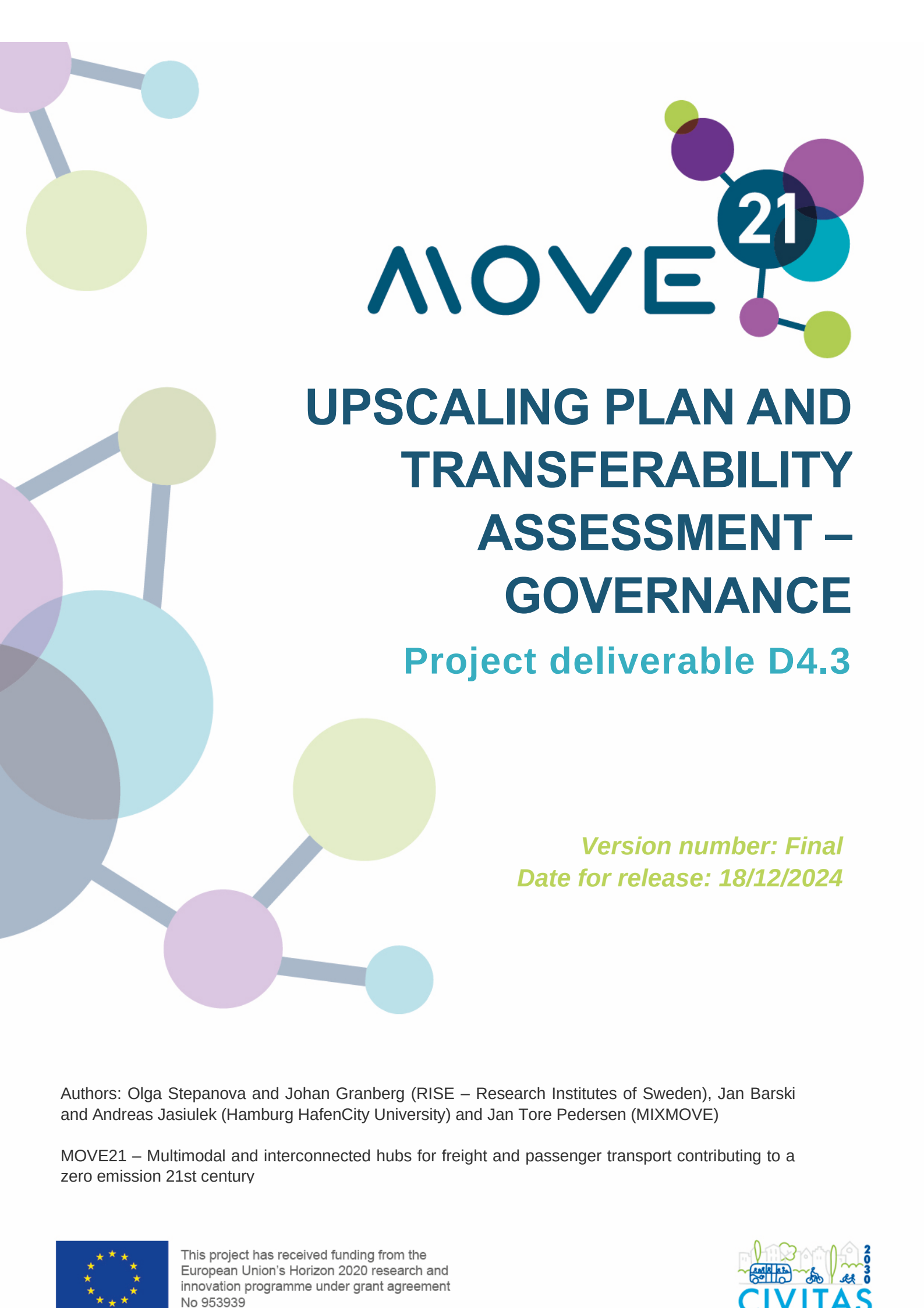




MOVE

21

UPSCALING PLAN AND TRANSFERABILITY ASSESSMENT – GOVERNANCE

Project deliverable D4.3

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



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Project Executive Summary

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

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

MOVE21 partners

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

- **Norway:** City of Oslo, Akershus 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

Key words

Governance, transferability, upscaling, Living Lab

Upscaling and transferability – governance

This deliverable focuses on the upscaling and transferability of innovative mobility and logistics solutions implemented in three Living Labs (LLs) located in Oslo, Gothenburg, and Hamburg. These solutions aim to transform urban areas into climate-neutral, connected multimodal nodes for smart and sustainable mobility. The deliverable's analysis highlights the potential for upscaling these solutions within the same city, and transferring them to other cities, emphasizing governance aspects.

In Hamburg, the multifunctional hubs at Holstenstrasse and Kaltenkircher Platz demonstrate significant potential for transferability. These hubs combine logistics, mobility, and social services, making them adaptable to various contexts. The flexibility in the services offered enhances their attractiveness for transfer. However, challenges such as the availability of public space and the need for governance-related efforts, including establishing contracts and regulatory frameworks, must be addressed. The micro-hub solution at Kaltenkircher Platz, which utilizes modular containers for diverse services, exemplifies a scalable approach that can be replicated in other urban areas of the city.

The Mobility Hotel in Nordstan, Gothenburg, serves as a successful example of consolidating services within a mobility hub. This concept, which includes shared fleets, battery swaps, and cargo bike hubs, is scalable and can be adapted to other dense city centres. The co-location of services creates synergies and enhances business opportunities. For successful transfer, strong governance processes, political support, and sustainable business models are essential. The integration of third-party parking apps and public bike-sharing apps at the Park and Bike Node in Klippan is a further example of the potential for transferability, provided there is a supportive regulatory framework and effective public-private collaboration.

In Oslo, the Mobility Hub Network has, through upscaling, significant potential to provide mobility and logistics services to new areas, making efficient use of existing resources. This measure is also attractive for transfer due to its innovative aspects and similar needs in many cities. However, legislative and regulatory frameworks, as well as operational concerns, need to be addressed for successful transfer. The Kaia Mobility Hotel in Oslo, inspired by the Mobility Hotel in Nordstan, highlights the importance of capitalizing on unused or underused space for mobility hubs. The success of Kaia and the upscaling of mobility hotels depends on expanding available services, attracting customers, and ensuring robust governance and financial stability.

The deliverable also outlines several key factors for successful upscaling and transferability. Governance preconditions, such as processes for experimentation, knowledge management, learning initiatives, and collaboration frameworks, play a central role. Existing regulations and guidelines must be adaptable to accommodate new measures. Cities with established processes for public-private partnerships, innovation project management, and stakeholder engagement are better positioned to transfer and implement new solutions. A supportive regulatory framework is essential for managing new solutions, including policies that enable the transformation of urban areas for innovative uses. An overarching political vision that sets clear priorities and stimulates collaboration is vital. Offering

potential partners new networks and business opportunities can make innovative solutions more attractive, fostering a culture of innovation and contributing to the long-term economic and social vitality of the city.

