CAPACITY BUILDING AND REPLICATION MASTER PLAN

Project deliverable D7.1

Version number: Final
Date for release: 29/06/2022

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MOVE21 – Multimodal and Interconnected Hubs for Freight and Passenger Transport Contributing to a Zero-Emission 21st Century

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 953939

Deliverable administrative information

Deliverable administration					
Grant agreement	953939	**Project short name**	MOVE21		
Deliverable no.	D7.1	**Name**	Capacity Building and Replication Master Plan		
Status	Final	**Due**	M14	**Date**	29/06/2022
Authors	Anne-Charlotte Trapp & Lucian Zagan (Eurocities)				
Related tasks	T7.1				
Dissemination level	Public				

Document history	Version	Date	Submitted	Reviewed	Comments
	0.1	09/06/2022	Anne-Charlotte Trapp & Lucian Zagan		Submitted for review
	0.2	20/06/2022	Lucian Zagan	Jan-Hendrik Müller (City of Munich)	City of Munich's comments have been incorporated in Chapter 3
	0.3	27/06/2022	Lucian Zagan	Geiske Bouma (TNO) & Maria Morfoulaki (CERTH)	Reviewers' suggestions and comments have been incorporated throughout the deliverable; final draft submitted to the project coordinators
	1.0	29/06/2022	Lucian Zagan	Tiina Ruohonen & Paal Mork (City of Oslo)	Coordinators' suggestions and comments have been incorporated throughout the deliverable; final version formally submitted

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Project executive summary

The main objective of MOVE 21 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

The MOVE21 Capacity Building and Replication Master Plan provides the general framework for capacity building and replication activities. It outlines the replication approach and the extensive knowledge exchange and capacity building activities facilitating replication. Moreover, the deliverable maps and analyses the challenges, learning needs, and replication interests in the community of practice established within the project and consisting of representatives from all six urban nodes. At the same time, it provides concrete indications about future knowledge exchange and capacity building activities as a way of supporting replication.

Keywords

Replication, knowledge exchange, capacity building, community of practice, needs assessment, multimodal hubs, mobility-as-a-service, urban logistics, incentivisation and nudging, TEN-T integration

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List of abbreviations and acronyms

Acronym	Meaning
CoP	Community of Practice
FUA	Functional Urban Area
GA	Grant Agreement
ICCP	Innovation Co-Creation Partnership
KPI	Key Performance Indicator
LEZ	Low-Emission Zone
LL	Living Lab
LTZ	Low-Traffic Zone
MaaS	Mobility-as-a-Service
P+R	Park-and-Ride
SULP	Sustainable Urban Logistics Plan
TEN-T	Trans-European Transport Network
WP	Work Package
ZEZ	Zero-Emission Zone

1 Purpose of the deliverable

Work package 7 in MOVE21 is dedicated to replication and take-up. It brings together the living lab cities – Oslo, Gothenburg, and Hamburg – and three replicator cities – Munich, Bologna, 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. More, at a later stage, MOVE21 will engage a pool of interested and committed cascade cities that will participate in selected activities within the community of practice and will have a key role in the validation of guidelines and policy recommendation.

The main aim of the *Capacity Building and Replication Master Plan* is to provide the general framework for capacity building and replication activities. It outlines the replication approach and the extensive knowledge exchange and capacity building activities supporting replication. Moreover, the deliverable maps and analyses the challenges, learning needs, and replication interests in the community of practice established within the project. At the same time, it provides concrete indications about future knowledge exchange and capacity building activities as a way of supporting replication and a clear timeline for replication activities.

1.1 Attainment of the objectives and explanation of deviations

The objectives related to this deliverable have been achieved in full and as initially scheduled. Still, 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. Due to the restrictions related to the COVID-19 pandemics, these were not possible and the study visit in Hamburg happened in May 2022 and the ones in Oslo and Gothenburg are planned to happen jointly in September 2022. As these visits are mostly intended to help the cities draft their replication action plans (D7.2, due by August 2023), it is presumed that this slight delay has no significant impact on the present master plan.

1.2 Intended audience

As the present deliverable outlines the overall replication strategy, as well as offers guidelines for the cities' replication work along the timeframe of the MOVE21 project, the primary audience is constituted by the representatives of the local consortia in the living lab and replicator cities. At the same time, replication is facilitated by knowledge exchange and capacity building and partners across the consortium contribute to these activities; therefore, the deliverable also addresses them, with the purpose of coordination. At the stage when cascade cities will join the project activities, this deliverable will offer a quick overview of the structure of the knowledge exchange, capacity building, and replication activities. Yet, as a public deliverable, the *Capacity Building and Replication Master Plan* allows a wider audience of urban authorities, policy makers, researchers, and other interested parties to get an understanding of the current challenges and needs in the six MOVE21 cities and of how the project addresses them in its knowledge exchange and capacity building programme.

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

Chapter 1 outlines the purpose of the deliverable, identifies the intended audience, and comments on the alignment with the initial objectives and plans, as detailed in the MOVE21 Grant Agreement. Chapter 2 presents the replication approach in MOVE21 and the structure of the knowledge exchange and capacity building activities put forward to facilitate replication. Chapter 3 offers an analysis of the challenges, learning needs, and replication interests in the living lab and replicator cities based on the results of a targeted survey and an in-person cities' session (that took place in Hamburg on 3-4 May

2022) dedicated to validating the replication approach and to setting concrete targets for the replication activities, in synergy with the activities in the other WPs. Finally, chapter 4 maps future actions, while providing concrete indications about potential knowledge exchange and capacity building activities as a way of supporting replication, based both on the cities' interests and needs and on the existing expertise and interests among the technical partners in the consortium. At the same time, it draws a clear timeline for the main milestones of the replication activities. The closing chapter brings everything together and draws a number of conclusions.

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 integration that constitutes a significant input for knowledge exchange and capacity building 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 extensive knowledge exchange and capacity building programme that is put forward to facilitate replication is 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, and WP5: Technological Solutions and Integration – are expected to contribute substantially to the various types of activities in the community of practice. 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 constrained by the KPIs assumed at project level and monitored by WP8. At the same time, 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. That creates a direct link with exploitation tasks, managed in WP9, and outreach and dissemination activities, coordinated in WP10.

The contents of deliverables developed in WPs 3-5, in particular D3.1, D4.1, D5.1, and consolidated in the integrated city assessments in D6.2, D6.3, and D6.4 were considered both in the design of the capacity building and replication needs assessment and in the present deliverable. Deliverable D7.2, which is due in August 2023, will build on the present master plan and will detail the city-specific replication action plans of living lab and replicator cities. Deliverable D7.3, due in August 2024, will detail the city-specific action plans to prepare the transferability of selected measures to cascade cities. The results of WP6 and WP7 will inform the SUMP guide with policy recommendations (D10.7), due in March 2025.

2 Replication approach in MOVE21

2.1 The MOVE21 community of practice

MOVE21 uses a range of knowledge sharing, capacity building, and replication methods to work in a coordinated way to leverage the transferability of solutions and facilitate the adoption of innovative practices. At the heart of the overall approach is the establishment of a community of practice among the three living lab cities and the three replicator cities, where the knowledge generated in the living labs and through the local ICCPs will be shared with the replicator cities and interaction and exchange will allow them to work closely together and cross-fertilise. More, replicator cities themselves come with a wide experience of testing innovative mobility solutions and approaches and that will contribute to the two-way exchange process in a relevant way. At the same time, existing technical expertise and practical knowledge across the consortium partners and knowledge or tools generated by different WPs within the project feed the capacity building activities in the community of practice. To support wider replication and take-up, the project designed a cascade cities programme, which provides peer learning and selected capacity building opportunities for the committed cities. This will allow the knowledge generated within the community of practice to be transferred to another layer of cities, with the purpose of validation of guidelines and policy recommendation and wider impact.

As such, the MOVE21 project has established a community of practice which is composed by three layers of cities, with different levels of commitment. The structure of the community of practice is as follows:

- **Living lab cities**: Oslo, Gothenburg, Hamburg
- **Replicator cities**: Munich, Bologna, Rome
- **Cascade cities**: Bilbao, Murcia, Sofia, Stockholm, Thessaloniki, Toulouse.

2.2 Knowledge exchange and capacity building facilitating replication

Knowledge exchange is based on a peer-to-peer learning methodology. Peer-to-peer learning is an excellent instrument for improving the implementation of cities' policies and strategies or their practices. It is based on the idea that people who work on similar issues in different contexts, have similar roles and professional backgrounds, and face similar challenges in their cities can share experiences and learn from each other. To be in a peer situation, one has to be willing to share information, willing to learn, open to questions, and open to highlight encountered difficulties. Peers can be city experts, decision makers, practitioners, or other local stakeholders. They share a common understanding and interest in implementing sustainable urban mobility projects and policies in their cities. In many ways, they face similar challenges, need to find solutions to similar problems, have the same knowledge questions, and look for corresponding solutions, insights, and alliances. Hence, sharing experiences and solutions with each other can help them to improve their projects or strategies, organisational structures, or practices.

Capacity building describes the process which enables individuals and organisations to increase their knowledge skills and adapt their practices to act upon the challenges they face in their professional field. It is primarily a learning process which differs from the purely delivering of knowledge or good practices in its participatory, engaged, and interactive character. Capacity building activities in MOVE21 are intended to address the learning needs within the community of practice.

Both knowledge exchange and capacity building can be delivered in a number of formats: from webinars (an online meeting for the exchange of knowledge) and in-person meetings (framed as exchange

workshops or training sessions) to study visits (an on-site exchange method) or online courses (pre-recorded presentations organised in a coherent package).

MOVE21 puts forward an ambitious knowledge exchange and capacity building programme to support replication. It includes various activity formats, complementing each other and responding to various needs. As the figure below shows, they are structured as knowledge exchange, capacity building, or replication activities.

