourhood hub - Action Plan

Table 14 – Munich's Action Plan for measure 1

Action	Timeline	Responsible department/organisation	Key attention points
Creation of a concept for urban logistics in Munich.	In five stages, the discussions of the stakeholders are accompanied on the basis of the insights gained and ideas capable of consensus are successively developed.	City of Munich Department of Mobility Others involved: Prognos AG, Logistic companies	The creation of the concept was awarded to a service provider who has to fulfil key points.

Search for a suitable area for a hub.	The search for a site should be completed by the middle of 2022.	Department of Mobility, Markthallen München Others involved: Logistics companies	There is a target for when the area must be found.
Planning work to establish a bicycle logistics centre.	Preparation of the work in mid-2022.	Department of Mobility, P+R Park & Ride GmbH	Construction plans as well as building plans are the central results. The call for tenders is drafted on their basis.
Building of the hub by construction companies.	Construction of the hub from April 2023 until opening.	P+R Park & Ride GmbH Others involved: Construction company, container manufacturer	Construction is monitored with the criteria set out in the tender.
Commissioning with the operation of the bicycle logistics hub	Conclusion of the operating agreement as well as conclusion of the utilisation agreements until the opening.	P+R Park & Ride GmbH, Department of Mobility Others involved: Logistic companies	Commissioning of the bicycle logistics hub on the site of the Munich cattle yard, usage agreement with the logistics companies, operating agreement.
Bicycle logistics hub officially opened.	August 2023	Department of Mobility, P+R Park & Ride GmbH Others involved: Logistic companies, press reporter	Official opening event in the press and start of logistics companies with deliveries.
Evaluation of the replicated pioneer project as a basis for the planning of a hub network.	During the year 2023 until October 2024.	Department of Mobility Others involved: Logistic companies, evaluation of the pilot project	Assessment of emissions saved and plans for expansion. Reducing the volume of traffic caused by the transport of goods transport and offer climate-friendly solutions. Addressing the existing lack of space with a multifunctional concept that can be adapted and scaled.

8.4 Measure 2 – Park and Bike Node - Analysis

8.4.1 Transferability potential

The table below details the transferability assessment of the second chosen measure from Gothenburg *Park and Bike Node Klippan* is detailed below. The detailed scoring criteria are available in Annex B.

Table 15 – Munich's transferability assessment for measure 2

Conditions for implementation	Score	Justification for answer
Staff availability	4	By opting for the Shared Mobility sub-strategy, sufficient basic staff is available for both construction and traffic regulation planning (Department of Mobility) and construction (Department of Construction).
The time needed for implementation	4	The multiplication follows an existing implementation of up to 200 mobility points by 2026. The implementation of the pre-defined number of mobility points per year will start in mid-2023 with 64 nodes this year.
Governance related efforts	5	Sufficient expertise is available through the European research projects Civitas Eccentric, Smarter Together and City2Share.
Technical conditions required	4	Technical knowledge for implementation available from other, existing research projects. For the implementation, design criteria specifically adapted to the region were defined in a multi-stage process.
Financial framework	5	Sufficient funds available through previous City Council resolution.
Legislative /regulatory framework	3	There is a sufficient legal framework for the conversion of parking spaces. However, cooperation with micro-mobility providers is on a voluntary basis. Therefore, the city cannot directly control that providers create an offer on the infrastructure provided by the city in order to encourage the population to switch to sustainable mobility.
Communication	4	Citizen participation is carried out via an online tool. More staff is needed for direct participation. This is because it has been shown that citizen participation is necessary for acceptance in order to use public space differently and to change parking spaces.
Process chain for the implementation of hubs	3	The previous projects were all individual processes. These experiences must now be integrated into an overall process.

8.4.2 Main challenges expected

Two main challenges are expected for this replication. Firstly, an agreement must be reached with the micro-mobility providers to ensure that they provide a reliable infrastructure. This is especially true if they are not yet active in the urban area. For this, corresponding agreements for integration into local MaaS apps must be made and funding must be secured. This is a challenge in terms of legislative/regulatory frameworks. Secondly, in order to implement a mobility hub with the experiences from the previous projects and integrating the experience from Gothenburg, requires bringing together a Munich-specific implementation process with the different actors. This process must be defined in the city-wide strategy by the end of 2023 so that implementation can begin centrally.

8.5 Measure 2 – Park and Bike Node - Action Plan

The following tables details the action plan for the replication of the second measure. The Mobility Department of the city of Munich is the main responsible partner together with the mobility operator

Münchner Verkehrsgesellschaft mbH (MVG). Other partners will be involved in specific steps which are detailed in the table. By the end of 2022 Munich had already designed a first concept for the mobility points and identified the planning factors including the definition of types of mobility points and the definition of an integrated process.

Table 16 – Munich's Action Plan for measure 2

Action	Timeline	Responsible department/organisation	Key attention points
Designation of new mobility points in the first phase and transfer of existing points.	In different phases starting at the end of 2022 until the end of 2023.	Department of Mobility, Department of Construction, District Administration Office	Implementation plans with concrete location of the point and arrangement for the conversion of parking spaces.
Geofencing for utility control and parking management to control built-up areas.	To be carried out sequentially after the land has been redesignated.	Department of Mobility, Municipal traffic monitoring Other involved: Deutsche Bahn Connect GmbH	Digital as well as on-site control of the converted parking areas.
Quality standards for providers to increase the use of shared mobility.	To be carried out sequentially after the land has been redesignated.	Department of Mobility Others involved: Micromobility companies	Listing of the implementation standard and preparation of offers to the Mircomobility providers.
Integration into the local MaaS application.	To be carried out sequentially after the land has been redesignated.	Department of Mobility Others involved: Münchner Verkehrsgesellschaft mbH (MVG)	Interface concept for integration, including financing.
Evaluation Mobility points also for further scaling.	First assessment mid-2024.	Department of Mobility Other involved: Office for External Evaluation	Assessment report required.

8.6 Measure 3 – Integrating micro-mobility with Public Transport - Analysis

8.6.1 Transferability potential

The transferability potential of the third selected measure from Oslo - *Integrating micro-mobility with Public Transport* - is detailed in the table below. The detailed scoring criteria are available in Annex B.