The MOVE21 project highlights several important lessons for upscaling and transferability. Understanding what is possible within the existing legal framework is crucial, as measures requiring even minor changes to legislation or policy are more challenging to implement. Developing attractive and sustainable business models is essential for engaging private partners. Public-private collaboration is a key enabler for implementing new solutions. Clearly defining the ownership and responsibility for measures is critical, including identifying who will lead and manage the initiative. Ensuring sufficient resources, both financial and infrastructural, is necessary for successful implementation. Measures must be tailored to the specific local context, including the constellation of actors, available space, and infrastructure.

To ensure the sustainability and continued impact of the initiatives beyond the project's lifetime, several factors must be considered. Establishing a clear mandate and identifying a responsible owner or facilitator for each measure is crucial. Developing business models that are financially viable and attractive to stakeholders is essential for long-term success. Strong political support and clearly defined priorities are necessary to drive the implementation and scaling of innovative solutions. Anchoring solutions within existing city development plans ensures alignment with broader urban strategies and goals. The role of key individuals, such as politicians, civil servants, and business owners, is significant. These individuals can inspire others and drive change. Civil servants with an entrepreneurial mindset can play a pivotal role in implementing and scaling innovative solutions.

Partnerships, particularly public-private collaborations, are vital for the long-term success and scalability of the initiatives. These partnerships can leverage the strengths and resources of both sectors, fostering innovation and ensuring that solutions are both practical and sustainable. Public-private partnerships can also facilitate the sharing of risks and rewards, making it easier to implement and scale new measures. By fostering strong, collaborative relationships, cities can create a supportive ecosystem that encourages continuous improvement and adaptation of mobility and logistics solutions. Addressing these factors can enhance cities' capacity to scale and transfer successful measures, contributing to more sustainable and efficient urban mobility and logistics systems.

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1 List of abbreviations and acronyms

Acronym	Meaning
API	Application Programming Interface
EC	European Commission
EU	European Union
GA	Grant Agreement
ICCP	Innovation Co-creation Partnerships
LL	Living Lab
PPC	Public Private Collaboration
PT	Public Transport
RC	Replicator city
WP	Work Package
WS	Workshop

2 Purpose of the deliverable

This deliverable, MOVE21 D4.3 Upscaling plan and transferability assessment - governance, builds on the previous analyses of governance innovation in relation to specific solutions that have been developed and deployed in the three LL cities – Oslo, Gothenburg and Hamburg. In these previous analyses (D4.1 and D4.2) potential opportunities and challenges related to governance and governance setups of LL measures were identified.

This deliverable takes a step further and aims to reflect on the solutions and demonstration measures that have been implemented in the LL cities with the specific focus on the potential for upscaling and transferability of these solutions, or their specific aspects, both within the same city and context, as well as to other cities and contexts, all through a governance lens.

A further purpose of the deliverable is to determine promising governance strategies and improvements for the mid-term and the long term (beyond 2030) solutions that come out of MOVE21 in LL cities and beyond. Recommendations for upscaling for the three LL cities are suggested to determine the potential and necessary conditions for city-wide deployments together with an assessment of the transferability of solutions to other cities.

2.1 Attainment of the objectives and explanation of deviations

The objectives related to this deliverable have been achieved in full and as scheduled.

2.2 Intended audience

The main audience for this deliverable is the MOVE21 project partners and stakeholders involved in the Living Labs (LL), such as LL project managers, involved city officials, Task Force members, Innovation Co-creation Partnerships members and a wider stakeholder group involved or implicated in the different measures. Furthermore, this deliverable is relevant for partners in other work packages in MOVE21, especially WP3, 5, 6 and 7. The deliverable is also aimed to assist the replicator cities of Munich, Bologna and Rome and the cascade cities of Stockholm, Toulouse, Thessaloniki, Brasov, Sofia and Murcia to better understand what components of different measures are suitable for transfer and replication and what factors need to be taken into account when considering their upscaling or replication in other contexts. Based on the LLs' practical experience of solutions' implementation, the report draws attention to the challenges that implementation and upscaling of measures may entail, how some of such challenges may be prevented, tackled, or avoided; what needs to be considered when scaling up or transferring measures or their specific parts to other contexts to make their establishment smoother.

Finally, this deliverable is of interest for cities, decision-makers, local politicians and practitioners who are interested in knowledge and lessons learned on upscaling and transferability potential of the measures developed and deployed in MOVE21.

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

The deliverable starts with a description of the methodology used, including workshop series and governance analysis. This section also defines key terms such as replication, transferability, upscaling, and governance innovation. Then a chapter for each LL follows, where subchapters on each measure are provided. They begin with a detailed description of the development and content of the respective

test site, after which an analysis of the transferability of different aspects of the measure implemented to other contexts and cities follows before, when applicable, recommendations for upscaling of the measures within the LLs are provided. The deliverable ends with a synthesis of the key findings, focusing on the potential for upscaling and transferability of the implemented solutions, critical factors influencing success, and lessons learned.

This deliverable is connected to WP3, 5, 6, 7, 8, 9 and 10 in MOVE21. The primary link is to WP3 and WP5 through the integrated approach in methodology and data collection, common set up, and the description of the relevant measures in the three LLs that are shared among WP3, 4, 5 (see 3.1 Methodology section for details). Another strong link of this deliverable is to WP6 and the LLs. The present deliverable also makes use of the deliverables and analyses produced within WP7, namely D7.2 and D7.3.

In August 2023 D7.2 was released and presented Replication action plans for the three LL cities and three Replicator cities where cities themselves identified measures they deemed replicable from other cities and contexts in MOVE21. D7.2 applied a robust methodology for the analysis of replicability of the measures, which is also acknowledged and used as a point of reference in the present D4.3. D7.3 was released in August 2024 and presented Action plans for replication of measures in the six cascade cities.

There is further a link to WP8 through the data collected in logbooks that document instances of governance innovation in the LLs. This data is used as a secondary data source for D4.3 among other data sources (see 3.1 Methodology and approach section). The work on exploitation management in WP9 has benefited the understanding of upscaling and transferability. Finally, infographics developed in WP10 have been used as basis for the measure descriptions, in order to provide clear and concise explanations.

These links are illustrated in Figure 1.