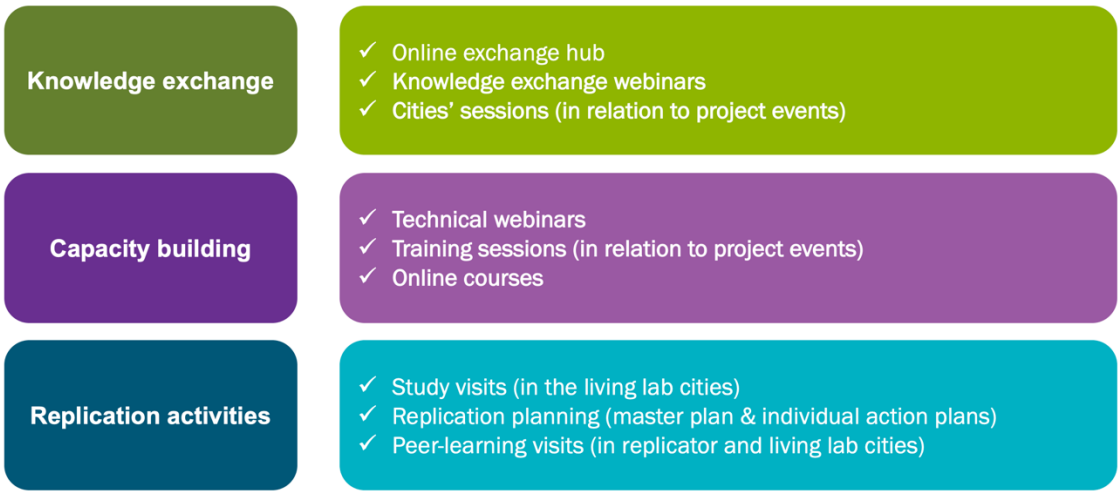

Figure 1: The structure of the activities in the community of practice

The table below details each of these activities, outlining their aims, methods and formats to be deployed, intended audience, and indicative frequency and/or timeline.

Table 1: Knowledge exchange, capacity building, and replication methods to be deployed

Method	Description of activities
Online exchange	The online exchange hub is a personalised, secure space for the community of practice and features a discussion forum, a collaboration and co-editing space, a meetings calendar, personalised notifications, and news feeds. It is the hub for the knowledge exchange activities and it is integrated with the project general document repository.
Knowledge exchange webinars	Quarterly webinars in which update on implementation progress in the living lab and replicator cities, receive tailored advice from peers and experts in all WPs, exchange between cities on barriers and drivers, connect challenges and create synergies. The webinars have a structured agenda and are facilitated by different consortium partners.
Cities' sessions	A full day devoted to the cities is to be organised every year in conjunction with annual consortium meetings or other project meetings to discuss in an in-depth way the status of implementations, challenges, solutions, and synergies. Honest exchanges are encouraged and one Cities Fuck-Up Night event will be organised in order to learn from failures (own and others).

Study visits	The replication framework is a two-way process for all cities to learn and replicate from each other. Introductory study visits were planned to each living lab for the first year of the project, but due to restrictions having to do with the COVID-19 pandemics they had to be slightly postponed. As a result, they are planned as such: Hamburg in May 2022 and Oslo and Gothenburg in September 2022. These visits are aimed at facilitating initial contact between cities, helping them refine and identify specific solutions to replicate and draft their replication action plan. The visits are facilitated by one or several experts and feature a feedback session for reflection and exchange.
Technical webinars	Six technical webinars are to be organised to focus on technical aspects of the implementations. Inputs from various WPs as well as from external experts might be sought to bring a more varied perspective to MOVE21 and establish synergies with other projects and initiatives. Open to all.
Training sessions	Three in-person training sessions are to be organised alongside the two Urban Nodes Forums (WP10) and one consortium meeting to engage with highly skilled experts on specific pre-identified topics that will be mapped through the needs assessment survey or during the knowledge exchange webinars. Open to all.
Online courses	Three online courses are to be prepared and made available on the exchange hub featuring a coherent package of presentations, videos, tools, and interviews on cross-cutting topics that are relevant for the replication of MOVE21 solutions. Open to all.
Peer-learning visits	Building on the introductory study visits, six peer-learning visits are be organised in each of the six MOVE21 cities. These provide support for the replication of successful solutions during the second, third, and fourth year of the project. Each visit is facilitated by one or several experts and features a peer-review session for structured feedback on the replication progress.

2.3 Replication approach

2.3.1 Replication 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. It involves the use of lessons learned from pilots and demonstrations and applying them elsewhere. MOVE21 engaged into 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. As described above, 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, asses their transferability conditions, and accelerating their take-up.

As living lab cities, Oslo, Gothenburg, and Hamburg co-create, test, implement, and upscale measures and policies. The replication in MOVE21 will be mainly based on the solutions co-created and demonstrated in the living labs, but demonstrated innovation in the replicator cities, shared within the MOVE21 community of practice (CoP), will also feed the process. 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. Still, as already mentioned, replication in MOVE21 is a two-way process and relevant experience from the replicators' cities can be also used during the replication process, all cities being allowed 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 intensive peer-learning and capacity building activities. Figure 2 below represents the concept that underscores the replication activities in MOVE21.

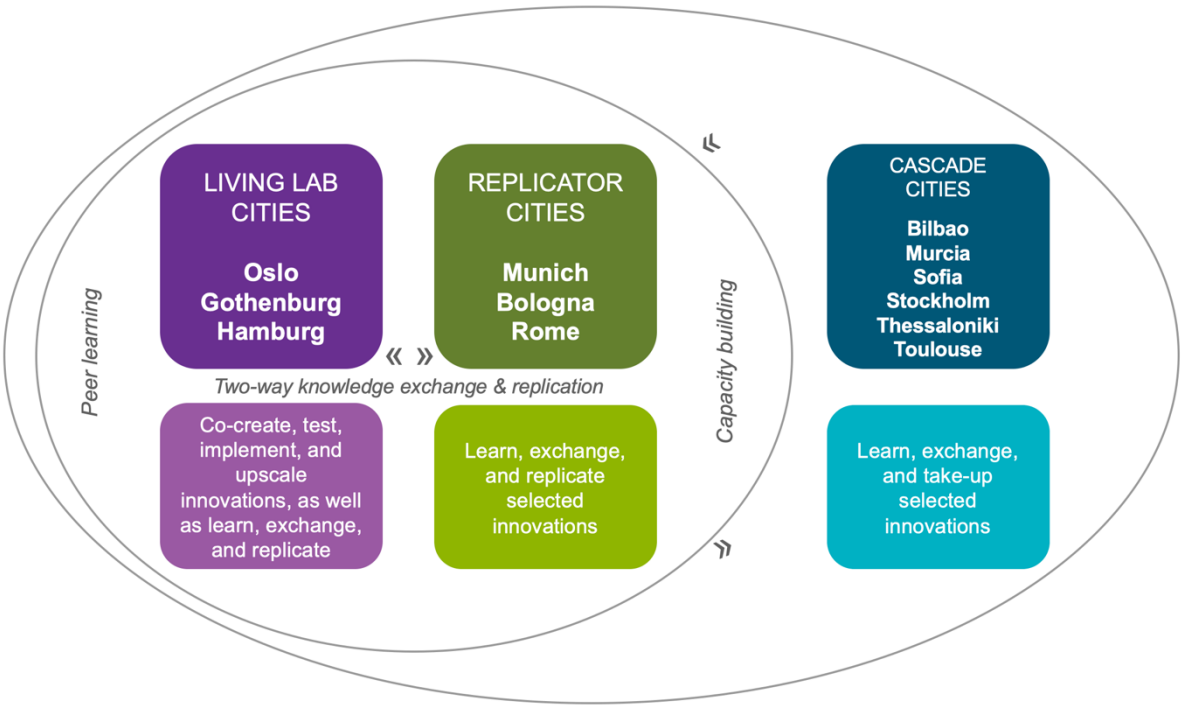

Figure 2: Replication concept in MOVE21

2.3.2 Replication outcomes

Considering the timeframe of the project and the available resources, it is projected that at least 12 innovations will be replicated in the six cities. That amounts to the fact that each of the three replicator cities will replicate at least three successfully tested innovations from another city and each of the three LL cities will replicate at least one such innovation. These targets are reflected 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)
- 2.3. Increase in active modes of transport thanks to incentive models / reward schemes: +10% (2025)
- 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)

- 3.7. Reduced number of heavy (freight) vehicles in circulation as a result of the implementation: -4%
- 3.9. Increase in public transport use: +15% (2025)
- 3.10. Increase in charging stations: +5% (2025)
- 3.12. Increased collaboration level between public-private entities and between transport domains in all collaboration cities / functional urban areas: 5 on a 1-5 scale (2025)
- 4.1. Perceived improved understanding of governance drivers and barriers to implementation of measures: 4.5 on a 1-5 scale (2025)
- 4.2. Number of sets of policy solutions implemented for ensuring the successful establishment of MOVE21 mobility hubs and/or solutions: 6 policy or administrative decisions (2024)
- 4.3. Number of MOVE21 business models developed: +6 (2025)
- 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 should focus on and the expected impacts of these activities.

3 Capacity building and replication needs assessment

Between February and March 2022, a detailed needs assessment was run amongst all the living lab and replicator cities to determine their interests and the key themes the capacity building and replication activities should build on. The needs assessment was based on an online survey (see Annex 1) all six cities filled out and it was followed by a cities' session on 3-4 May 2022, where the results of the survey were presented and discussed to reach an agreement on the main themes to be covered. At that occasion, cities were able to further specify their specific interests and synergies were identified between the six cities to identify preliminary replication interest.

While the integrated city assessments (D6.2, D6.3, and D6.4) provide initial insights on the contextual factors that need to be considered or altered for the development and deployment of the MOVE21 solutions – by looking at the urban social layer (WP3), governance innovation (WP4), and technological solutions and integration (WP5), this capacity building and replication needs analysis puts the focus on selected context conditions and their related challenges in each of the cities part of the MOVE21 community of practice. Those factors are considered in the light of the potential they bear for learning and exchange within the community of practice.

The present chapter provides details and an analysis of the main themes that emerged as fundamental work themes for the community of practice. For each of the themes, the baseline for the cities and the challenges faced are analysed, the specific capacity building interests of each city detailed, and the preliminary replication interests identified.