Table 17 – Munich's transferability assessment for measure 3

Conditions for implementation	Score	Justification for answer
Staff availability	4	Sufficient City administration staff available thanks to the decision of the Shared Mobility sub-strategy. MVG, the municipal transport company, also has sufficient staff for the implementation as operator of the MaaS app.
The time needed for implementation	4	The implementation of the project within the timeframe is possible through clear decisions of the City Council.
Governance related efforts	4	Data transfer agreements and cooperation agreements are known and available in the local MaaS app thanks to the existing commitments.
Technical conditions required	4	Sufficient technical knowledge for the integration of mobility offers into the urban mobility platform (MVGO) is available. Interfaces and necessities are clearly identified. Nevertheless, active coordination is necessary, especially for scaling.
Financial framework	4	When integrating mobility services, costs are incurred in particular for the integration of the interfaces. Funds are available for this.
Legislative/regulatory framework	3	At the level of Munich, there is indeed a framework. Nevertheless, it is not possible to force providers to integrate, and the national implementation of the European Mobility Data Regulation is partly unclear.
Communication	4	The city of Munich is in good contact with the providers of micro-mobility. The municipal transport company as the implementing company also has good contacts. The local MaaS app also enjoys a high level of awareness among the population.

8.6.2 Main challenges expected

The main challenge identified for this measure is the legislative/regulatory framework. For the proper replication of this measure the European Mobility Data Regulation must be implemented on national level and discussed with the partners involved. In particular, the resulting obligations on both the public authority and provider side must be made clear. Central points are the non-discriminatory booking of all micro-mobility services and the barrier-free accessibility of the MaaS app.

8.7 Measure 3 – Integrating micro mobility with PT - Action Plan

Following action plan is foreseen for the third replication measure.

Table 18 – Munich's Action Plan for measure 3

Action	Timeline	Responsible department/organisation	Key attention points
Design and management of the institutional framework. Independent identity so that no data monopolies are created and the system is data secure and non-discriminatory.	Completion by mid-2024.	Department of Mobility Others involved: Münchner Verkehrsgesellschaft mbH (MVG), Bayerische Eisenbahngesellschaft mbH, Münchner Verkehrs- und Tarifverbund GmbH (MVV), Technical and legal advice Mobility platform	Setting the conditions in a resolution.
Provision and exchange of data via standardised digital interfaces (API) and integration of different mobility services and mobility providers.	Execution in the years 2022 to 2024.	Bayerische Eisenbahngesellschaft mbH, Münchner Verkehrsgesellschaft mbH Others involved: Micromobility companies	Define the interface concept.
Financing the development costs.	Implementation in 2023.	Department of Mobility Other involved: Münchner Verkehrsgesellschaft mbH (MVG)	Obtaining an implementation decision.
Further development of DEFAS Bavaria into an open mobility platform.	Pilot launch in March 2023.	Bayerische Eisenbahngesellschaft mbH Others involved: Micromobility companies	Number of integrated micromobility services.
MVG continued to develop its information media and customer interfaces.	The timetable for further integrations has not yet been set.	Münchner Verkehrsgesellschaft mbH (MVG) Others involved: Micromobility companies	Number of integrated micromobility services.

9 Replication Action Plan – Rome

9.1 Selected measures

Rome selected three measures to replicate in the framework of the MOVE21 project. The ***Park and Bike Node*** in Klippan Gothenburg is the inspiration for the first replication. Gothenburg implemented this measure with the objective to increase the multimodal supply and the enhancing the place identity. Furthermore, the service innovation is an essential aspect as the Node becomes a one stop e-shop for park and bike, which aims at improving the user experience and an easier orientation between different modes of transport.

From the measures developed in the test site in Klippan, the city of Rome will focus the replication on the improvement for bicycles and shared micro-mobility in the test site area which is the Basilica S.Paolo - Metro B station. The choice of the area Basilica S.Paolo (Metro B stop) is due to the presence of the following key elements:

- Bike Boxes
- Connection to Metro B
- Parcel Lockers
- Car Sharing (On the street: Via Gaspare Gozzi)
- Touristic Attraction Point of Interest (Basilica S. Paolo)
- Availability of Private Car Parking

In particular, Rome will undertake two primary replication activities: the first is associated with the introduction of a bike box service to encourage modal shift alongside Local Public Transport (LPT). The second involves a trial run of a cargo bike (CB) rental service aimed at integrating them with LPT, bike boxes, and parcel lockers. The developments in the San Paolo area are strategic due to the location in proximity to the new RSM headquarters. It thus shows necessary prerequisites to meet the project's goals. The integration of bicycle parking, cargo bikes, parcel lockers, public transport (TPL), and the metro represents a noteworthy advancement in terms of an integrated hub. The neighbouring Rome Tre University, which is a project partner, could potentially contribute in various ways. Opportunities for synergies between RSM and Roma Tre on diverse activities, including enhancements within the Living Lab, are feasible. This experience at Basilica San Paolo could be replicated at other nodes to establish a more extensive network of mobility hubs throughout Rome. Within the test site area, 36 bike boxes will be operational and accessible to users (as shown in Figure 4). These "bike boxes" constitute the foundational elements of the bike parking system. Users can securely park their bicycles inside a closed box, safeguarded from vandalism. The bike box will open upon the user's app request, subsequently closing with the bicycle inside. It will only reopen upon the same user's request via the app for retrieval, maintaining an option for online monitoring. The system will be linked to the data network to receive instructions from the web server and provide real-time status updates. Communication with the web server will be established through a secure connection.

Furthermore, the San Paolo area has a high population density and numerous businesses. The surge in e-commerce deliveries has prompted the recent installation of three parcel lockers (two from Amazon and one from Poste Italiane). The proposed area stands near the Green Area, Low Emission Zone (LEZ). However, the availability of loading/unloading zones is limited, leading to unlawful temporary parking with associated risks and inconveniences. Thus, this location is well-suited for experimenting with bicycle usage by regular users and cargo bikes for local distributors and e-commerce deliveries. A

temporary cargo bike rental station (one-year test) for deliveries will be implemented (target: logistic operators – supermarkets; their interest/requirements has to be investigated).

Rome thus expands Gothenburg's strategy of *Park and Bike Node* to cargo bikes. Besides a new public bike rental station, i.e., a pilot to encourage multi-modality by subsidising costs for car park users and cyclists will also be put in place. It should be noted that this replication measure is consistent with measure "5" of Rome's SULP (pending approval). This measure concerns the promotion of cycle-logistics with particular reference to the use of cargo bikes.