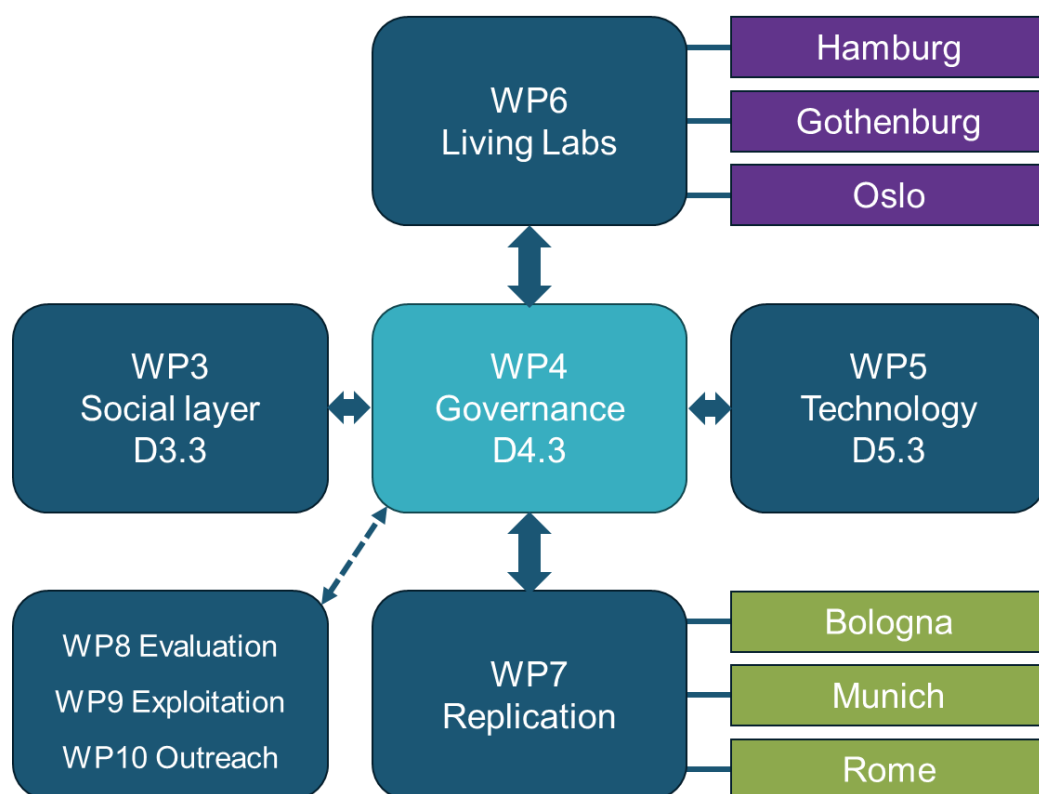


Figure 1 D4.3 links to other Work Packages in MOVE21

3 Method and definitions

3.1 Method

This deliverable builds on D4.1 and D4.2 that provided a Governance Innovation analysis of the respective LL city and across the LL cities following the progress of the measures from the governance innovation perspective.

It further draws on Milestone 3 (MS3) internal report within WP4 which presented the analysis of the capacity and contexts for governance innovation in the LLs of Oslo, Gothenburg and Hamburg. Specifically, the analysis was done in relation to the measures the different LL cities piloted. MS3 performed the analysis of governance initiatives in each LL city, identified specific governance environments and pinpointed critical factors such as strengths and weaknesses (enablers/disablers) for governance innovation in each city.

There has been significant progress in the implementation of measures since D4.1 (January 2022) where only general features in the three LL cities were formalised due to early stage of establishment of the pilots. The MS3 report was released for internal use in May 2023 and provided an update on the development that happened at the test sites since January 2022 until May 2023. D4.2 presented an updated picture of the progress in each LL since May 2023 until end of October 2023. Many activities related to the establishment of test sites and pilots took place and started functioning over the summer of 2023.

D4.3 recaps the progress the LLs have made until October 2024 and focuses on the upscaling and transferability of the solutions adapted in test-sites, all from a governance perspective.

The methodological approach for D4.3 has been developed in collaboration between WP3, 4 and 5. There are two reasons for it. First, WP3, 4 and 5 all have a common theme of upscaling and transferability of the proposed solutions, but focus on different empirical areas, such as social innovation, solutions and sustainability (WP3), governance innovation (WP4), and technical solutions (WP5). Second, all three WPs base their analysis on the most relevant and up-to-date data collected from the LLs in Oslo, Gothenburg, and Hamburg. To make empirical data collection concise for the LLs, a decision to convene a series of workshops (WS), jointly owned and led by WP3, 4, and 5, was made. The jointly developed method and coordinated data collection enabled avoidance of redundancies and unnecessary repetitions for all the involved parties and facilitated timely analyses in all three collaborating WPs. The respective WP's analysis also benefitted from the deepened joint discussions.

The WS series participants from each LL, therefore, got an opportunity to reflect on the different aspects of measures they have implemented within the frames of one occasion (one workshop per LL), keeping the discussion and reflection within one common overarching theme of upscaling and transferability potential of these solutions or their specific elements.

Furthermore, as a point of departure for the D4.3 governance analysis we refer to the work made earlier within WP7 with the help of the transferability assessment tool (presented and used in WP7 deliverables D7.2 and D7.3). The current deliverable utilises WP7 Replication action plans, that were developed in 2023 by the LLs and the replicator cities (D7.2). This approach was most suitable for the governance perspective; thus, this was not part of the joint methodology, which will be further highlighted below.

3.1.1 Workshop series

In September 2024, WP3, 4, 5 convened one physical workshop with each LL Task Force. The three workshops gathered between 8-14 participants each, in addition to the three WP leads present in the room facilitating the discussion. The allocated time was for a full business day with an hour lunch break included. The discussion focused on the three thematic areas relevant for the WPs: social innovation, governance innovation and solutions, and technological solutions and their potential to be upscaled and transferred to other contexts and physical locations.

The WS were built around two methodological tools that were used in combination to facilitate the discussion about every measure for every test-site in each LL:

- *Rose, Thorn, Bud method* – for each measure, participants write Post-its of three different colours: one colour for „rose” – summarize positive aspects of a measure, one colour for „thorn” – negative aspects of a measure or risks to watch out for when implementing a measure, and one colour for „bud” – participants list opportunities to grow and develop this measure (upscaling). The post-its are then put on one chart and discussed in the group. This method allows the participants to reflect on both positive and negative aspects and experiences connected to the implementation, and possible upscaling and replication, of a measure. The WS participants were asked to reflect broadly, while it was up to the WP leads to interpret the answers through their respective lenses (social, governance, and technology).
- *Sticky Steps method*, is a version of back-casting method – for each measure, on the far-right side of a large paper or board, the workshop conveners, together with the participants describe the desired end-state of a transfer or upscaling of a measure. Just left of it, the conveners pose the question “*what (one step) would have to happen for this to succeed*”? Participants answer on post-its. The conveners collect them and, left of those post-its, ask the same question again. Participants answer, and the cycle repeats until we’ve reached the beginning of upscaling or transfer process, which ideally is close to the current state. This method allows the participants to articulate enabling and hindering factors for each measure to be implemented, upscaled or transferred, and is applicable for identification of necessary steps to be taken in relation to any desired state to be achieved. Again, the WP leads were responsible for making sure that WP specific elements were highlighted.