3.1 Horizontal and vertical priority themes

The needs assessment and the cities' session allowed the identification and prioritisation of the main themes that cities intend to work on in the framework of the capacity building and replication tasks in MOVE21. Therefore, the activities that are organised under WP7 are focussing on those themes and selected expert inputs from WPs 3, 4, 5, 6, and other work packages are provided.

The main three vertical themes that were consolidated as a result of the cities' needs assessment are:

1. Multimodal hubs for people and goods
2. Sustainable urban logistics planning and regulation
3. Mobility-as-a-service (MaaS).

Besides these, two transversal themes emerged: incentivisation and nudging, on one side, and TEN-T integration. The subsequent chapters specify the challenges faced in relation to these themes and identify the concrete needs to be tackled for each of the themes for the cities involved in MOVE21. Finally, the preliminary replication interest will be outlined, highlighting some pre-selected measures the cities envisage to replicate from their peers.

VERTICAL THEMES		
Multimodal hubs for people and goods	**Sustainable urban logistics planning and regulation**	**Mobility-as-a-Service (MaaS)**
Strong focus in: Oslo, Hamburg, Gothenburg, Munich, Bologna, Rome	*Strong focus in: Oslo, Hamburg, Gothenburg, Rome, Munich*	*Strong focus in: Oslo, Hamburg, Gothenburg, Bologna, Munich, Rome*
TRANSVERSAL THEMES		
Incentivisation & nudging		
TEN-T integration		

Figure 3: Vertical and transversal themes for capacity building and replication

3.2 Multimodal hubs for people and goods

The topic of multimodal hubs for people and goods is at the core of the MOVE21 project and thus received a clear interest from all the cities to further exchange and build capacity on specific aspects pertaining to the theme. This will allow the LL cities to find support in the development of the hubs specified in their implementation plans and replicator cities to learn from them simultaneously and to replicate the innovations that prove successful. The cascade cities will finally benefit from the knowledge gathered within the community of practice on mobility hubs for people and goods to be able to initiate their work on that topic as well.

3.2.1 Baseline and challenges on multimodal hubs for people and goods

When looking at the capacity building and replication needs on multimodal hubs for people and goods, it is important to seize the variety of understandings of the concept of a hub. Among the community of practice, not all cities share the same baseline understanding or typology of hubs. There are cities that do not have a clear definition or a particular typology applied. This is the case for both Gothenburg, that does not have a city-wide accepted definition or typology, and the city of Rome, where the metropolitan SULP, currently under elaboration, will further define the scope and typology of hubs. In Hamburg, as for Gothenburg, no city-wide shared definition or typology is available yet, but some districts, e.g. Altona, have defined their ideal type of multimodal hubs. On a general understanding, a core characteristic of hubs is the bundling of more than one shared mode of transport in one place.

> *"In Munich, we define a mobility hub as a designated point where various climate-friendly and shared mobility services are bundled in one place. In addition to its organisational function, this also improves the visibility and reliability of these vehicles and offers an alternative to private cars in combination with public transport. A mobility hub can therefore serve as a transfer point between public transport and shared mobility services such as car sharing, bike sharing (conventional, electric, or cargo bike), shared micro-mobility (e.g. electric scooters or e-mopeds), and on-demand services." (Munich's response to the MOVE21 Capacity Building and Replication Needs Assessment Survey)*

Furthermore, the City of Munich emphasises that their "mobility points" need to be designed in conjunction with surrounding areas and integrated both physically and digitally. Similarly, in Bologna, architectural and design improvements are considered when developing mobility hubs.

Finally, and beyond that, some cities stress the necessity to consider the multimodal hubs beyond their transport function. For Bologna and Munich, multimodal hubs include possible further additions such as greening, shading, drinking water dispensers, etc. The *Integrated Climate Protection Concept of Altona* describes a concept of "neighbourhood service centres" or "neighbourhood hubs". The idea is grounded in the concept of walkable city. These hubs should serve the residents as easily reachable access points for various services and offers for sustainable living. The proximity of classic daily services (such as doctors, banks, post office, school, etc.) shall therefore be guaranteed. Additionally, hubs can also be conceived as highly accessible places that can take on various hybrid functions (repair, recycling, sharing, counselling, support, social uses) that allow for a sustainable lifestyle.[1]

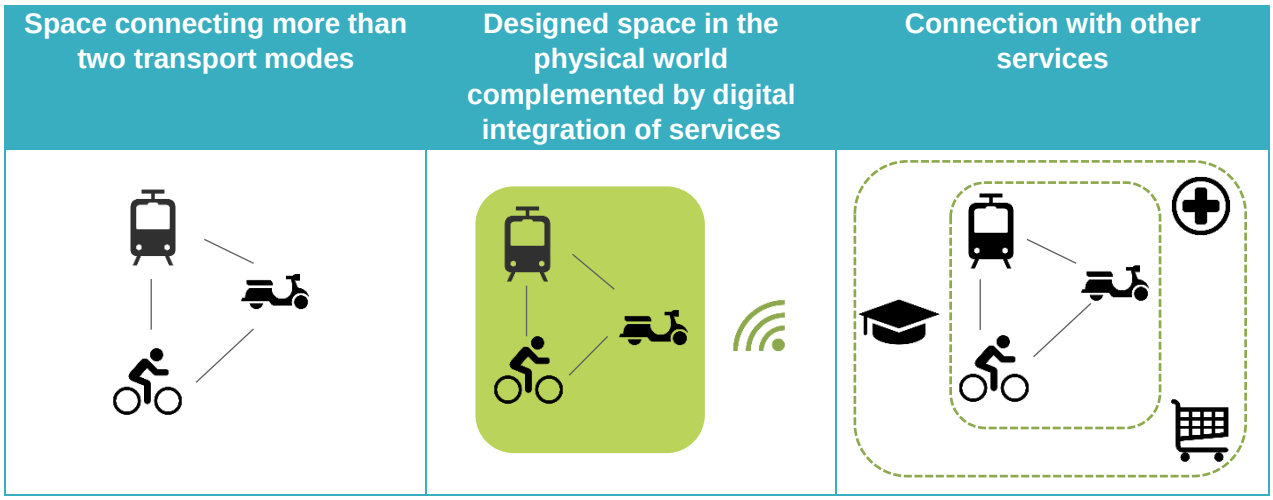

Figure 4: Multimodal hubs definitions among the community of practice

Comparing the existing definitions for multimodal hubs and their variety across European cities, which are sometimes not shared even within the same urban area, shows that this relatively new concept is still in its becoming. The exchanges around mobility hubs must consider these different starting positions and different understandings of what a hub is. Yet, the heterogeneity of the definitions shall also be seen as a richness on which the structured exchanges should build upon.

Beyond the question of the definition of hubs, cities face a number of challenges regarding their concrete use. Both Living Lab and replicator cities have expressed the issues they face in the framework of the needs assessment survey and the cities' session held in Hamburg in May 2022. Following a common objective to reduce the need of motorised transport and fostering the use of active modes, the Living Lab cities are working on a number of solutions.

In the context of space scarcity, the location of hubs is a common challenge faced by cities. This emphasises the need to explore multiple uses of a single space and the integration of various activities at different times of the day and night. Facing this challenge, the City of Oslo explores how to integrate such mobility hubs in strategic location such as shopping malls and Hamburg is looking into underused or empty spaces and buildings.

[1] The work of WP3: The urban social layer, focuses in-depth on some of these of aspects.

More, finding an adequate location that is relevant for the overall mobility system and which allows for a connection between the movement of people and the socio-economic activities in the neighbourhoods requires evidence of different quality and type.[2] Collecting the right data and processing it is thus a common challenge in this context. The necessary integration of different information systems that need to interact and the methodologies and technologies that should be used for such endeavour are also subject to questions and requires further learning (see also deliverable D6.2, p. 24).

Multimodal hubs for people and goods require cooperation of different types of stakeholders which are not used to cooperate. For the local authorities, this implies some challenges in setting up new forms of cooperation and partnerships between the more traditional public transport operators, the newer mobility services providers, and logistics operators.[3] On top of it, the collaboration does not only need to be planned and run during the implementation phase, but local authorities (and the wider ecosystem) also need to develop adequate business models to guarantee the medium and longer-term functioning of those hubs. Again, this is perceived by the local authorities as an ongoing challenge.

3.2.2 Capacity building interests on multimodal hubs for people and goods

The challenges faced by the cities in the deployment of multimodal hubs for people and goods are logically reflected in their thematic interests and thus their capacity building and replication needs. The most prominent topics for exchange and capacity building are related to business models and procurement and assessing the impact of the mobility hubs on the overall transport system.

Table 2: Capacity building needs on multimodal hubs for people and goods

Multimodal hubs for people and goods			
Topic of interests	**Popularity**	**Cities**	**Potential activities**
Definition of clear objectives for developing hubs or a network of hubs	☑ ☑	Oslo, Rome	Knowledge exchange
Service design	☑	Oslo	
Cooperation structures and partnerships	☑ ☑ ☑	Oslo, Gothenburg, Hamburg	Technical webinar
Cooperation with housing companies and developers	☑	Oslo, Hamburg	Knowledge exchange

[2] Work done in WP3 and WP5 (particularly Task 5.3) feed the knowledge exchange and capacity building programme on these aspects.
[3] WP6 specifically addresses this as part of the LL methodology: developing a governance for the LL and ICCP, bringing together Quadruple Helix partners, and looking at sustaining this partnership beyond the lifetime of the project.