Figure 4: Bike boxes in Basilica San Paolo Metro B station

Finally, the Trastevere Hub, set to be considered in Rome's third replication measure, is also conveniently situated near Basilica San Paolo and could serve as a preliminary mini-network to explore avenues for broader citywide expansion. This approach seeks to emulate Gothenburg's strategy and subsequently upscale the measure at the city-wide level, but after the completion of the MOVE21 project.

The ***Emission Free Goods Transport*** measure from Oslo is the second measure selected by Rome for potential replication. Oslo is currently implementing a consolidation terminal for city logistics. This process holds key business model innovations. Notably in terms of the pricing model which is necessary for small and medium operators to adapt regulatory introductions like the Zero Emission Zone. It builds on making public or private areas available for consolidation of goods across different value chains, and on stakeholders operating within the same four walls. In terms of service innovation the measure also gives companies and citizens the opportunity to actively contribute to reduce traffic and pollution. Environmentally friendly vehicles that are suitable for urban life with a high load factor are further developed, and changes in the infrastructure to support consolidation and emission free vehicles are made (i.e. signage, markings, charging infrastructure). Finally, Oslo aims at developing governance innovations including public and private procurement to route through the hub. The City of Oslo Agency for Planning and Building Services is working on improvements to further integrate urban logistics, transport planning and urban planning in a more holistic manner.

Rome holds a keen interest in the progression of the Zero Emission Freight Zone initiative, as the city's objective is to achieve emission-free freight transport within a few years. It is worth emphasizing, as revealed during the MOVE21 Knowledge exchange with the Oslo Living Lab and explained in the transferability assessment above, that this undertaking requires several years for proper implementation, a fact corroborated by the City of Oslo's own experience.

The Tridente LTZ located in Rome's city centre is poised to evolve into an area where freight transportation incurs emission fees in the future. At present, pedestrian pathways have already been established to increase safety. At the same time, electric goods vehicles can operate within the area around the clock. The focus now shifts to shaping this area in terms of consolidation terminals and last-mile deliveries. While the immediate goal of rendering Tridente LTZ carbon-neutral may not be realized within the timeframe of MOVE21, a series of concerted efforts and initiatives will be directed toward this objective. Rome derives inspiration from Oslo's approach, albeit with the recognition that Oslo differs in scale and demonstrates heightened environmental conscientiousness. Nevertheless, Rome seeks to leverage Oslo's best practices to streamline its own trajectory.

Rome's strategy unfolds in two distinct avenues. Firstly, engaging in discussions with logistics operators, given the intricate nature of these dialogues hinging on production chains. To facilitate this, a Logistic Living Lab has been initiated to foster collaboration. Secondly, considering the perspective of the private citizen, which varies across different neighbourhoods of the city. This entails devising a comprehensive roadmap for addressing environmental concerns, with gradual application across different city segments. The city centre will lead the way. In terms of infrastructure, Rome adheres to a Mobility Plan dedicated to establishing new electric charging stations, even within the historic centre. Fundamentally, what Rome seeks to replicate from Oslo's successful practices is the spirit of dialogue and cooperation within the logistics chain to identify optimal pathways toward achieving zero emissions within Rome's core. The city aims to uphold three of Oslo's objectives:

- Attainment of zero emissions within the city centre. While this objective might not be fully realized during MOVE21, it remains a steadfast goal.
- Initiation of dialogue with logistics service companies in the city centre to drive decarbonization efforts.
- Enhancement of the charging network infrastructure, tailored to Rome's distinct characteristics. In addition, the city adheres to a freshly revamped e-mobility plan, slated to introduce approximately 150 new charging stations by 2025 in Rome's central area.

Lastly, it's noteworthy that this replication endeavour aligns with "Measure 2" of Rome's SULP, currently in the approval process. This measure concerns the revision of regulations pertaining to urban freight access in Rome. Further details can be found in Annex A.

The third selected measure is the ***Technical Guidelines for designing metropolitan Mobility Hubs*** which were originally developed in Bologna. Bologna's measure introduces three key innovative aspects. Firstly, it entails the development of a Metropolitan design tool tailored for individual local entities and communities, ensuring a coherent implementation of mobility hubs outlined within the SUMP. This initiative resulted in the creation of comprehensive Guidelines, facilitating the establishment of a protocol of understanding with national railway operators. Additionally, it led to the formation of a collaborative working group comprising diverse public entities from various administrative levels, working in tandem with the local mobility agency for public transport. This collaborative effort involved

both public and private sectors, uniting their resources to secure funding for the execution of measures delineated by the design tool. Lastly, a design competition was orchestrated as a concrete application of the formulated Guidelines, yielding valuable insights into the practical design process.

The mobility agency of the city of Rome is looking to develop *Technical Guidelines for designing metropolitan Mobility Hubs*, including a design tool to be taken as a reference by public-private entities in implementing a mobility hub. The replicated Guidelines shall:

- Define goals and challenges to create a coordinated network of mobility hubs.
- Identify each area of influence, main functions and project principles.
- Draw up different levels of measures and actions for each kind of mobility with specific designing operative directions.
- Build up public participation involving stakeholders, city users, citizens and a collaborative system of governance to ensure high reliability.
- Base design projects on social and economic sustainability.
- Create a corporate identity to recognize and enforce mobility hubs network.
- Follow best practices.

According to this approach, Rome intends to improve the existing stations (nodes) and increase the connection level (frequency) between them (network).

Figure 5: Rendering of redevelopment of Piazzale Flavio Biondo close to Trastevere station

Redevelopment of Piazzale Flavio Biondo (square) the opposite side of the Trastevere station in Rome is currently taking place. Piazzale Flavio Biondo HUB is the first example of a mobility hub in Rome.

The requalification of the square into a multimodal hub already started including:

- A central area dedicated to PT;
- Special pathways to connect the station and PT stops;
- The east part includes green areas, pedestrian areas, bike parking and car/bike sharing & recharging e-vehicles parking places;
- The presence of parking lots for loading and unloading goods;
- A Kiss & ride area;
- Dedicated lightening.