The two methods were applied sequentially for each measure in each LL.

These methods were selected to foster a creative environment where all participants, both those with extensive experience in the project and those with more limited exposure, could provide valuable input. It also acted as a counterweight to the, often critical, in-depth interviews conducted earlier by the WPs. This was valuable for the topic of upscaling and transferability, since the focus there needs to be on what works and how it can be made to work even better.

Naturally, the methodology chosen for data collection in this deliverable also has limitations. One, that the workshops were very city-dependent. It is much more difficult, and less interesting for the LL members to reflect critically and creatively on possibilities for transfer to other cities, than it is to reflect on upscaling potential within their own LL. One partial remedy to this was to view upscaling as a subset, and that some form of local transferability to be necessary for upscaling to take place. In other words, transferability is seen in this deliverable as a broader term within which some aspects of, or whole solutions, may be upscaled if deemed relevant. An additional approach was considered, that could potentially have increased the focus on transferability, to involve the Replicator Cities as sounding boards. However, due to their more limited knowledge about the solutions, their focus on what would

work in their cities and not general transferability, as well as practical and scheduling concerns, this idea was not exercised.

Another limitation was the duration of the workshops. There were, in all three workshops, topics that could have benefited from additional time for discussion. At the same time, the workshops were close to a full workday including a lunch-break, and the enthusiasm, creativity, and quality would have been adversely affected by stretching the workshops much longer than the arranged time. Another day of workshops were deemed unfeasible, mainly due to scheduling, logistics, and cost. To manage this, and to dive deeper into a few interesting topics, other data collection, such as interviews and analysis of logbooks, complimented the workshop results.

While the interviews and workshops are the primary basis of the analysis, the compiled conclusions and reflections in the deliverable are those of RISE analytical team.

3.1.2 Assessment of transferability and upscaling potential

The main sources of information for the assessment of transferability and upscaling potential were the workshops described above, complimented with written information from the LLs, e.g. from the logbooks. As a frame of reference and as an attempt at quantifying the aspect of transferability, WP4 used assessments from the replication action plans in D7.2. These assessments put a strong emphasis on governance aspects, that is why it was natural for WP4 to reference it, and less beneficial for the adjacent deliverables in WP3 and WP5.

3.1.2.1 Use of the replication action plans

The transferability assessment tool from D7.2 has been used by the LL and replicator cities to map and assess transferability potential of measures from other cities to their local contexts (Table 1). Also, a reflection on the expected challenges in relation to transferability was made by each city. However, in D7.2 the cities motivated the choice of only *one* or *a few* measures from other MOVE21 cities, which answered their needs and that they deemed transferable to their context, whereas the present D4.3 considers *all* the measures applied in the LL cities offering a more comprehensive analysis and general reflection across the cities. Moreover, in contrast to what has been done in D7.2, in the current D4.3 the LLs reflect on transferability and upscaling of *their own* measures to other contexts, not the other way around.

This methodological difference makes it difficult to fully match the methodologies between D7.2 and D4.3 for D4.3 to fully build on D7.2 and D7.3. Nevertheless, we use the conclusions from D7.2 as a point of departure for the discussion of transferability and upscaling of the measures in each LL. The conclusions from the Replication action plans (D7.2) also serve as an initial triangulation of the transferability possibilities from other cities` perspective and allows us to follow up on transferability and upscaling potential from one year to the next (2023-2024).

Table 1 Summary of replicated measures (source: D7.2, Table 25)

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

Table 2 Transferability assessment scoring criteria (source: D7.2, Annex B)

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

Note for Table 2: For elements that scored under 4, the cities provided an assessment of the potential challenges in replication and transferability of the measure. This assessment gives us a good ground for comparison with how the LLs see these potential challenges when they reflect on the measure's transferability and upscaling themselves.

3.1.2.2 Governance analysis

Using the Replication action plans produced in 2023 (D7.2), we draw on their assessment of single measures and their potential transferability as a point of departure for our analysis. This allows us to see how cities' perception and assessment of transferability of some measures changed between 2023

and 2024. Importantly, we limit our discussion to governance related aspects due to the WP4 focus on governance innovation.

Using the data collected, and WP4's interpretation of LL participant's answers, the measures are sorted into three (coarse) upscaling and transferability categories, based on their potential. These categories are:

- Challenging: measures that, from a governance perspective, do not have a straightforward potential for upscaling or transferability,
- Intermediate: measures that, from a governance perspective, have potential, that might be situation specific, for upscaling or transferability,
- Promising: measures with clear, from a governance perspective, potential, in different settings, for upscaling and transferability.

These categories are, naturally, somewhat subjective but will still be of value for cities considering transferring or upscaling of measures. This will still need to be complemented by an analysis, maybe based on the replication assessment framework, to make sure that the locally specific conditions for transferability are in place.

3.2 Definitions

To ensure coherent use of terminology across the three sister deliverables (D3.3, D4.3, D5.3), this subchapter sets the common understanding of three key concepts.

3.2.1 Replication

Replication is the activity of duplicating, copying, reproducing, or repeating innovations or good practices that have been successfully tested in other places or cities and regions. It involves the use of lessons learned from pilots and demonstrations and applying them elsewhere.

MOVE21 has reserved the term replication to its partner Replicator Cities and the dedicated Work Package (WP 7). For this reason, deliverables 3.3, 4.3, and 5.3 apply transfer to denote replication between cities and upscaling to denote replication within the same city.

3.2.2 Transferability

In the simplest understanding, this term describes the presumed readiness, meaningfulness, and success chance of something to another setting. It is a spectrum and can therefore be evaluated with adjectives such as low or high, or as in this deliverable, challenging, intermediate and promising.

In the concrete context of the MOVE21 project, and in the even narrower context of deliverables D3.3, D4.3, and D5.3, the objects of each transferability consideration are elements of solutions that together form the MOVE21 measures. The three Work Packages assess, each with its thematic lens, the aforementioned readiness or meaningfulness or success chance of a given element of a given measure to *another* city (=other than the city where the measure is hosted).

In theory, an element of a measure is the more transferable the more successful it has proven to be within the MOVE21 project already; the more clearly defined it is; and the easier it is to define the conditions in which it was or could be successful. Importantly, transferability stands for a potential. If transferability is acted upon, a transfer process is taking place.