Citizen participation	☑ ☑	Oslo, Munich	Knowledge exchange
Assessing the impact on the overall transport system	☑ ☑ ☑ ☑	Oslo, Munich, Bologna, Hamburg	Training session
Charging infrastructure in hubs	☑ ☑	Bologna, Rome	Technical webinar
Social impact of hubs	☑ ☑	Bologna, Hamburg	Knowledge exchange
Hubs integrating passenger transport and last-mile delivery solutions	☑ ☑ ☑ ☑ ☑	Oslo, Munich, Rome, Gothenburg, Hamburg	Technical webinar
Collaboration with private property owners for mobility hubs on private property	☑	Munich	
Location selection in a context of space scarcity	☑ ☑ ☑	Munich, Rome, Hamburg	Knowledge exchange
Business models	☑ ☑ ☑ ☑ ☑	Oslo, Bologna, Rome, Gothenburg, Hamburg	Knowledge exchange

3.2.3 Preliminary replication interests on multimodal hubs for people and goods per city

All cities have strong expectations on innovation replication related to multimodal hubs for people and goods. Some preliminary interests are summarised below. Yet, the further breakdown into precise innovations is expected to happen in the coming year. Living lab cities need to finetune their implemented measures and policies. This will allow all cities to further develop concrete replication action plans (deliverables D7.2 and D7.3).

Table 3: Preliminary replication interests on multimodal hubs for people and goods

City	Preliminary replication interests	Related measures from MOVE21 cities
Oslo	Mobility hub network development	Hamburg: Multi-functional hubs Gothenburg: Zero-emission micro-mobility hub for service providers

Hamburg	Integrated mobility and logistics hubs, such as parcel lockers in P+R facilities or public transport stations Neighbourhood freight consolidation centre with last-mile emission-free delivery	Oslo: Mobility hubs network Gothenburg: Zero-emission micro-mobility hub for service providers
Gothenburg	Developing multimodal hubs is among Gothenburg's core interests within MOVE21.	Oslo: Mobility hubs network Hamburg: Multi-functional hubs
Munich	By 2026, Munich has the objective to develop 200 so-called "mobility points" throughout the city. At the mobility points, car-sharing, rental bikes, or electric scooters services will be available in bundles to complement trips by public transport. The combination between the mobility hubs and associated logistics services is our core interest for future planning and for the replication within MOVE21.	Oslo: Mobility hubs network Hamburg: Multi-functional hubs
Bologna	Develop a mobility hubs network, integrate some measures for logistics. Develop a hub where train, bus, bike (and related services) services are well integrated, having a dedicated area for e-bike charging stations. The intention is also to equip this area with smart lockers for the distribution of parcels. Potentially develop micro-mobility hubs (depends on partnership with other local authorities) Mobility on demand for people and goods, combining public transport and freight	Oslo: Mobility hubs network Hamburg: Multi-functional hubs Gothenburg: Bicycle hub service pilot Oslo: On-demand mobility for people and freight Hamburg combines transport of passenger and freight
Rome	Develop micro-mobility hubs for service logistics Improve connections between the hubs	Gothenburg: Zero-emission micro-mobility hub for service providers Hamburg on inter-hub traffic

3.3 Urban logistics planning and regulation

The second most prominent theme for capacity building and replication is urban logistics planning and regulation. Topics related to this theme range from the local sustainable logistics planning (SULPs) and their action plans (including measures like consolidation centres, last-mile logistics, etc.) to regulations such as low- and zero-emission zones, to considerations relative to TEN-T integration.

3.3.1 Baseline and challenges relatively to sustainable urban logistics planning and regulation

The replication and capacity building needs being dependent on the existing experience of the cities involved in the community of practice, this chapter starts with some necessary baseline information.

When looking at the planning context among the living lab and replicator cities, only Hamburg and Bologna have a finalised SULP at metropolitan level. All other cities are currently in the process of developing SULPs or planning for a SULP in the near future. This implies that, for the cities currently drafting their SULPs, the learning needs might still be unclear or shift depending on the final targets and action plans that will be defined in their SULPs. Nonetheless, the analysis of the SULP status in the community of practice shows that, overall, all cities are taking a pro-active role in the definition of their local logistics policies.

Table 4: SULP status in MOVE 21 cities

City	SULP status
Oslo	Has a pre-project for a SULP (FSULP) finalised in 2022
Gothenburg	Has started to work on a SULP in 2021
Hamburg	Yes, Hamburg has adopted a SULP
Munich	Munich does not have a SULP, but is currently developing one as part of the Mobility Strategy 2035 and its sub-strategy Commercial Traffic
Bologna	Yes, Bologna has adopted a SULP
Rome	SULP in progress (for Rome and its metropolitan area)

For some of the cities surveyed for needs assessment purposes, the SULP planning process has revealed a lack of awareness relatively to the emissions generated by urban logistics.

Table 5: Ranking of awareness about emissions generated by urban logistics

City	Ranking *scale from 1 (low) to 5 (high)*
Oslo	5
Gothenburg	4
Hamburg	5
Munich	2
Bologna	1
Rome	2

From the ranking of awareness levels regarding emissions generated by urban logistics one can distinguish big gaps between the cities. While Oslo, Gothenburg, and Hamburg perceive their awareness as high, the replicator cities rank their awareness much lower. Logistics data collection being an important challenge all cities would like to tackle and work on, a potential transfer of knowledge between the living lab and the replicator cities is clearly identified.

Furthermore, when we look at the awareness relatively to urban logistics flows, again we distinguish disparities between the cities and identify different levels of data gathering.

Table 6: Ranking of awareness about logistics flows

City	Ranking *scale from 1 (low) to 5 (high)*
Oslo	4
Gothenburg	3
Hamburg	4
Munich	2
Bologna	1
Rome	2

The awareness ranking relatively to urban logistics flows across the living lab and replicator cities shows that there is a great heterogeneity between the cities. Most of the cities describe a poor awareness of urban logistics flows, only Oslo and Hamburg are quite confident in the awareness of the flows entering or crossing the city. Thus, there is a clear potential to exchange within the community of practice on this topic.

3.3.1.1 Types of data on logistics flows

While the cities have different perceptions of their data awareness, they also prove to be having different data collection methods. One source of information for cities is the number of vehicles registered, which for instance in Hamburg is available yearly.

> *"Generally, there is not very much quantitative data available regarding urban logistics. It is possible to access data about how many trucks are registered in Hamburg. In the studies mentioned before, quite a few expert interviews and workshops with last-mile actors have been conducted which resulted in a good basis of qualitative data regarding the last-mile." (Hamburg's response to the MOVE21 Capacity Building and Replication Needs Assessment Survey)*

Some of the cities use their tolling system to measure the logistics flows. This is the case in Oslo, where a monitoring of the vehicles driving through the toll ring is performed monthly and finally presented as part of the Climate barometer.[4] At the city level in Bologna, the Municipality of Bologna periodically collects data on the access of freight vehicles in the inner city thanks to the video surveillance system of the vehicles accessing the Low-Traffic Zone (LTZ). Yet, for the peri-urban and suburban areas, no arrangements are made to monitor the logistic flows. Bologna complemented this with a significant campaign to collect data and information on logistics flows in 2018 for the purpose of SULP development. In Rome, flow data on freight vehicles are collected using the automatic flow measuring stations operated by RSM and also using the probe vehicle fleet. This is basic data with a breakdown of less than one hour, which is then aggregated at longer intervals. In Gothenburg, the analysis is based on data from several sources: congestion portals and cameras ("*trängselportaler*"), different

[4] https://www.klimaoslo.no/klimabarometeret/veitrafikk/passeringer-i-bomringen/.

measurements – both manually performed (occasionally) and through reoccurring technical measurements, transport administration databases, and data from heavy transport businesses in the city. Hamburg is currently experimenting innovative ways of collecting data. Through the Smart Delivery and Loading Zones project in Hamburg or the Hamburg Box, the city gets access to the data from delivery companies. Overall, cities are using multiple data sources available, yet lack more fine-grained or dynamic data on actual flows, which represents a challenge when developing urban logistics policies.

3.3.1.2 Baseline and challenges on low-emission zones (LEZ) and zero-emission zones (ZEZ)

All cities involved in the community of practice with the exception of Hamburg and Munich (which has implemented a LEZ since 2008) consider the implementation of LEZs and ZEZs in the near future. While Rome and Bologna are considering both, Oslo will focus on ZEZ, and Gothenburg on LEZ.

The main challenges faced by the cities lay in the regulatory frameworks they need to put in place. The acceptability of ZEZs and LEZs is a significant challenge the cities need to tackle. To develop the right compensation or agreements with the stakeholders affected by the ZEZs and LEZs, cities lack information on the impact of LEZs and ZEZs on different stakeholder types such as residents, local shops, or logistics operators. LEZ and ZEZ impact assessments is thus a core aspect that the cities would benefit to discuss in the framework of the capacity building activities.

Table 7 Status concerning LEZs and ZEZs in MOVE21 cities

City	Current situation	Future plans
Oslo	No LEZ/ZEZ Limited traffic zones and pedestrian zones in downtown Oslo	ZEZ
Munich	LEZ, but no ZEZ Limited traffic zones and pedestrian zones in downtown Munich	A car-reduced old town area is planned
Bologna	Both LEZ and ZEZ	LEZ, ZEZ
Rome	LEZ, but no ZEZ	LEZ, ZEZ
Gothenburg	LEZ, but no ZEZ	The city is interested in implementing more regulation. The only decision at the moment is to conduct a study on the low-emission zone (*miljözon 3*) before 2025 (specified in the Energy Plan, joint assignment for the Environment & Climate Department and the Traffic Department).
Hamburg	No, but restrictions on older diesel-fuelled vehicles	No such plans for the near future

3.3.2 Detailed capacity building interests in urban logistics planning and regulation

The main challenges faced by the cities in terms of logistics planning are reflected in their willingness to primarily build capacity on logistics data collection as a precondition to develop solid logistics strategies and adapted measures. In terms of planning, cities are thus also most interested in strategic aspects (e.g. objective setting, vision) in relation to SULP development.

This interest is closely followed by the necessity to build capacity in relation to the development of specific measures such as combined mobility and logistics hubs, including last-mile solutions and consolidation centres at neighbourhood level. Low- and zero-emission zones are at the core of the regulatory measures the cities want to tackle within MOVE21. Here, the capacity building shall concentrate on the regulatory aspects and the impact measurement.