The project includes the construction of new 450-space car park in Piazzale della Radio, the new Tiber Park in Marconi, with a new play and fitness area and the renovation of the nearby “Ponte di Ferro” bridge. This project will be in close synergy with the SUMP of the Metropolitan City of Rome in which the locations of interurban and urban mobility hubs (connection points between “rail and road” modes, that is train and public buses) have been identified. Piazzale Flavio Biondo should be considered as metropolitan mobility hub more than a simple urban mobility hub since it exploits a broader area than the municipal one. Furthermore, this redevelopment project will benefit from the replications of MOVE21 since it may result in further mobility services for example new parcel lockers or improvements in the standards on guidance, wayfinding, and visibility.

9.2 Measure 1 Park and Bike Node - Analysis

9.2.1 Transferability potential

The detailed scoring criteria are available in Annex B.

Table 19 – Rome’s transferability assessment for measure 1

Conditions for implementation	Score	Justification for answer
Staff availability	4	Staff available from RSM and Roma Tre University.
The time needed for implementation	4	The city is confident about completing activities within the project timeline since there is staff available and preparatory work is already completed.
Governance related efforts	4	Even if the support from all the stakeholders is necessary, the Municipality can undertake all the coordination needed to set up this scheme.
Technical conditions required	4	RSM can support the municipality: It has the appropriate knowhow.
Financial framework	4	The costs (bike boxes and bike rental station) have already been financed. 24 Bike Boxes stations close to the metro stations have been financed by the National Recovery and Resilience Plan (NRRP) – MEF. The pilot test of seven Bike Box stations has been financed

		by PON Metro – a National Operative Program of Metropolitan Cities. The bike rental station with cargo bikes will be financed by MOVE21.
Legislative/regulatory framework	4	Regulations have been specifically developed.
Communication	4	RSM is planning a coordinated communication strategy on cycling.

There is no factor scoring below three for this measure, thus no specific challenges are expected.

9.3 Measure 1 – Park and Bike Node - Action Plan

Based on the measures' analysis carried out above, the table below outlines the action plan for the first selected measure. RSM will be the main organisation leading the tasks. Over May and June 2023 RSM already made an assessment for the integration of the new bicycle stations into the cargo bike (CB) network being developed by the municipality of Rome and did a market research to find the private CB company in charge of the service for the new bicycle station in the test site (Basilica San Paolo).

Table 20 – Rome's Action Plan for measure 2

Action	Timeline	Responsible department/ Organisation	Key attention points
Drafting the call for (expressions of) interest from private suppliers	September 2023	RSM	Dissemination of the CfI among private suppliers
Activation of the bike boxes and inauguration of the service	September 2023	Rome Municipality, RSM Other involved: ATAC	Close cooperation with the Sustainable Mobility Department and the Office of the Councillor on activation of seven bike boxes systems (Basilica San Paolo included) close to metro stations and inauguration of their service
Formal agreement on the service of the new CB station for one year (pilot test), its maintenance, and operation.	October 2023	RSM	Agreement signed
Activation of the new CB station and the electronic platform for the management of related innovative services	November 2023	Private company in charge of operating and managing the new cargo bike stations, and develop the e-platform - supervision by RSM Other involved: Private company in charge of operating and managing	New CB station activated in Basilica San Paolo; related services started

		the new cargo bike station.	
Communication/marketing campaign to raise citizens and potential users' awareness.	December 2023	RSM	Communication campaign for Basilica San Paolo test site launched
Meeting of the working group inside the Logistic Living Lab to evaluate the progress of the cargo bike service and any corrective actions	February/ March 2024	RSM, UR3 Others involved: Experts, private companies in charge of proving services for new cargo bike stations, operating and manage, and develop the e-platform	Meeting to take place and possible corrective measures decided
Survey / interviews to the users	July 2024	RSM, UR3	Survey / interviews will be carried out to find out the preference of users of both the bike boxes and the rental of Cargo bikes
Meeting of the working group inside the Living Lab to evaluate the progress of the cargo bike service	October 2024	RSM, UR3 Others involved: Experts, private companies in charge of proving services for new cargo bike stations, operating and manage, and develop the e-platform	Meeting results
First results collection to evaluate replication progress	October 2024	RSM, UR3 Other involved: Private companies in charge of operating and managing the new Cycling station	Measurement of relevant KPIs

9.4 Measure 2 - Emission Free Goods Transport - Analysis

9.4.1 Transferability potential

The transferability potential of the second selected measure *Emission Free Goods Transport* is detailed the table below. The detailed scoring criteria are available in Annex B.

Table 21 – Rome's transferability assessment for measure 2

Conditions for implementation	Score	Justification for answer
Staff availability	4	Staff is available from RSM and UR3.
The time needed for implementation	1	The main goals the city aims to reach will not be reached within the timeframe of the project.
Governance related efforts	4	In Rome there is a close link and strong commitment between national, regional and local policies in the environmental and congestion related issues.
Technical conditions required	4	This aspect does not create issues for the aim to reach emission free freight transport in Rome. The real obstacle to this measure is the long-term horizon.
Financial framework	2	This measure requires substantial funds to incentivise both passenger and freight transport to switch to less polluting vehicles. These do not only depend on the local level.
Legislative/ regulatory framework	3	The regulatory framework pertaining to restrictions on the most polluting Euro categories is contingent upon the willingness of owners of environmentally detrimental cars and trucks to transition to less polluting vehicles. Given the considerable size of this ownership demographic, it becomes imperative to allocate a substantial amount of funds to facilitate the necessary incentives.
Communication	4	The Municipality can properly communicate with all stakeholders and citizens.

9.4.2 Main challenges expected

Rome expects several challenges on the way to replicate the *Emission Free Goods Transport* measure**.** The first key challenge encountered is the time needed for implementation. In fact, implementing a full-scale emission free freight zone is very ambitious to be achieved in Rome. The process must be developed through a multi-year road map. Restrictions in terms of zero emissions are possible only with strong incentives for citizens and businesses to replace more polluting cars and with a large increase in terms of public transport offers (and alternative transport modes). Four aspects will be essential to ensure the success of the replication:

- The adoption of Rome's SULP.
- The activation of access control by new electronic gates.
- The pedestrianisation of Piazza di Spagna inside LTZ Tridente
- The revision of access rules for LTZ Tridente and the Design of LTZ Tridente as emission free freight area (the end of this point is beyond MOVE21).

The financial framework is the second key challenge. For the implication of this measure a great amount of funds to incentivise both passenger and freight transport operators to change to less pollutant vehicles have to be granted, yet those do not only depend on the local authorities.