3.2.3 Upscaling

Deliverables D3.3, D4.3, and D5.3 define upscaling as multiplication of a given measure or its elements *within* the same city. It may also mean increasing the size of an existing measure.

With such a set-up of the analysis, the three deliverables follow the CIVITAS method of estimating the effects of a measure (or elements) if it/they were applied throughout the city in more copies or instances. This way, the analysis may support the MOVE21-measure host city about the potential for further deployment.

The term could in MOVE21 theoretically also encompass upscaling of a measure beyond a city, to regional, national, or international scale. That is, however, not within the scope of three deliverables.

3.2.4 Governance innovation

WP4 analyses governance and governance related aspects which affect the ability to deploy proposed solutions, both during the first implementation phases and towards upscaling and transferability efforts:

1. Assess the conditions for change based on existing governance structures and mechanisms in each LL which includes the identification of regulatory and organizational constraints for upscaling.
2. Recommend specific governance related measures that aim to increase innovation capacity and thus increase the likely success of proposed solutions and efforts to upscale these.
3. Provide new governance and collaboration models that enable and support new mobility and logistics solutions or the combination thereof.
4. Provide knowledge and expertise to support LL and replicator cities in creating new policies to support innovative solutions.

WP4 identifies conditions that enable or hinder innovation, how such governance related barriers for implementation may be overcome; it further identifies conditions that enable and stimulate co-creation, tailoring, deployment and upscaling of the proposed measures and solutions. Based on this knowledge, WP4 also provides expertise to increase innovation capacity in the LL cities. WP4 will provide recommendations for upscaling for the three LLs, identifying under what governance conditions upscaling of successful practices and solutions will be possible. The lessons learned in LLs (both successful practices and strategies as well as pitfalls to watch out for when planning implementation of innovative solutions) will further be relevant for replicator cities, cascade cities, and beyond, as they will help increase and improve their innovation capacity and provide learning/knowledge exchange on a greater scale (D4.2).

Governance in the literature has focused on social coordination (Moore and Hartley, 2010), it can be defined as 'new ways of governing', including participatory and collective decision-making, along with conventional forms of government. Governance as 'governing beyond the state' can be understood as striving towards new governance arrangements including collective participation in decision-making and co-production, especially at the local level (Galego et al., 2022).

Governance in the context of this project relates to the mechanisms, processes, relations, and interactions used to organise the provision of public goods and mobility/logistics services provided both by public and private partners (e.g., the city, private mobility/logistics companies) or pilot projects (e.g., LLs). It includes elements such as:

- Policies and goals (on different levels, e.g. local and regional level);

- Relationships and divisions of rights and responsibilities between different actors (e.g., different organisational departments of the city, between providers of services within mobility and logistics), citizen involvement and participation in decision-making;
- Capabilities and leadership.

Governance innovation in the literature is discussed at the intersection of two different literatures: literature on innovation, that historically focused on the private rather than on the public sector, and on innovations which improve organizational performance through product and process innovations rather than on public sector innovations which seek to improve social performance through reorganizations of cross-sector decision-making, financing and production systems (Moore and Hartley, 2010), and the literature of governance, which focused primarily on social coordination.

According to the literature, innovations in governance: go beyond organizational boundaries to create network-based financing, decision-making and production systems; tap new pools of resources; exploit government's capacity to shape private rights and responsibilities; redistribute the right to define and judge value; and should be evaluated in terms of the degree to which they promote justice and the development of a society as well as by their efficiency and effectiveness in achieving collectively established goals (Moore and Hartley, 2010, p.68).

Both (social) innovation and governance often involve collaborative practices between civil society organizations and public actors to develop alternative solutions to meet social needs, and often face comparable socio-political challenges (Galego et al., 2022).

Governance innovation in the context of this project is twofold. On the one hand, it concerns developing better ways to organise and govern, with the goal of significantly improving the provision of goods and services to the public. On the other hand, it is understood in its broader connotation which includes any kind of new public-private collaboration schemes or new ways of working together, that define new ways of how specific mobility and logistics services are provided. For example, a specific and defined division of roles between public and private actors in case of collaborative running of an urban consolidation centre is a form of governance innovation because such collaboration has not happened before.

Governance innovation is one of the central aspects of the MOVE21 project. Through governance and policy innovation the project supports the ability of decision-makers to design, deploy and monitor policies that enhance synergies between different policy and planning domains, which ultimately ensures greater integration between policy and planning. That integration, in turn, is a prerequisite for reaching ambitious 2030 and 2050 climate goals.

The challenge to align or integrate planning mechanisms has strong parallels with the discussion on environmental policy integration that has shown that win-win solutions are possible if policies are combined and/or aligned rather than developed independently. The purpose of MOVE21 is to increase policy coherence and align or integrate policy planning related to mobility, logistics, infrastructure, energy, and spatial planning to deliver on the multiple targets of the cities while increasing liveability and attractiveness of cities as places to live, work and invest in all participating urban nodes (D4.2).

Replicator cities, cascade cities, and cities beyond can learn from governance innovation experiences and practices tested in the LLs through positive (although context-specific) examples, and from barriers and challenges that LLs faced when trying to plan and/or implement innovative governance measures.

4 Hamburg

This chapter provides, in separate subchapters, an overview of the development and content of the test sites in Hamburg. It details the specific measures implemented, highlighting their unique features and the context in which they operate, to set the stage for understanding the practical applications of the MOVE21 project and the innovative solutions tested in these urban environments.

Thereafter, each measure's estimated transferability to other cities is analysed (builds on the perception of the LLs and the replicator cities, from workshops and from D7.2 respectively) and presented. Some measures are elaborated on in greater depth than the others following the chosen methodology and based on the data collected from the LLs, while some have not been explored due to lack of maturity.

Lastly, recommendations for upscaling of the different measures in are provided. The upscaling recommendations build on the reflections from the LL cities themselves that were collected during the workshops and interviews (see methodology section), complimented by analysis from the WP. Not all measures have been recommended for upscaling.

4.1 Multifunctional neighbourhood hub Holstenstrasse – combining logistic offers with social services

4.1.1 Overview of the measure

The multifunctional neighbourhood hub (*multifunktionaler Quartiers-Hub*) Holstenstrasse is located in Altona, the westernmost district of the city-state of Hamburg. Altona houses some 280,000 inhabitants, standing for around 15% of the city population. The hub is located at the district's eastern edge, very close to the city centre and its famous leisure activity neighbourhood of Reeperbahn, in an area of mixed housing and services use. The official opening of the hub took place in mid-February 2023 and consisted of a formal event for press and political representatives as well as an Open House event for all interested citizens and local residents.