Table 8: Capacity building interests on sustainable urban logistics planning and regulation

Sustainable urban logistics planning and regulation			
Topic of interests	**Popularity**	**Cities**	**Potential activities**
LOGISTICS PLANNING			
Improving logistics in suburban areas	☑	Bologna	
SULP development: strategic aspects (e.g. objective setting, vision)	☑ ☑ ☑	Oslo, Rome, Gothenburg	Knowledge exchange
SULP development: definition of a coherent set of measures	☑	Munich	
Logistics data collection	☑ ☑ ☑ ☑ ☑ ☑	Oslo, Munich, Rome, Gothenburg, Hamburg, Bologna	Technical webinar
Using urban waterways for logistics	☑	Oslo	
Inter-hub traffic	☑ ☑	Oslo, Hamburg	Technical webinar
Integration of logistics with	☑ ☑	Oslo, Hamburg	Technical webinar

passenger transport solutions			
Consolidation centres at neighbourhood level	☑ ☑ ☑	Munich, Bologna, Gothenburg	Knowledge exchange
Temporary logistics hubs	☑	Oslo	
LEZ/ZEZ			
Regulatory aspects	☑ ☑ ☑ ☑ ☑	Oslo, Munich, Rome, Gothenburg, Hamburg	Knowledge exchange
Stakeholders to engage	☑ ☑ ☑	Oslo, Rome, Hamburg	Knowledge exchange
Compensating measures to put in place	☑ ☑ ☑	Oslo, Bologna, Gothenburg	Knowledge exchange
Logistics and deliveries for car-free zones	☑ ☑ ☑ ☑	Oslo, Munich, Rome, Hamburg	Knowledge exchange
Aspects having to do with inclusiveness (e.g. risk of gentrification)	☑ ☑ ☑ ☑	Oslo, Munich, Bologna, Hamburg	Knowledge exchange
Expected impacts on businesses, logistics services, residents and how to ensure their buy-in	☑ ☑ ☑ ☑ ☑	Munich, Bologna, Rome, Gothenburg, Hamburg	Knowledge exchange
How to measure the impact on air quality	☑ ☑ ☑	Bologna, Rome, Hamburg	Technical webinar
Impact assessment in general	☑ ☑	Bologna, Gothenburg	Training session
Location determination	☑	Hamburg	

3.3.3 Preliminary replication interests concerning sustainable urban logistics planning and regulation

Table 9: Preliminary replication interests on sustainable urban logistics planning and regulation

City	Preliminary replication interests	Related measures from MOVE21 cities
Oslo	In the context of following up its pre-project on a SULP (FSULP), Oslo is looking into replicating logistics data collection strategies and methods to develop the measures to reduce the traffic. For the development of the ZEZ in the city centre, Oslo is particularly interested in all experiences with regulating a ZEZ zone.	Bologna: the city has a longstanding experience with ZEZ
Hamburg	No concrete replication need expressed	
Gothenburg	No concrete replication need expressed	
Munich	In light of the development of a SULP, some replication could be envisioned to support this process.	Hamburg and Bologna have adopted a SULP; in Gothenburg, and Rome the SULP development is in progress
Bologna	Potentially see how to expand the access regulation beyond the city centre	
Rome	Freight and zero-emission zone regulation	Oslo: seamless freight in and out of ZEZ

3.4 Mobility-as-a-Service (MaaS)

Mobility-as-a-Service is the third main theme the cities expressed interest to exchange and to work on in MOVE21 for their capacity building and replication activities.

3.4.1 Baseline and challenges regarding MaaS

It is notable that as a baseline intention, all cities indicated their intention to implement a MaaS system in the near future. Yet, this implementation comes with a number of challenges the cities face and which are further detailed below.

Developing a MaaS system implies to know how to integrate different data sets form different service providers and to create the conditions for this data sharing to happen. Overall, the perception in terms of capacity of the local authorities to establish partnerships which allow data sharing between mobility operators and the local authorities is rather high. Mainly Bologna indicated to have little capacity in that regard. This shows that the cities in the MOVE21 project do have a necessary precondition and experience to be able to develop such MaaS systems. As it seems, the discrepancies between the involved cities can be tackled and become subject to knowledge exchange and capacity building activities.

Table 10: Perceived capacity to share data between mobility operators and the public administration in the context of a MaaS system

City	Ranking *from 1 (low) to 5 (high)*
Oslo	4
Munich	4
Bologna	1
Rome	4
Gothenburg	3
Hamburg	No information

The results of the needs assessment survey also showed that there are different levels of service integration operating in the cities already. Some of the urban areas have developed some apps which allow citizens to plan their trips, yet those apps do not include all the mobility services currently operating but mainly the public transport and the P+R services. In Gothenburg, the local public parking company makes it possible to purchase public transport ticket through the parking app.[5] In Bologna, for instance, there is no service that can be properly considered MaaS. Yet, at the level of the Emilia-Romagna region, the Roger app which is also active in the metropolitan area of Bologna allows users to organize their trip through:

- Personalized travel planner: calculate the best route for you
- One-click purchase of bus and train tickets
- Information on the closest stops and timetables in real time
- Parking payment
- Real-time info on bus crowding.

Similarly, in Munich, there are two apps for public transport (MVG Fahrinfo and MVV-App). These do not currently integrate shared mobility services. However, MVG has developed the MVGo app, an app that can be used to rent bikes from the city's bike rental system MVG Rad, as well as e-scooters from Voi and TIER, and e-mopeds from TIER. In addition, there are some private providers such as Sixt share, Uber, or FREE NOW that offer various mobility services such as car sharing, ridesharing, or e-scooters for booking in their apps. In Hamburg, hvv switch allows to book and buy both trips with the public transport as well as some micro-mobility or car-sharing options. In the case of Gothenburg, there is a local-national integration since 1993 for public transport through a service that allows to buy a train ticket and add the local public transport within the same purchase and ticket.[6]

None of these can be considered as fully integrated MaaS systems, as the trips between the more traditional public transport and the shared mobility modes remain to be booked and paid separately. The right cooperation structure between the local authorities and the various mobility operators and the business model behind those integrations remain a major challenge for MOVE21 cities.

[5] https://www.parkeringgoteborg.se/nyheter/betala-biljett-pa-vasttrafik-i-appen-parkering-goteborg/.
[6] https://samtrafiken.se/tjanster/resplus/.

3.4.2 Detailed capacity building interests concerning MaaS

When it comes to MaaS, the core of what cities want to share and learn about has to do with how to improve or create conditions for MaaS integration and what this entails in terms of governance structures. This amounts mainly to how to put in place collaborations and partnerships with the private operators in a fragmented mobility landscape.

Table 11: Capacity building interests on MaaS

MaaS			
Topic of interests	**Popularity**	**Cities**	**Potential activities**
How to design a Maas ecosystem	☑	Munich	Online course
Business models for MaaS	☑ ☑ ☑ ☑	Gothenburg, Rome, Bologna, Oslo	Technical webinar
How to make digital solutions inclusive	☑ ☑ ☑	Hamburg, Gothenburg, Oslo	Knowledge exchange
Cooperation structures for a MaaS system	☑ ☑ ☑ ☑	Hamburg, Rome, Munich, Oslo	Knowledge exchange
Which data to gather and how	☑	Hamburg	
Integration of innovative services with more traditional ones	☑ ☑ ☑	Hamburg, Gothenburg, Bologna	Knowledge exchange
Data sharing between various service providers	☑ ☑ ☑	Hamburg, Rome, Oslo	Knowledge exchange
MaaS for peri-urban and suburban areas	☑	Bologna	
Developing a MaaS strategy	☑	Munich	

3.4.3 Preliminary replication interests concerning MaaS

Table 12: Preliminary replication interests on MaaS

City	Preliminary replication interests	Related measures from MOVE21 cities
Oslo	MaaS, mobility platform development	Munich: Developing a MaaS strategy and a mobility platform at Bavaria level (including cities such as Nuremberg, Augsburg)

Hamburg	No specific replication need mentioned on MaaS	
Gothenburg	MaaS integration and platform development	Munich: Developing a MaaS strategy and a mobility platform at Bavaria level (including cities such as Nuremberg, Augsburg)
Munich	Developing a MaaS strategy and a mobility platform	Interest in exchanging with Oslo and Gothenburg
Bologna	No specific replication need mentioned on MaaS	
Rome	MaaS concept development	Munich: Developing a MaaS strategy and a mobility platform at Bavaria level (including cities such as Nuremberg, Augsburg)

3.5 Transversal themes

3.5.1 Incentivisation and nudging

Behavioural approaches such as incentivisation and nudging appear to be transversal topics to be tackled in all discussions related to the main three vertical topics described previously. Behavioural change has a physical dimension (e.g. infrastructure, mobility hubs), a digital dimension (e.g. digital platforms, MaaS systems), as well as a human dimension (e.g. psychological triggers).

3.5.1.1 Baseline and challenges in terms of incentivisation and nudging

The survey results show that cities have already some experience in developing nudging and incentives for commuters to favour the modal shift towards a greater use of public transport and active modes. In Munich, the New Citizens Package is the core nudging strategy directed towards the citizens. Oslo regularly runs campaigns besides subsidy schemes for establishing bike parking and removing parking lots for cars. At the national level in Italy, a recent measure has introduced the possibility for employers to subscribe to an agreement with the public administration in order to provide employees with a loan linked to the number of kilometres travelled by bicycle.

Gothenburg is currently exploring seasonal nudging through time-limited projects where participants can borrow an electric bicycle, as well as projects where users can get free winter gear to enhance bicycle use during winter. Also, the public transport company offers car commuters to apply for time-limited tickets to try public transport commuting.

Yet, little or less experience is available throughout the group on incentives embedded into travel planners or MaaS systems or on incentives targeted at logistics providers. The main existing programmes relate to the electrification of van fleets (the München eMOBIL program supports for instance the purchase of electric vehicles), charging infrastructure, and consulting services in the field of electromobility. Oslo also has subsidy schemes directed to logistics providers for installing EV charges or for investment in EV vans/trucks.