The third challenge is linked to the second and regards the municipal budget. At the end of each year the municipal budget shall include funds to incentives to purchase zero emission vehicles. This allocation in the financial framework is paramount to ensure the zero emission freight zones can be fully effective.

9.5 Measure 2 – Emission Free Goods Transport - Action Plan

For the second replication measure Rome is very interested in processual aspects since the city's goal is to reach emission free freight transport in a few years' time. The following action plan focuses on the three elements outlined above in Rome's replication efforts during the lifetime of the MOVE21 project.

Table 22 – Rome's Action Plan for measure 2

Action	Timeline	Responsible department/ Organisation	Key attention points
SULP adoption in Rome Council by December 2023 (STEP 1).	December 2023	RSM Rome Sustainable Mobility Department and Mobility Councilor's office	Communication campaign
System Activation of Access control of LTZ with electronic gates to control traffic flows. (STEP 2)	December 2023	RSM	Communication campaign
SULP Presentation to logistic stakeholders within the Logistic Living Lab	January 2024	UR3 and RSM Logistic stakeholders	Meeting took place at political and technical level in joint with Rome measure 1 presentation
Gather knowledge and experiences, replicate relevant parts of the Oslo's best practices.	Iterative process with drafts and sections developed during 2023-2024 period.	RSM, UR3	First draft will be presented for round table in April 2024.
Piazza di Spagna inside ZTL Tridente will become accessible to pedestrians only. (STEP 3)	March 2024	Rome Sustainable Mobility Department and Mobility Councilor's office	Communication campaign
Meeting to present Oslo best practices and evaluate Design emission free freight LTZ Tridente	April 2024	UR3 and RSM Logistic stakeholders (carriers, citizens' association, retailers).	Meeting took place in Living Lab. Presentation on Oslo best practices will be carried out.

Working group to evaluate how freight should move within a ZEZ and to investigate how to distribute goods to the zone as well as within. This also includes how to enforce emission-free vehicles and reduce the total amount of vehicles.	May 2024	UR3 and RSM Logistic stakeholders	Meetings took place at political and technical level
Meeting to evaluate Design emission free freight LTZ Tridente according to the Rome SULP	October 2024	UR3 and RSM Logistic stakeholders (carriers, citizens' association, retailers).	Meeting in Logistic Living Lab will take place
Development of a feasibility plan (in terms of design) to transform Tridente Area in an Emission free freight transport area	October 2024	RSM and UR3	Report Delivery for the Rome Mobility Councilor's Office

9.6 Measure 3 – Guidelines for mobility hubs - Analysis

9.6.1 Transferability potential

The detailed scoring criteria are available in Annex B.

Table 23 – Rome's transferability assessment for measure 3

Conditions for implementation	Score	Justification for answer
Staff availability	4	Staff is available from RSM and UR3.
The time needed for implementation	5	Rome partners are confident to complete the replication on time since there is staff available and preparatory work is already completed.
Governance related efforts	4	Great influence for this replication activity comes from the technical experts so the Rome Municipality can undertake all the coordination needed to set up this scheme.
Technical conditions required	5	Even if the Municipality has not all the technical knowledge necessary to set up the scheme, the support from technical experts from the Rome Living Lab Laboratory can overcome this issue.
Financial framework	5	The theoretical approach of this measure needs experience rather than available funds.
Legislative/regulatory framework	4	The list of Mobility HUBs and their characterisation is present in the SUMP of the Metropolitan City of Rome. This regulatory document is public.
Communication	4	The Municipality can properly communicate with all stakeholders and citizens.

No major barriers have been identified in the transferability analysis.

9.7 Measure 3 - Technical Guidelines for metropolitan Mobility Hubs - Action Plan

For this measure the main responsible partners are the mobility agency (RSM) and the University Roma Tre while the other MOVE21 partners replicating the measure are invited to exchange experiences and knowledge.

Table 24 – Rome's Action Plan for measure 3

Action	Timeline	Responsible department/ organisation	Key attention points
Gap analysis to identify discrepancies and gaps between the Rome SUMP and SULP and the desired scope. Mapping relevant elements of Bologna's Guidelines.	September-December 2023	RSM, UR3	Synthetic report will be carried out by Nov. 2023
Adopt working plan to develop Technical Guidelines to include Mobility Hub Guideline aspects.	December 2023	RSM, UR3	Create working plan.
Activation of the new Mobility Hub of Piazzale Flavio Biondo (Trastevere)	December 2023	RSM	Reopening of the whole area in front of the access to Trastevere Station
Establish round table on creating technical handbook to include Mobility Hub Guideline aspects.	Established round table March 2024.	RSM, UR3	Working group presented for round table by March 2024.
Gather knowledge and experiences, replicate relevant parts of the Bologna Guidelines.	Iterative process with drafts and sections developed during 2024.	RSM, UR3	First draft will be presented for round table by august 2024.
Technical handbook presentation in the LL	October 2024	RSM, UR3	Meeting took place in Living Lab
Technical handbook sharing with Rome Municipality	Dec 2024	RSM	Sharing of the technical Handbook with Sustainable Mobility Department and and Mobility Councilor's office

10 Conclusions

One of the MOVE21 project's ambitions is to show that the tested measures can be applied in a different urban context thus proving their scalability to other urban nodes. All six MOVE21 Living Lab and Replicator Cities have identified measures and innovations from their peers that they will replicate. From the selection of measures, one understands the need to develop regulatory and planning frameworks which support the upscaling of mobility hubs.

Four out of five cities decided to replicate the *Technical Guidelines for metropolitan Mobility Hubs* developed by the Metropolitan City of Bologna. Those Guidelines help capitalising on the lessons learned of pilot hubs to draw general principles and identify guiding features for the design and planning of further hubs. This replication shall be closely followed up as it has the potential to show scalability at the European level. Most of the other replication measures focus on the governance and the service improvement of hubs which is the heart of the MOVE21 tested solutions.

Moreover, the integration of diverse mobility and logistics services stands at the core of the replication plans adopted by cities like Hamburg, Bologna, Munich, and Rome. When it comes to the replication initiatives chosen in the realm of urban logistics, several distinctions emerge. Hamburg, for instance, emphasizes service enhancements such as melding home delivery with public transport, while Rome concentrates on cargo bike rental services within pre-existing public transport hubs. Bologna, on the other hand, envisions novel waste disposal strategies. Integral to both Hamburg and Rome is integrating these services with public transport. The incorporation of cargo bikes is a common thread uniting the replications in Rome and Bologna. While urban logistics service innovations are slated for full implementation by the MOVE21 project's culmination, Rome's selection of a zero-emission logistics zone for its second replication measure may only be partially realized by project's end, primarily showcasing governance innovation replication.