The neighbourhood hub Holstenstrasse reduces logistics traffic and introduces climate-friendly solutions; moreover, it provides support and consultations for local residents and the homeless. The hub addresses shortage of space with a multi-functional concept that can be adapted and scaled in potential further neighbourhood hubs in Hamburg and beyond.

Operation of the logistics services (deliveries of packages and other materials via electric cargo bikes) and social services (consultation kiosk; food and basic supplies distribution to the needy) have continued uninterrupted since the opening in 2023. The logistics services are performed by three companies: Hermes and GLS for package deliveries and CityLog, which makes direct deliveries to businesses (mainly builders). The goods arrive in the early morning via transporter (conventional vehicle) at the hub and are sorted for out-going delivery via cargo bike. The logistics users are thus present at the hub, in varying constellations depending on who is in-taking or delivering their goods, from around midnight until completion of final deliveries and return of bikes to the hub during the day.

The social offers at the hub have two components. The consultation kiosk, in the smaller office space, accommodates both an open consultation session for any interested persons once per week, as well as provides a location for other social service meetings or groups, scheduled at other times. The food and basic supply distribution, using the kitchen, food prep area, and basement, operates Fridays

through Sundays. Deliveries of food and supplies are also scheduled during the week, to allow time to sort and prepare the goods for distribution.

4.1.2 Transferability assessment from the Hamburg LL point of view

Transferability of this measure, or its specific aspects, depends on the functions that are attributed in the concept of a hub by the implementing actor. As there are no strict regulations regarding what a mobility hub should contain, the implementing actor can decide what services and activities populate the specific hub. These services are much context dependent and need to be tailored to the local needs to make the hub relevant for the users. The concept of a hub serves as a signifier for mobility, logistics and other services gathered in one location. Furthermore, due to its conceptual openness, a mobility hub solution is flexible and adaptable to the local conditions which makes it attractive for transferring to other contexts.

Several characteristics of the hub make its transferability possible. For example, variety and different combinations of uses. This feature expands the potential for acceptance and upscaling of the hub and its uses. Shared resources and shared space stimulate the set-up of the hub, make it more attractive for the stakeholders and users. Anchoring the hub solution in the local context, preconditions and needs facilitates acceptance of the hub by the local residents, users and partners which also facilitates transferability.

The hub in Holstenstrasse has a unique feature – it combines logistic, transport and social services. Logistic and transport solutions tend to be better accepted by the users if there is a social benefit or a social dimension to them. Through adding a social dimension to the mobility hub, the implementing actor may target the solution towards more specific user groups. This aspect is seen as an advantage to the transferability of this measure to other contexts. Furthermore, inclusion of further innovative services and partners to the hub may be a way to think outside of the box and attract new partners in different constellations thus making the hub more attractive for the users and stimulating transferability.

4.1.2.1 Anticipated difficulties

Overall, there is a lack of experience with the implementation of logistics/mobility hubs. In particular, contracts for the use and operation of hubs are a new territory for local governance processes, together with the tendering process criteria and content for the shaping of the infrastructure. Another difficulty is the availability of the public space. It is one of the biggest barriers to transferability. In order to address this issue, one might need to engage private property owners to find available space well in advance. For example, car parking and housing associations could be approached.

When it comes to the governance side of transferability of such solutions, presence of the adequate legislative framework is important. For instance, there needs to be a decision on the financing conditions of the participating actors with the goal of establishing a sustainable and viable business model that would not require additional economic support. Moreover, other legislative conditions need to be worked out, such as the regulation for placement of logistics areas in a public space.

Overall, governance related efforts are the cornerstone that holds up or hinders transferability and implementation of the measure in other contexts. For example, contracts for the operation of the hub (such as operating contract between the city as landowner and the municipal subsidiary as operator as well as user contracts between the municipal subsidiary and the logistics companies) are necessary, they need to be adapted and signed by all the participating actors. This procedure might be lengthy and require additional time and resources.

4.1.2.2 *Transferability from the replicator cities' point of view*

In case of the **Neighbourhood Hub**, the following characteristics were named as the most attractive to transfer: a vacant space transformation into a multifunctional hub for the transport of parcels and goods to reduce traffic with deliveries and pick-ups with electric cargo bikes; a multifunctional concept that addresses the existing shortage of space; the establishment of a test site for innovative and sustainable last mile logistics processes (micro-hub and cargo bike delivery).

Two main aspects of this measure were seen as particularly interesting: the co-existence of various logistics users in the same space and the business model for multi-functional and multi-user hub (contracts, operators, ownership status) which aims to function without project-linked funding. In some transferability contexts, the measure would fit well with the current political goals and green transport strategies. The importance of the local political support was highlighted as one important precondition for the measure to be transferred.

4.1.3 Upscaling recommendations

Scalability of Holstenstrasse neighbourhood hub or its specific aspects, depends on the functions that are attributed in the concept of a hub by the implementing actor. Upscaling may be achieved through the spectrum of services that the operating actor chooses to put into the hub. Anchoring the hub solution with its specific combination of services in the local context, preconditions and needs facilitates upscaling. The hub is also scalable by, for example, widening the scope of services and mobility solutions that are offered in the hub, making urban logistics more palatable for authorities as a result. The analysis of the hub practice suggests that properly regulated public-private partnerships may be used as one possible tool to facilitate such an upscaling.

4.2 Multifunctional neighbourhood hub Kaltenkircher Platz – combining micro hub with mobility uses and recycling services

4.2.1 Overview of the measure

The test site is situated at the parking lot across the Kaltenkircher Street in the north-eastern part of Altona. The location is at a major traffic junction with frequent high congestion, overlooked by several railway viaducts, and walled by residential and service buildings. Previously it was a singularly used site, a parking lot, but now it offers the improved sustainable mobility solutions for people, new modular micro-depot system to reduce the emissions and traffic at last mile deliveries in the neighbourhood and a spot for recycling diverse materials and goods (EcoHHub station). Designed to serve multiple purposes, the development of this multifunctional hub was a process completed with the successful inauguration of the site in October 2024.

To facilitate the utilisation of the site for logistical purposes, the individual modules of the micro-depot were built from light-weight containers, so that they fit into regular parking spaces. The primary use for logistic purposes is just one of many potential applications of the system of containers, which can be adapted to suit different requirements (e.g. charging for micromobility, e-bikes, and/or smart locker system). The modular micro-depot receives goods via established logistics networks and distributes them from this location on the logistical last mile, using emission-free cargo bikes. The micro-depot also has the potential to serve as a start and end point for inter-hub traffic owing to its proximity to the commercial and industrial areas and the A7 motorway, thus connecting to the TEN-T corridor.