3.5.1.2 Capacity building interests on incentivisation and nudging

The capacity building interests are quite split in the group compared to the other themes. This might be related to the fact that the nudging is very much context specific. Gothenburg for instance has expressed greater seasonal nudging needs which not reflected in the other cities' responses. Overall, the cities share a common interest in learning about new behavioural methods that reach beyond the ones they have already in place. Some pairs do have targeted interested in specific actors such as Hamburg and Rome for logistics operators, or Munich and Bologna for MaaS use.

Table 13 Status of existing incentives / rewarding schemes in MOVE21 cities

City	Do you have incentives for employers to favour the sustainable commute of their employees?	Do you have incentives / rewarding schemes for commuters to use public transport, cycling, or other sustainable transport modes?	Do you have incentives for MaaS service providers?	Do you have incentives for urban logistics providers to switch to more sustainable trucks/vans?	Do you have incentives for building sites to sustainably manage waste and other logistics need?
Oslo	Yes	Yes	Yes	Yes	No
Munich	Yes	Yes	No	Yes	Yes
Bologna	Yes	Yes	No	No	No
Rome	Yes	No	No	No	No
Gothenburg	Yes	Yes	No	Yes	Yes
Hamburg	No	Yes	No	No	Partially

Table 14: Capacity building interests on incentivisation and nudging

Incentivisation and nudging			
Topic of interests	**Popularity**	**Cities**	**Potential activities**
Definition of the target groups to nudge	☑ ☑ ☑	Gothenburg, Rome, Oslo	Knowledge exchange
Business model to sustain incentivisation and nudging in medium/long term	☑	Bologna	
Methods to trigger behavioural change	☑ ☑ ☑ ☑	Oslo, Munich, Gothenburg, Hamburg	Training session

Incentives/nudging for increasing the use of active modes	☑ ☑	Oslo, Hamburg	Knowledge exchange
Rewarding schemes embedded in the ticketing system	☑ ☑ ☑	Bologna	Technical webinar
Triggers to increase the use of MaaS	☑ ☑	Munich, Bologna	Knowledge exchange
Citizen science methods	☑	Hamburg	
Incentives to integrate passenger and freight transport	☑ ☑	Hamburg, Rome	Technical webinar
Seasonal nudging (e.g. summer/winter active mobility)	☑	Gothenburg	
Choice design to trigger behavioural change	☑	Rome	

3.5.1.3 Preliminary replication interests on incentivisation and nudging

Table 15: Preliminary replication interests on incentivisation and nudging

City	Preliminary replication interests	Related measures from MOVE21 cities
Oslo	We are interested in all kinds of activities to incentivise and nudge the citizens and operators in the city to change to sustainable transport modes and to reduce the use of cars	N/A
Hamburg	No concrete replication need expressed	
Gothenburg	No concrete replication need expressed	
Munich	No concrete replication need expressed	
Bologna	High interest in developing rewarding schemes, as well as in developing an interactive tool / digital platform to manage those rewarding schemes	N/A
Rome	Rewarding schemes and incentives for freight operators	N/A

3.5.2 TEN-T integration

TEN-T integration, that is how to integrate the urban mobility and logistics measures in a wider TEN-T context and how to bring the TEN-T dimension into urban mobility and logistics planning, constitute the second transversal theme MOVE21 cities are interested to exchange and to build capacity on. This theme is strategic at the project level and it connects with a number of tasks dedicated to dissemination

and wider uptake, namely TEN-T Urban Nodes Forum (Task 10.3) and the Scan-Med Observatory (Task 10.4), and it is reflected in the overall evaluation approach (see Task 8.4).

3.5.2.1 Baseline and challenges in terms of TEN-T integration

While D4.1, D6.2, D6.3, and D6.4 have provided some insights concerning governance aspects in relation with each of the living labs cities, the needs assessment provided further indications on the level of TEN-T integration for each of the six cities. The following baseline information were thus gathered:

- All the cities involved have some sort of governance structure for the functional urban area (FUA), but differently structured
- All the cities have defined their FUA for passenger transport
- Only Rome and Bologna have defined their FUA for logistics
- Only Oslo and Gothenburg monitor the impacts of the changes at TEN-T level on the local transport system.

The responses provided by the cities show that there is already some capacity regarding the TEN-T integration for passenger transport, all of the cities have defined their FUA for passenger transport and two of them already measure how their local transport system is impacted by the changes at the wider transport network level. Yet, the exchange with the cities also highlighted that there is still room for improvement in the coordination and governance and the interactions between the different territorial scales to ensure the planning of a robust and sustainable urban passenger transport system.

At the core of the TEN-T integration challenges on logistics specifically, we can notice a lack of awareness in regards to the FUA. Most of the cities lack a clear understanding of the FUA for logistics to map the scope of logistics activities in the inner city and its functional area. This has most probably repercussions on the governance structure or cooperation that can be put in place to manage a coordinated vertical integration strategy.

While the integration between the passenger and respectively the freight transport systems seem to start to be handled through some measures such as joint hubs, there are still major challenges to integrate those into strategies at the wider level in the vertical integration efforts.

3.5.2.2 Capacity building interests in terms of TEN-T integration

The capacity building needs reflect the challenges mentioned above and thus focus on the definition of the respective FUAs for both passenger transport and logistics, and more generally on the governance aspects to consider.

Table 16: Capacity building interests on TEN-T integration

TEN-T integration			
Topic of interests	**Popularity**	**Cities**	**Potential activities**
Definition of your logistics FUA	☑ ☑	Oslo, Rome	Knowledge exchange

Definition of your mobility FUA	☑ ☑	Oslo, Rome	Knowledge exchange
Governance aspects in relation with planning and implementation at the FUA level	☑ ☑ ☑ ☑	Oslo, Bologna, Hamburg	Knowledge exchange
Vertical integration and policy coherence[7]	☑	Hamburg	
Integration of TEN-T aspects in local urban mobility and urban logistics planning	☑ ☑ ☑ ☑	Munich, Bologna, Rome, Hamburg	Technical webinar

3.5.2.3 Preliminary replication interests on TEN-T integration

For the moment, only the city of Hamburg has identified a clear interest in developing a measure related to the TEN-T integration, namely developing integrated cycling strategies at the Ten-T level. This situation might develop in the coming years through exchanges and technical input, which could potentially emerge into replication needs not yet identified.

[7] Task 6.2 in WP6 covers this topic and feeds knowledge exchange and capacity building activities.

4 Mapping future capacity building and replication activities

4.1 Knowledge exchange and capacity building activities

Knowledge exchange and capacity building can be delivered in a number of formats and MOVE21 makes use of a significant number of such methods: an ongoing online exchange hub, regular knowledge exchange webinars, occasional in-person cities' sessions, technical webinars, in-person training sessions, dedicated online courses, as well as on-site study visits and peer-learning visits.

As discussed previously, all the planned activities can be clustered either as knowledge exchange activities or as capacity building or as replication activities. The replication activities will be discussed in the next section. Here, we detail the knowledge exchange and capacity building activities. The rule of thumb is that if a topic is rather suitable for peer learning, then a method for knowledge exchange should be used, be it a webinar or an in-person cities' session. If, on the contrary, a topic requires expert knowledge and specific experience, then a capacity building method will work best: be it a technical webinar, an in-person training session, or a more coherent online course.

Given the various constraints and commitments within the project and the experience until now, all activities within the community of practice were mapped in Figure 4 below. Resources to support these activities are identified on an ongoing basis during the lifetime of the project. In some cases, there are concrete topics that were identified as useful and meaningful and even the right expertise to support these activities was identified. In some other cases, things are still flexible and tentative and internal or external expertise or synergies with other projects and activities will be identified at a later stage. As the figure shows, some of the activities are coordinated among them, for example a study visit and a consortium meeting might offer the right opportunity for a cities' session or a training session. In some other cases, knowledge exchange and capacity building are coordinated with outreach and dissemination activities, for example the Urban Node Forum meetings (Task 10.3).

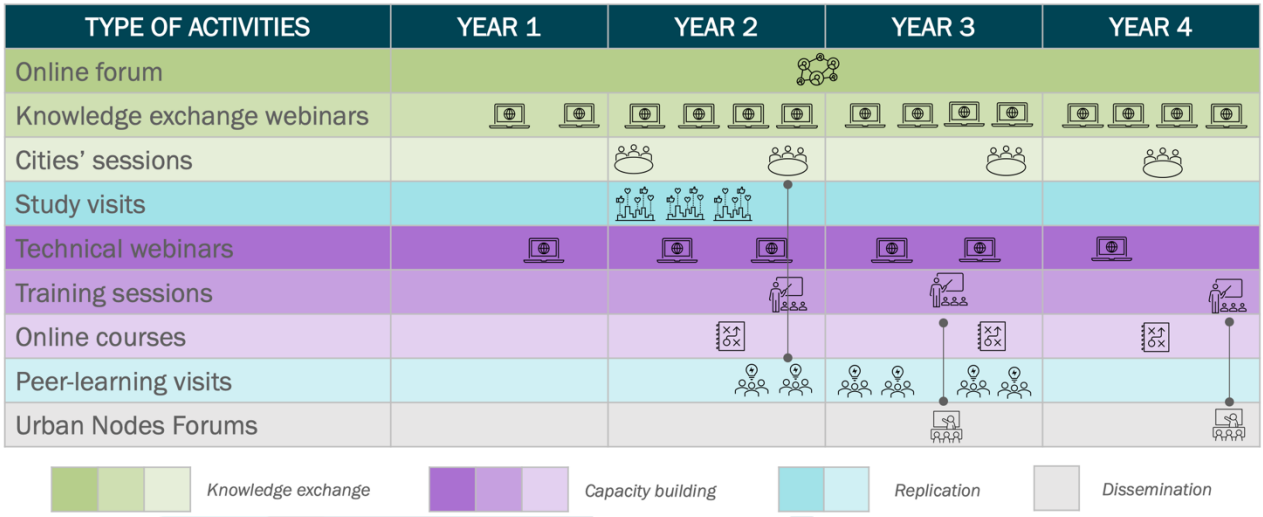

Figure 5: Planning of knowledge exchange and capacity building activities

As expected, year 1 was not so rich in knowledge exchange and capacity building meetings as the focus at project level was mostly on the establishment of the living labs in Oslo, Gothenburg, and Hamburg. Year 2 and 3 are naturally the busiest, also due to the fact that the initial study visits were

pushed from year 1 to year 2 due to the COVID-19 pandemic. In the last year of the project, again naturally, the focus shifts towards transferability and dissemination and there will be less resources for internal exchange and capacity building.