A third category of selected replication measures encompasses the integration of mobility services within mobility hubs. These replications either accentuate supplementary services for bicycles with a notable focus on test measures within strategic zones, akin to the approach taken by Bologna, Munich, and Rome, or they manifest as service integrations within applications, as exemplified by Munich.

This deliverable describes how all the selected replication measures will be implemented and will thus serve as a roadmap to follow-up on the advancement of the replication. The Replication Action Plans will help the cities and the technical partners follow up on the replication of the chosen measures. The replication activities planned to support the cities and Living Labs in their endeavor to adapt the chosen measures to their local context have been outlined in this report as well. Each Replication Action Plan details key points to be monitored. WP7 will check on the advancement of those points each quarter during KEWs, and participants will be asked to provide a short update on the achieved steps, delays (if any) and outstanding steps.

The following table summarizes all the measure replicated in MOVE21:

Table 25 – Summary of replicated measures

Measure	Cities/Regions replicating the measure
Bologna – Technical Guidelines for metropolitan Mobility Hubs	Oslo, Gothenburg, Rome
Gothenburg - Park and Bike Node in Klippan	Bologna, Munich, Rome
Gothenburg - Cargo-waste co-freight in Lindholmen	Bologna
Hamburg - Neighbourhood hub in Holstenstrasse	Munich
Hamburg - Mobility Hub in Kaltenkircherplatz	Bologna
Oslo - Mobility on demand for people and freight	Hamburg
Oslo - Emission Free Goods Transport	Rome
Oslo - Integration of micro-mobility with Public Transport	Munich

Annex A - Background information about Rome's LEZ

In May 2022, the European Court of Justice ruled against Italy for non-compliance with Directive 2008/50 on ambient air quality for nitrogen dioxide NO2 in some Italian areas including Rome. This Sentence followed the 2020 Sentence for the 2014/2147 infringement procedure concerning PM10 also involving the city of Rome. COVID studies showed the dependence of NO2 concentrations from road traffic, particularly diesel-powered vehicles. In October 2022 the Lazio Region approved the update of the Regional Air quality Plan (PRQA Lazio) to achieve the legal limit values on air quality by 2025.
The Implementation Regulations of the PRQA update set out, among others, measures to limit vehicle traffic to be adopted by Municipal Administration.

The Rome Municipality Urban Sustainable Mobility Plan (SUMP) was approved on 22/02/2022.
SUMP objectives in Rome are the following ones:

- Improve integration of mobility resources
- Multimodality & reduction of private car ownership
- Safety levels increase for PT and road traffic
- Public transport capacity increase
- Soft & sharing mobility increase (car-pooling, car, bike, van sharing, mobility manager activities)
- Less congestion and atmospheric & acoustic pollution - energy consumption reduction – CO2

The Logistics Living Lab was planned in the SUMP as a permanent working group on urban logistics.

Rome has a city zoning in six areas with increasing constraints to private mobility and focusing on multimodal mobility with emphasis to soft modes, supported by ITS measures has been identified in the SUMP as showed in the following figure.

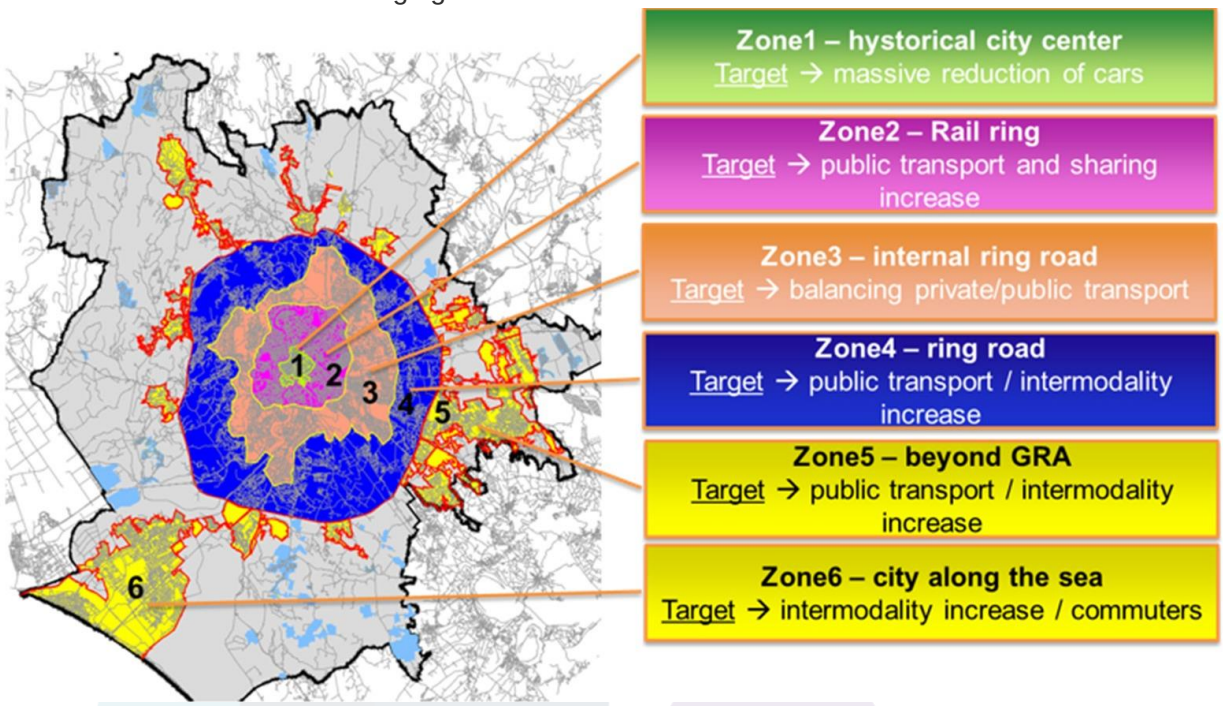

Figure 6: SUMP – Demand Management Policies: City zoning in 6 areas

The current status of the city's centre LTZs & electronic access control in Zone 1 is showed in the following figure:

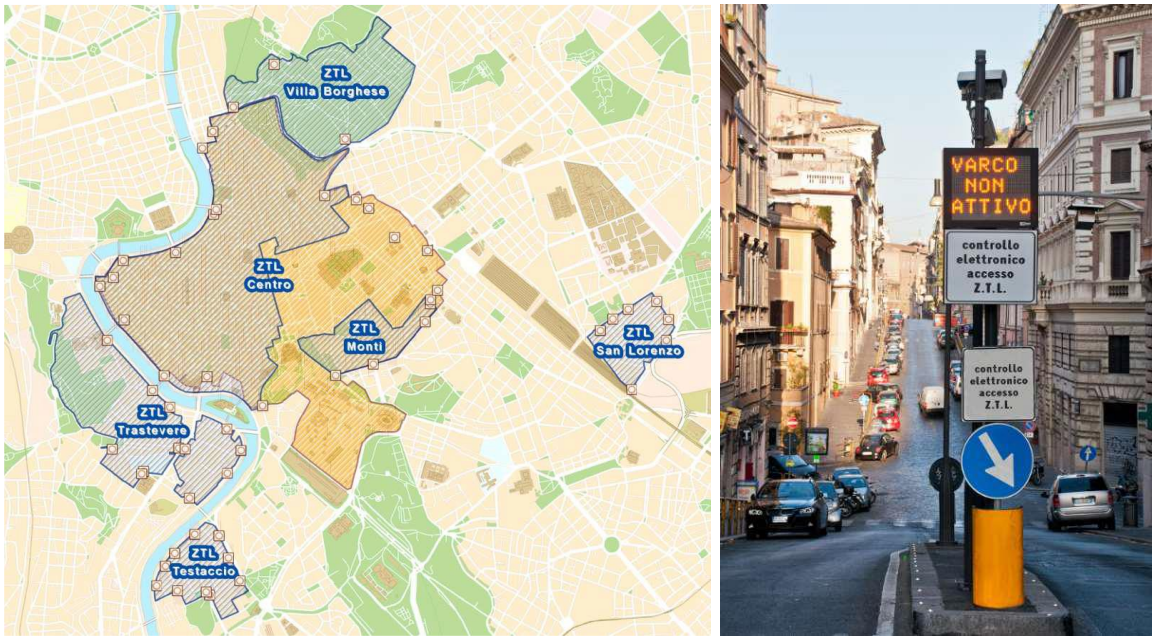

Figure 7: Zone 1: City Centre LTZs already fully controlled by electronic access control systems. In the adjacent figure an example of electronic gate equipment

Zone 1 is totally controlled by electronic gates since 1999 (Historical Center LTZ). The current Freight LTZ differs slightly from that of the Historical Center in terms of territorial extension. Moreover, RSM is implementing other two areas equipped with electronic gates: in zone 2 LTZ VAM will be protected by n. 67 electronic gates while in zone 3, Green Area Low Emission Zone will be protected with the first 80 electronic gates, whose installation will be completed by November 2023. As regards to Green Area LEZ, REACT-EU is funding the first batch of the e-gates project (8 ML€) including the System Data Centre, the first 80 electronic gates, whose installation will be completed by November 2023. Controls are carried out remotely by Urban Police while electronic systems are implemented, centralised, and maintained by RSM.

A Council Act approved the Green Area LEZ on November 10 (DGC 371/22) with progressive restriction according to vehicle Euro categories (freight transport included). However, a great discussion is arisen among citizens and local municipality about the limitation of free circulation that could involve 330 K citizens with Euro 3 and 4 private cars (i.e. about 14% of the total fleet in Rome) – RSM feasibility study.

Green Area Low Emission Zone: extension and limits
Surface: 156,18 kmq – 45% of the area inside the G.R.A.
Perimeter; 87,02 km

Tridente is an area of high historical and commercial value inside the LTZ Historical Center. It is controlled by 8 electronic gates (already in operation).

The time of validity of the LTZ Tridente is the following:

Mon. to Fri. 6.30 am - 7 pm
Sat. 10 pm – 7 pm
Fri. & Sat. 11 pm – 3 am
(except Bank holidays)
Loading and unloading operations until 11.30 am
Electric vehicle entrance: 24 hours

The electronic gates are operating according to the following time schedules:

- LTZ Historic Center
  Mon. to Fri. 6.30 am - 6 pm
  Sat. 2 pm – 6 pm
  Fri. & Sat. 11 pm – 3 am

- LTZ Trastevere
  Mon. to Fri. 6.30–10 am
  Fri. & Sat. 9,30pm–3am

- LTZ Villa Borghese
  Mon. to Sun. 0 –24

- LTZ San Lorenzo
  From Wed. to Sat. 9.30 pm – 3 am
  (May to July & September- October)
  Fri. & Sat. 9,30pm–3am
  (November – April)