The incorporation of new mobility infrastructure served to enhance the existing bus stop. In addition, protected bicycle racks and a parking zone for e-scooters have been implemented. In result, the hub

now offers a car-sharing station (hvv switch), the micromobility parking zone. Plans for a pop-up bike-sharing station in the near future are in discussion. The new pathways facilitate improved connections to the neighbourhood, the bus stop, and the other mobility services. These improvements encourage the use of active and combined sustainable mobility solutions.

Furthermore, a novel model of a recycling station (EcoHHub) for the collection of recyclable and reusable materials has been installed at the site (a successful cooperation with the local project partners of the Interreg North Sea project MoLo Hubs with regards to people-centric Mobility and Logistics). This illustrates the adaptability of the multifunctional concept to accommodate additional models and services.

4.2.2 Transferability assessment

4.2.2.1 From the Hamburg LL point of view

The attractiveness of the solution is weighed up by the potential difficulties that may impede transferability and thus need to be considered when planning the micro-hub solution. Behaviour and normative change regarding (multiple) uses of a place is one such difficulty. It refers to the possibility to convince the users and potential partners to re-imagine and normalise the different uses of parking places, taking away the norm of priority and dominance of personal cars in the city.

Another aspect that needs to be solved in advance prior to transferability of this solution is the availability of public or private parking space to be repurposed towards a micro-hub concept. Finding partners to operate the services in the hub may be challenging depending on the location and the local needs, difficulties in engagement, available resources and time may be foreseen. These foreseen difficulties may be tackled through the initial identification of the actor who will manage and govern the solution, the main responsible and implementing actor. The governing actor is key to the successful transferability and upscaling of the solution, because it makes the most important decisions about the services and uses that will be offered in a particular hub in a particular location that is much context specific.

4.2.2.2 From the replicator cities' point of view

The following aspects were named as some of the most attractive to transfer in case of the **Mobility Hub Kaltenkircher Platz**. Establishing public parking spaces to facilitate the implementation of more environmentally friendly logistics and mobility solutions; creating test sites for pioneering and sustainable last-mile logistic processes, such as MicroHub and cargo-bike deliveries; introducing enhanced mobility services, encompassing car sharing, bicycle parking, micro-mobility options, and public transportation, all contributing to a sustainable and multi-modal transportation network.

The following challenges were anticipated by the cities which planned to transfer the solutions: i) the underdeveloped or inadequate legislative and local regulatory framework for implementing these measures. Addressing this challenge, external assistance would need to play a crucial role in thoroughly comprehending the legislative and regulatory intricacies, as well as the prerequisites essential for executing the measure at the local level; ii) governance-related endeavours and issues.

The replicator cities mentioned their lack of experience and processes to find and involve all the potential stakeholders, in particular the logistic operators, and would need external support to realize this task. To address this challenge, external assistance would need to be enlisted to establish a network of logistics operators who can potentially participate as stakeholders during significant events. Regulatory and legislative landscape was mentioned as one of the key enabling or disabling factors that would need to be addressed in case of transferability of these measures.

4.2.3 Upscaling recommendations

In Kaltenkircher Platz the micro-hub solution may be already seen as an upscaling of the hub introduced in Holstenstrasse. The hub's feature of combined, flexible and variative services and uses that are offered by the micro-hub is particularly attractive for the local users and partners in case of upscaling. This aspect together with the flexible use of common space (parking), is an attractive factor that may enable upscaling with different, more diverse services and multiple target user groups.

4.3 Combining transport of goods and people with a regular bus line

4.3.1 Overview of the measure

In late 2023, the Hamburg LL tested for eight weeks a combined transportation of passengers and goods shipments by regular bus in the neighbourhood Rissen, an area located in the western part of Altona and consists of urban as well as rural structures. From October to December 2023 residents could have goods that they bought in local stores in Rissen delivered to their nearest bus stop by village coach (bus route 388). The aim of the new service was to use resources and capacities of buses more efficiently, reduce climate and traffic pollution, and promote the network of local stakeholders. The pilot tested the simultaneous transport of passengers and goods by bus. The initiative focused primarily on the elderly, offering them a convenient delivery option without the need for additional travel. It was also available to people with reduced mobility, ensuring inclusive access for those with limited mobility. The participated local stores offered various goods like books, bakery products, limited groceries, clothing, shoe repair services, locksmith services, and tailoring for delivery.

Interested parties selected their goods in a local store or ordered them by telephone or e-mail if this is offered by the store. Payment was made directly on site or on account. During the purchase process, buyers entered their telephone number so that they could be contacted during the subsequent delivery process. After the purchase, the goods were packed in the store. The respective store then informed the bus operator VHH employees who would collect the items from the stores, sort the items and discuss the collection time at the desired stop with the customer. The employees also handed over the order at the stop.

One delivery was made by bus during the test. Nevertheless, interesting lessons were learned. For example, the Hamburg LL was able to set up such a service with greater involvement of stakeholders such as the public transport company and retailers, as well as including the delivery service during regular business hours. In addition, liability issues relating to the goods transported were clarified.

4.3.2 Transferability assessment

This measure offers an opportunity to demonstrate the feasibility of transporting goods in public transport, combining transport of people and goods. However, the measure is not fully developed but has the potential to be transferred to any other place with suitable public transport system. In theory, the measure could be transferred to other contexts given that there are no legal and regulatory hindrances which are one of the key aspects for transferability of such solution. One needs to investigate what is possible to do within the local legislation and what possible limitations there might be. Additional aspects to consider before transferring the solution are related to the presence of the preconditions for creating sustainable business models for the participating partners, e.g., long-enough distances, attraction of the potential users, amount of goods.

4.3.3 Upscaling recommendations

Upscaling has not been recommended for this measure.

4.4 Combining transport of goods and people with an on-demand service MOIA

4.4.1 Overview of the measure

Mobility services for people have low use rates outside peak hours that city couriers and urban logistics operations could use, but these have often designed processes so efficiently that co-use without suitable logistic infrastructure, time and route flexibility is difficult. With this in mind, Hamburg has tested the combined transport of people and goods in an on-demand ride-pooling service (Ruohonen et al 2024, p. 13). Hamburg's second pilot study on the feasibility of integrating the transportation of both people and goods was conducted from March to May 2024 and has built on the lessons learned from the first pilot, this time primarily using the on-demand shuttle service, MOIA. Approximately 10% of the deliveries were made by public transport and another on-demand taxi service. The objective was to evaluate the potential benefits of more flexible transport services in terms of travel times and routes, and their impact on the quality of the delivery service. City couriers in Hamburg are usually responsible for single transport orders within the city, and another key objective was to see a reduction in empty runs and increase the use of the on-demand shuttles during midday hours. The goods offered for delivery were smaller shipments of up to 20 kg within the inner-city (ibid., p.13).