The list of topics for knowledge exchange (both webinars and in-person cities' sessions) is virtually very long, so no complete mapping is intended. Tables 2, 8, 11, 14, and 16 map many such topics for exchange. Still, a number of topics came out from interactions with various partners that did not come up in the needs assessment survey. These include:

- Visioning for upscaling tested innovations to strategies (a knowledge exchange webinar took place in April 2022; lead by RISE, as WP4 leader)
- The role of municipalities in innovation projects (a knowledge exchange webinar took place in June 2022; lead by RISE, as WP4 leader)
- Managing co-creation processes and creating co-creation partnerships (addresses in WP6, led by TNO)
- Policy coherence and integration to support mobility innovation (addressed in WP6, led by TNO).

For the technical webinars, again some flexibility needs to be kept in order to make use of synergies and opportunities for collaboration with other projects and initiatives or external experts. One technical webinar was organised in February 2022 on the topic:

- Multimodal mobility hubs and last-mile delivery.

Potential topics for future meetings identified include:

- Cooperation structures and partnerships for multimodal hubs
- Integration of logistics with passenger transport solutions
- Logistics data collection
- Incentives and rewarding schemes embedded in the ticketing system
- Business models for multimodal hubs / MaaS
- Integration of TEN-T aspects in local urban mobility and urban logistics planning.

The needs assessment survey and ensuing interactions identified some specific needs for training sessions and these include:

- Assessing the impact of multimodal hubs on the overall transport system
- Methods to trigger mobility behaviour change
- Incorporating data-driven approaches in mobility planning.

Potential partnerships for the adequate hosting of the online courses are currently investigated. The planned online courses are tentatively dedicated to:

- Multimodal hubs in an urban transport system
- Demand management for logistics and deliveries
- Designing a MaaS ecosystem.

4.2 Replication activities timeline

The replication activities have a planning and implementation component. And, as detailed in chapter 2, on-site study visits (in the three living lab cities) and peer-learning visits (in all six cities) support the replication activities. The study visits are organised in each of the Living Lab cities at the beginning of

the project with the aim of kickstarting knowledge exchange. The study visit in Hamburg took place in May 2022. The study visits in Oslo and Gothenburg are planned for September 2022.

Besides this, each of the six MOVE21 cities will host one peer-learning visit with the purpose of learning from each other, get tailored feedback, and monitor the progress towards replication. The peer-learning visits are tentatively planned as such (still to be validated with all parties concerned):

- April 2023: peer-learning visits in Bologna and Rome
- October 2023: peer-learning visits in Munich and Hamburg
- April 2024: peer-learning visits in Gothenburg and Oslo.

The present *Capacity Building and Replication Master Plan* provides the general framework for capacity building and replication activities. It outlines the replication approach and the extensive knowledge exchange and capacity building activities supporting replication. Following this, both replicator cities as well as living lab cities will engage in drafting their replication action plans. The plan details the city-specific plans for replication of selected measures. The cities will be supported all along this process with templates for the action plans and extensive knowledge exchange and capacity building to make it possible to select for replication of the innovations most suitable for their local contexts. The city-specific replication action plans need to be available by August 2023. Following that, the six cities will need to work on the implementation of the replicated innovation: replicator cities will each implement three such replicated innovations, while Living Lab cities will each implement one such replicated innovation, as detailed in sub-section 2.3.2. Figure 6 below offers a tentative timeline of replication activities.

Figure 6: Replication activities timeline

Cascade cities, at their turn, will draft action plans. These are city-specific plans to prepare transferability of selected measures. Cascade cities will participate in selected activities during the project. Extensive professional networks will be utilised to further illustrate and discuss MOVE21 innovative solutions and how they can be tailored to different local environments which will feed into their action plans. The cascade cities actions plans are due in August 2024. Cascade cities support the take-up of selected innovation, but the innovations detailed in their action plans are not expected to be implemented within the timeframe of MOVE21.

Conclusions

The main aim of the *Capacity Building and Replication Master Plan* is to provide the general framework for capacity building and replication activities, to serve as guidance and offer perspective to the six cities and all technical partners involved in the knowledge exchange and capacity building activities.

- The master plan outlines the replication approach and the extensive knowledge exchange and capacity building activities supporting replication.
- It maps and analyses the challenges, learning needs, and replication interests in the community of practice established within the project. It consolidates the identified capacity building and replication needs into three vertical themes: multimodal hubs for people and goods, sustainable urban logistics planning and regulation, and mobility-as-a-service (MaaS) and two transversal themes: incentivisation & nudging and TEN-T integration. This needs assessment offers a substantial basis for planning future knowledge exchange and capacity building activities and for supporting replication.
- Moreover, the master plan provides concrete indications about future knowledge exchange and capacity building activities as a way of supporting replication and a concrete timeline for replication activities.
- Once this master plan is available, the six MOVE21 cities enter into the planning phase of their replication activities. This phase will result in replication action plans that will be implemented at later stages during the project.
- At the same time, WP7 will continue the dialogue with the other WPs and all partners involved in order to align the different needs and to come from this overview of topics and activity types to concrete knowledge exchange and capacity building activities to support replication. Some of these activities will look beyond MOVE21 for joint events related to capacity building.

Replication of selected innovations co-created and tested within the MOVE21 living labs has this double role of validating the innovative solutions and assessing their transferability potential and, at the same time, support the wider take-up of these innovations. At the same time, the two-way replication approach adopted will allow for the replication of innovations developed outside the MOVE21 living labs, supported by extensive knowledge exchange between the urban nodes involved. The replication process considered in MOVE21 draws heavily on a peer learning and capacity building methodology. Peer-to-peer learning is a proven instrument for improving the implementation of cities' policies and strategies or their practices. More, the capacity building activities contribute to the overall sustainability of the project as the lessons learned and the processes entertained by the municipal administrations will stay well beyond after the lifetime of the project.

Annex A – Capacity building and replication needs assessment survey

This survey is part of the capacity building and replication needs assessment that takes place as preparation for the replication activities in WP7. Its aim is to identify the themes the urban nodes will focus on for replication and to assess the learning and exchange needs for facilitating this process.

Beside strictly collecting available data and information, surveys have the benefit of collecting subjective perceptions which capture otherwise unmeasurable characteristics of urban mobility policies. In order for MOVE21 partners to best use the responses in order to adapt the replication activities, we highly encourage respondents to engage the right expert colleagues on the topics addressed in order to generate the most informative and useful answers.

The results of the survey will thus help:

- to generate a clear understanding of the current situation in each of the six urban nodes;
- to identify the areas and, where possible, the specific measures each of the cities would like to replicate;
- to assess each city's learning needs in relation to the measures they would like to replicate;
- to identify good practices from all six cities in order to enable other cities to learn from that experience.

The questionnaire includes the following sections:

- A. Introduction: context
- B. Sustainable urban logistics planning
- C. Mobility hubs for people and goods
- D. Access regulations
- E. Mobility-as-a-service (MaaS)
- F. Incentivisation and nudging
- G. Role of urban nodes on the wider TEN-T network
- H. Prioritising the measures/policies to replicate

** Required questions.*

A. Introduction: context

The following section focuses on the context in which mobility planning is taking place and on data availability. The answers enable MOVE21 partners to get a general understanding of the current situation.

1. Which relevant strategic documents / policies did your city adopt within the last decade that are most relevant to MOVE21 and to the measures you plan to implement/replicate as part of the project?*

- Answer: ...

2. If available, please provide links to the documents and policies mentioned above and/or to relevant informative articles.

- Answer: ...

3. Which relevant strategic documents / policies are currently under development that are most relevant to MOVE21 and to the measures you plan to implement/replicate as part of the project?

- Answer: ...

4. If available, please provide links to the documents and policies mentioned above and/or to relevant informative articles.

- Answer: ...

5. Does your city have a Sustainable Urban Mobility Plan (SUMP) or are there plans to develop one in the near future?*

- There is an adopted SUMP and we are currently implementing it
- A SUMP was developed and it is in course of adoption
- We are in the process of developing a SUMP
- It is the city's intention to develop a SUMP in the future, but we have not started yet
- We don't have a SUMP and there are no current plans to develop one
- Other

6. Are you aware of the current modal split (proportion between trips undertaken by the different modes of transport) in your city?*

- Yes
- No

7. If yes, which is the most recent source of these data?

- Answer: ...

8. Do you have up to date public transportation use figures for the areas where MOVE21 measures are to be implemented?*

- Yes, for all test sites
- Yes, for some of the test sites
- No

9. I f you have the data for all or some test sites, please specify your source of information for each test site.

- Answer: ...

10. How would you generally describe the cooperation between mobility service providers and the local authorities?*

- The local authorities have an active cooperation with most service providers
- The local authorities have an active cooperation with a few service providers
- The local authorities cooperate occasionally with the service providers
- There is no cooperation with service providers
- Other

11. Specify the kind of cooperation with examples (types of partnership), if applicable.

- Answer: ...

12. How would you assess the municipal capacity to incorporate data-driven approaches in managing the local mobility system?*

- On a scale from 1 (low) to 5 (high)

B. Sustainable urban logistics planning

In the following section we will query about your current status and knowledge input in terms of sustainable urban logistics planning.

13. Does your city have a Sustainable Urban Logistic Plan (SULP) or similar?*

- Yes
- No

14. If no, please specify how does your city integrate the logistics dimension into the existing mobility strategies.

- Answer: ...

15. If yes, provide the link to it and/or to relevant informative articles.

- Answer: ...

16. If yes, please specify which aspects are of interest to you.

- Answer: ...

17. Rank your awareness about current logistics flows (in terms of data availability) in your city.*

- On a scale from 1 (low) to 5 (high)

18. Which source(s) of information do you have for data about logistics flows? Please specify if you have daily, weekly, monthly, or yearly figures.