- LTZ Testaccio
  Fri. & Sat. 9,30pm–3am

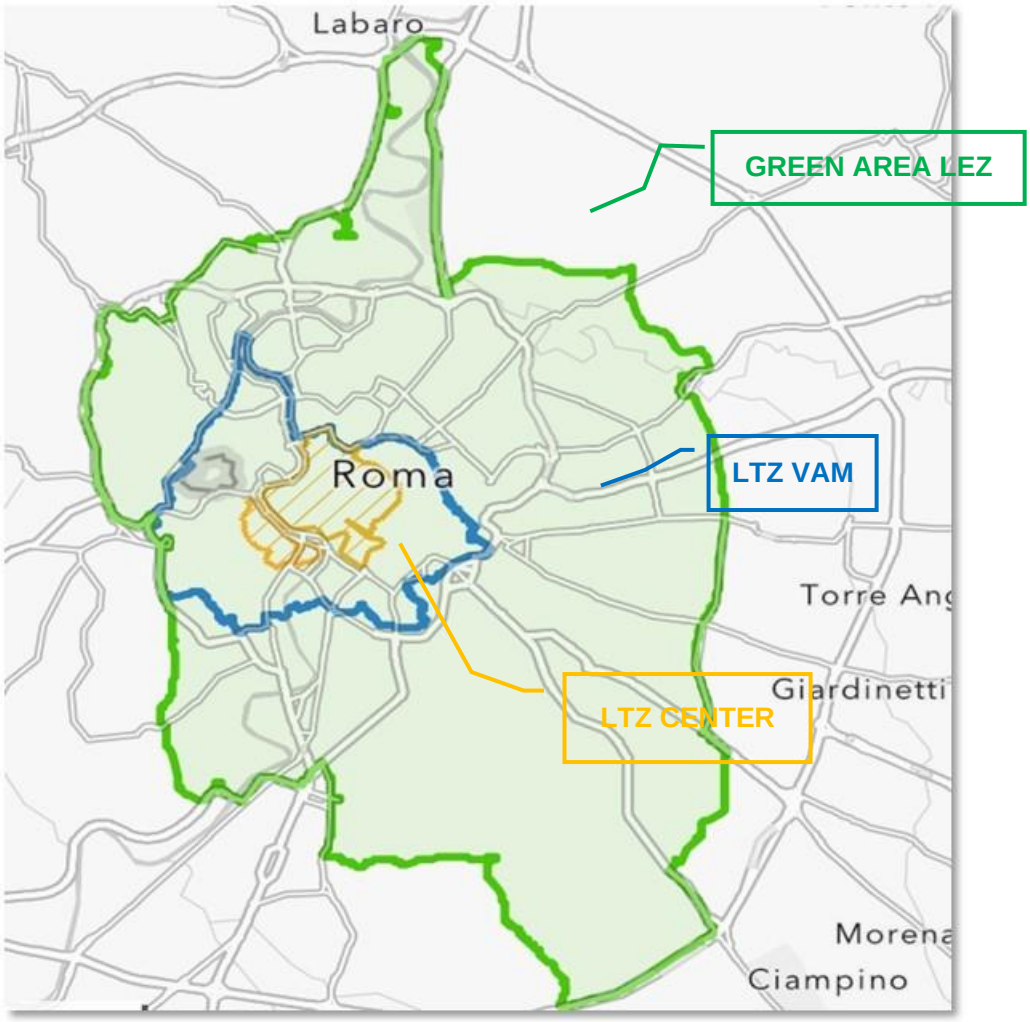

Figure 8: ZTL Historical Center – ZTL VAM – Green Area LEZ

The Figure belowe represents the Tridente map, in which the existing pedestrian areas are coloured in green. A Council Act (Del 300/2014) allowed access and loading and unloading of goods to electric-powered trucks without time restrictions on the roads inside the LTZ Tridente, without prejudice to the greater restrictions on pedestrian areas.

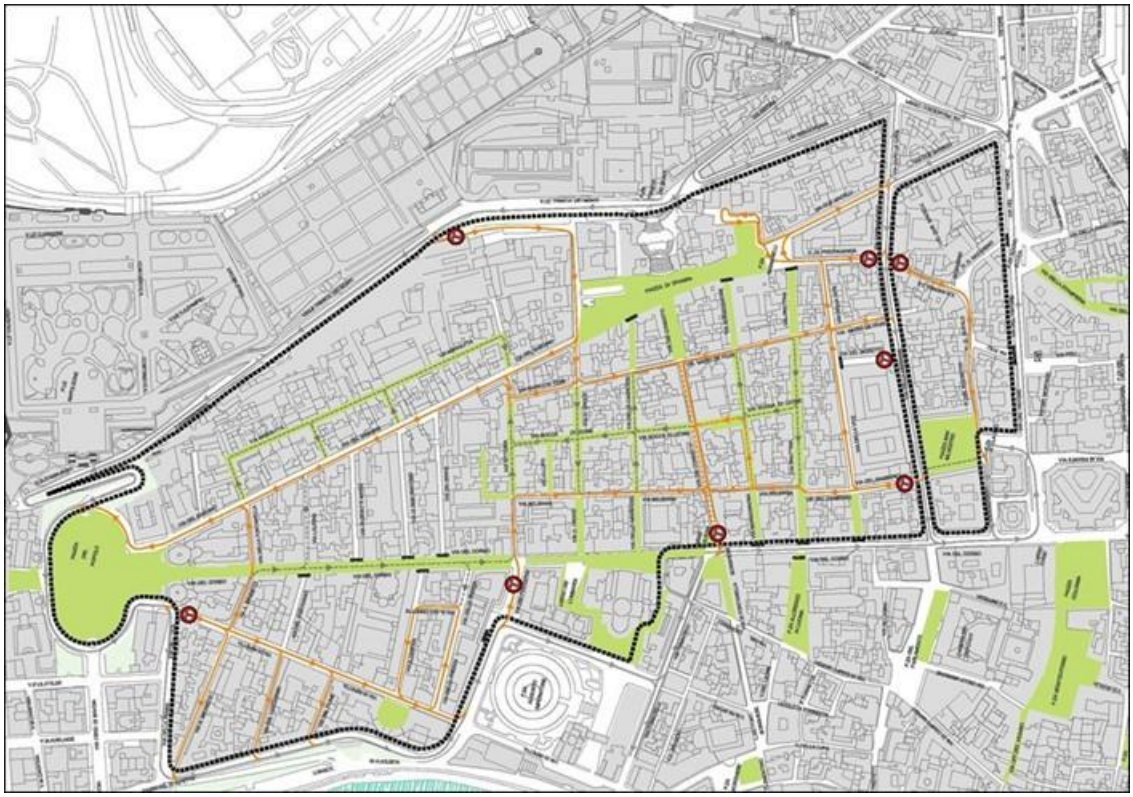

Figure 9: LTZ Tridente map

Annex B – Transferability assessment - scoring criteria

Conditions for implementation	Scoring criteria
Staff availability	1 – No staff available 5 – There are available staff
The time needed for implementation	1 – The time needed to set up the scheme is not realistic to my context 5 – The time needed to set up the scheme is perfectly fine
Governance related efforts	1 – The Municipality doesn't have the experience or capacity to undertake all the coordination needed with stakeholders 5 – The Municipality can undertake all the coordination needed to set up this scheme
Technical conditions required	1 – The Municipality/Metropolitan Area does not have the technical knowledge to set up the scheme and is not able to build capacity or get external support 5 – The Municipality has all the technical knowledge necessary to set up the scheme
Financial framework	1 – There are no funds available to set up the scheme, and no perspective of change 5 – The funds to set up the scheme are available
Legislative/regulatory framework	1 – There are no regulations, market maturity, or other frameworks in place to set up the scheme in my context 5 – Framework to set up the financing scheme is already in place
Communication	1 – The Municipality does not have the experience or capacity to establish communication with stakeholders, citizens, etc. 5 – The Municipality can properly communicate with all stakeholders and citizens