- Answer: ...

19. Rank your awareness of the number of light vans crossing the city.*

- On a scale from 1 (low) to 5 (high)

20. Which source(s) of information do you have for data about light vans traffic? Please specify if you have daily, weekly, monthly, or yearly figures.

- Answer: ...

21. Rank your awareness about the emissions generated by urban logistics in the city.*

- On a scale from 1 (low) to 5 (high)

22. Which source(s) of information do you have for data about emissions generated by urban logistics? Please specify if you have daily, weekly, monthly, or yearly figures.

- Answer: ...

23. Would you like to learn more about Sustainable Urban Logistics Planning (SULPs)?

- Yes
- No

24. Which aspects are you most interested in?* *(Select a maximum of 3 options.)*

- SULP development: strategic aspects (e.g., objective setting, vision)
- SULP development: definition of a coherent set of measures
- SULP development: stakeholder engagement

- Logistics data collection
- Combined mobility and logistics hubs, including last-mile solutions
- Integration of logistics with passenger transport solutions
- Consolidation centres at neighbourhood level
- Cargo-bike schemes
- Smart parcel boxes
- Retrofitting underused infrastructures (e.g., touristic bus stalls) for logistic purposes
- Temporary logistic hubs
- Using urban waterways for logistics
- Other

25. Indicate best practices in terms of sustainable urban logistics from your city you would like to share with your peers, if any.

- Answer: ...

C. Mobility hubs for people and goods
In the following section we will query about your current status and knowledge input in terms of mobility hubs for people and goods.

26. How do you define mobility hubs in your city?* *(Think at the ones in place or at the ones you plan to implement in MOVE21.)*

- Answer: ...

27. Describe the types of hubs you have in place, distinguishing the modes and the different services connected, as well as the scale of the hubs.
Some potential examples include:

a) *Integrated mobility and logistics hubs, such as parcel lockers in Park-and-Ride facilities or public transport stations*
b) *Public transport hub with shared micromobility services*
c) *Neighbourhood freight consolidation centre with last-mile delivery*
d) *Shared mobility point in housing estate*
e) *Etc.*

- Answer: ...

28. Describe which kind of hubs you are looking to deploy.*

- Answer: ...

29. Which aspects concerning mobility hubs are you most interested in?* *(Select a maximum of 5 options.)*

- Definition of clear objectives for a hub or network of hubs
- Location selection
- Service design
- Charging infrastructure
- Cooperation structure and partnerships
- Cooperation frameworks with housing companies or developers
- Business models
- Citizen participation
- Intra-hub traffic management
- Assessing the impact on the overall transport system
- Social impacts of hubs
- Upscaling mobility hubs
- Hubs integrating passenger transport and last-mile delivery solutions
- Other

30. Indicate best practices in terms of mobility hubs from your city you would like to share with your peers, if any.

- Answer: ...

D. Access regulation

In the following section, we will query about your current status and knowledge input in terms of low-emission zone (LEZ) / zero-emission zone (ZEZ) deployment and other forms of access regulation.

31. Is there a LEZ operational in your city?*

- Yes
- No

32. Is there a ZEZ operational in your city?*

- Yes
- No

33. Are there other forms of access regulations (e.g., limited-traffic zones, urban road tolls, congestion charge) operational in your city?*

- Yes
- No

34. If yes, please mention which type(s) of access regulations.

- Answer: ...

35. For each type of access regulations operational in your city, please specify whether it applies to either passenger or freight transport or both.

- Answer: ...

36. Is your city interested in implementing a LEZ, ZEZ, or other form of access regulations in the near future?* *(Check all that applies.)*

- LEZ
- ZEZ
- Limited traffic zones
- Congestion charge
- Urban road tolls
- No such plans for the near future
- Other

37. Which aspects of LEZ/ZEZ development or other forms of access regulations are you most interested in?* *(Select a maximum of 5 options.)*

- Regulatory aspects
- Stakeholders to engage
- Location determination
- Compensating measures to put in place
- Impacts to expects on businesses, logistics services, residents and how to ensure their buy-in
- How to measure the impact on air quality
- Logistics and deliveries for car-free zones
- Aspects having to do with inclusiveness (e.g., risk of gentrification)
- Impact assessment in general.
- Other

38. Indicate best practices in terms of LEZ/ZEZ or access regulations from your city you would like to share with your peers, if any.

- Answer: ...

E. Mobility-as-a-service (MaaS)
In the following section we will query about your current status and knowledge input in terms of MaaS.

39. Which kind of MaaS services are operational in your city, if any?*

- Answer: ...

40. At which territorial lever are those services operational (e.g., local, metropolitan area, functional urban area, regional)?

- Answer: ...

41. If not MaaS as such, does your city have an integrated platform for mobility service providers?*

- Yes
- No

42. If yes, please specify if the platform is open to all services providers or restricted to some.

- Answer: ...

43. How would you qualify the capacity to share data between those service operators and the public administration to best plan the overall MaaS system?

- On a scale from 1 (low) to 5 (high)

44. Does your city have plans for implementing a MaaS system in the near future?

- Yes
- No

45. Which aspects of MaaS deployment are you most interested in?* *(Select a maximum of 3 options.)*

- Developing a MaaS strategy
- How to design a MaaS ecosystem
- Data sharing between various service providers
- Cooperation structure for a MaaS system
- Business models for MaaS
- Integration of innovative services with more traditional ones
- How to make digital solutions inclusive
- How to upscale pilot solutions
- Which data to gather and how
- Other

46. Indicate best practices in terms of MaaS from your city you would like to share with your peers, if any.

- Answer: ...

E. Incentivisation and nudging

In the following section we will query about your current status and knowledge input in terms of behavioural approaches, as incentivisation and nudging.

47. Do you have incentives for employers to favour the sustainable commute of their employees?*

- Yes
- No

48. If yes, specify which ones.

- Answer: ...

49. Do you have incentives/rewarding schemes for commuters to use public transport, cycling, or other sustainable transport modes?*

- Yes
- No

50. If yes, specify which ones.

- Answer: ...

51. Do you have incentives for MaaS service providers?*

- Yes
- No

52. If yes, specify which ones.

- Answer: ...

53. Do you have incentives for urban logistics providers to switch to more sustainable trucks/vans?*

- Yes

- No

54. If yes, specify which ones.

- Answer: ...

55. Do you have incentives for building sites to sustainably manage waste and other logistics need?*

- Yes
- No

56. If yes, specify which ones.

- Answer: ...

57. Which aspects of incentivisation and nudging are you most interested in?* *(Select a maximum of 3 options.)*

- Choice design to trigger behavioural change
- Definition of the target groups to nudge
- Methods to trigger behavioural change
- Rewarding schemes in ticketing system
- Incentives to integrate passenger and freight transport
- Nudging components as part of the MaaS system
- Incentives/nudging for increasing the use of active modes
- Triggers to increase the use of MaaS.
- Citizen science methods
- Use big events as a catalyst for behavioural change
- Seasonal nudging (e.g., summer/winter active mobility)
- Other

58. Indicate best practices in terms of incentivisation and nudging from your city you would like to share with your peers, if any.

- Answer: ...

F. Role of urban nodes on the wider TEN-T network

In the following section we will query about your current status and knowledge input on planning at the Functional Urban Area (FUA) level.

59. Is the FUA for your passenger transport system defined?*

- Yes
- No

60. Is there a cooperation governance structure managing mobility at the FUA level?*

- Yes
- No

61. Who decides upon urban mobility policies at the FUA level?

- There is on specific authority at the FUA level
- There is a cooperation structure of various authorities at the FUA level
- There is no administrative structure, but authorities cooperate on a regular basis
- There are several authorities deciding and cooperation is occasional
- Other

62. Is the FUA for urban logistics defined?*

- Yes
- No

63. Who decides upon urban logistics policies at the FUA level?

- There is a cooperation structure of various authorities at the FUA level
- There is one specific authority at the FUA level
- There is no administrative structure, but authorities cooperate on a regular basis
- There are several authorities deciding and cooperation is occasional
- Other

64. To what extent do you consider the TEN-T level (i.e. the wider transport network, national or trans-European) impact when developing your mobility policies and measures?*

- Answer: ...

65. Do you monitor the impacts of the changes at TEN-T level on the local transport system?*

- Yes
- No

66. If yes, specify how?

- Answer: ...

67. Which aspects are you most interested in terms of TEN-T aspects?* *(Select a maximum of 3 options.)*

- Definition of your logistics FUA
- Definition of your mobility FUA
- Governance aspects in relation with planning and implementation at the FUA level
- Vertical policy coherence and how to reach it
- Integration of TEN-T aspects in local urban mobility and urban logistics planning
- Other

68. Indicate best practices in terms of TEN-T integration from your city you would like to share with your peers, if any.

- Answer: ...

G. Prioritising the measures/policies to replicate

In the two-way process envisaged in MOVE21, both living lab cities and replicator cities will replicate innovative successful innovative measures/policies already implemented in the other cities. This section aims to identify the priorities in each of the cities and, if possible, your specific focus or the measure/policy you already envisage to replicate from one of the partner cities. The measure/policy can be planned to be implemented in one of the LLs, or any measure/policy already implemented in one of the six cities involved in MOVE21. This is indicative as there is no complete mapping of the measure/policies that can be replicated at this stage.

69. Which of the above-mentioned areas would you like to prioritise for the replication activities in MOVE21?* (*Please organise the following themes in order of preference, with the one you have the highest interest in at the top.*)

- Sustainable urban logistics planning
- TEN-T integration
- Mobility hubs for people and goods
- Access regulations (LEZ/ZEZ/other)
- Mobility-as-a-service (MaaS)
- Incentivisation and nudging
- Other

70. If the case, please specify which area do you have in mind under “Other”.

- Answer: ...

71. Describe more precisely priority 1 for your city.*

- Answer: ...

72. Describe more precisely priority 2 for your city.*

- Answer: ...

73. Describe more precisely priority 3 for your city.*

- Answer: ...