The measure addressed the challenges of implementing a combined transport system with a ride-sharing provider in an urban environment, focusing on service availability, reliability, costs and environmental impact. By testing the system in a real-world environment, the aim was to identify problems and develop efficient solutions to resolve them.

To ensure the viability of the proposed solution, the pilot project transported city courier shipments in addition to sample consignments to test additional scenarios. This was done in addition to real consignments, for which two voluntary social welfare organisations, Hanseatic Help and Der Hafen Hilft, which distribute donated clothing and household goods to other social welfare organisations, agreed to participate. All test consignments were conducted within the MOIA operating area of Hamburg, with the use of emission-free vehicles, this contributing to emissions reduction.

The implementation of a combined transport system with a ride-sharing provider in a city presents a number of challenges, including those related to the availability and reliability of services, as well as costs and financing. Furthermore, potential environmental impacts must be considered, such as the number of vehicles needed, how often they would run etc. A test run in an urban environment enables the identification of these issues and the development of efficient solutions. Overall, the combination of passenger mobility and goods transportation offers an innovative solution to reduce costs and emissions. Cooperation with social institutions and aid organisations also promotes the common good and strengthens solidarity within the community. In the test run, goods were transported free of charge for the customer.

4.4.2 Transferability assessment

This solution offers an on-demand service that focuses on the combination of deliveries/urban parcel logistics and public transport. The most attractive aspect of this measure is that it utilizes the available resources (private on-demand buses that complement traditional public transport) and capacities and does not require additional resources for implementation. This solution may be transferred as a community delivery concept that is flexible due to its on-demand feature. It is also adaptable to the local needs due to its detachment from the need of large (new) infrastructure. It does not need a large number of other partners to be involved either.

However, several governance-related aspects need to be considered when transferring this measure. These aspects are related to the existing local regulations of the public transport, e.g., where the delivery is allowed to stop, what the logistics related permits are and how they should be obtained. Furthermore, regulations and governance-related incentives might be needed to stimulate private companies to participate in this innovative solution. Another aspect to be cleared out before transferring is the ownership of the measure – how it will be managed and by which organisation. Finally, the measure is sensitive to the local preconditions and the set-up of actors who participate in the measure, as well as the potential users of the services.

4.4.3 Upscaling recommendations

This solution has the potential to be upscaled as a community delivery concept that is flexible due to its on-demand feature and adaptable to the local needs due to its detachment from large infrastructure needs, as it utilizes the available resources, or it does not need many other partners to be recruited. Neither does it demand large or customized changes in the operation of on-demand fleets. This opens up the opportunity for new business models focused on combined transport for people and freight that may be upscaled to other locations within the same transport system, or with the recruitment of other private partners who would provide the on-demand vehicles and fleet within the same city.

The success of the upscaling of this measure requires new forms of public-private collaboration, which was tested in MOVE21. New integrated services require public-private partnership agreements that demand agile protocols and data sharing clauses to allow for deployment, maintenance and adjustments in relation to services. It also would require new types of legal contracts and the revision of the procurement standards and practices (Ruohonen et al, p.14). Another aspect to consider when upscaling is that the measure is sensitive to local preconditions and the specific combination of participating actors, which are not used to cooperate. This aspect might require additional efforts to motivate for testing new things and harmonize among the partners. The users might also need to be convinced to use the broader spectrum of services. For local authorities this means setting up new forms of collaboration between traditional public transport operators, new mobility service providers, logistics operators and private sector real estate developers and good owners (ibid., p.15).

4.5 Conclusions from Hamburg

Table 3 Assessment overview for Hamburg

Measure	Transferability - Governance aspects		Upscaling potential - Governance aspects	
HAM/Holstenstrasse	Promising	Due to the conceptual openness and flexibility of the "hub", may be populated with more and relevant services that can be adapted to other contexts and different user groups	Promising	Due to the conceptual openness and flexibility of the "hub", may be populated with more and relevant services. There is a Memorandum of understanding between the city and the private sector. Some powerful actors, e.g., Deutsche Bahn, are onboard and see the potential for upscaling. May be a driving force
HAM/Kaltenkircher Platz	Intermediate	Conceptual openness and flexibility of a "hub" - attractive feature for transferability. Local legislation and regulation might be a challenge in other contexts	Promising	The same as above. May be connected to other hubs to create a local or regional network.
HAM/MOIA	Intermediate	Ownership, coordinating organisation, and local legislation and regulation may be a challenge	Promising	Possible upscaling through adding additional partners, operators of the public transport, could be made into a city-wide strategy

The measures got rather high scores on transferability of certain aspects, and are seen as promising solutions to be transferred, especially the hub-related concepts (Table 3), but scored lower on the

availability of governance and regulatory preconditions that would enable the implementation of these measures in other contexts.

In regard to upscaling, all the three measures, relevant for upscaling, are estimated to be promising solutions. In particular, the concept of the hubs has the potential. The City of Hamburg and Deutsche Bahn have developed a tender template for micro-depots, allowing municipalities or other actors to benefit from experiences in Hamburg. The local cargo bike manufacturer and courier company Tricargo uses the micro-depot and is looking to upscale the use of micro-depots to optimise their delivery structures. Through the expansion of the various sharing offers (different mobility solutions) the measure may be expanded and upscaled to other suburban areas with the goal of optimisation of the current mobility offer. The hub will be a starting point for upscaling of the measure across other municipalities and districts in the city of Hamburg.

The upscaling, however, may be impeded by the unavailability of the suitable physical space for the hub. Another challenge is the find the governing actor who will be responsible for the upscaling and finding the right partners and services that will populate the upscaled hub. Another important precondition for upscaling is to have the necessary regulations and agreements in place. The City of Hamburg has signed a memorandum of understanding with the private sector which states the essential agreed upon strategic solutions and actions for both parts to reach the sustainable development goals. Such agreements stimulate collaboration between the different actors and serve as an important cornerstone for further upscaling of the solution.

5 Gothenburg

This chapter provides, in separate subchapters, an overview of the development and content of the test sites in Gothenburg. It details the specific measures implemented, highlighting their unique features and the context in which they operate, to set the stage for understanding the practical applications of the MOVE21 project and the innovative solutions tested in these urban environments.

Thereafter, each measure's estimated transferability to other cities is analysed (builds on the perception of the LLs and the replicator cities, from workshops and from D7.2 respectively) and presented. Some measures are elaborated on in greater depth than the others following the chosen methodology and based on the data collected from the LLs.

Lastly, recommendations for upscaling of the different measures in are provided. The upscaling recommendations build on the reflections from the LL cities themselves that were collected during the workshops and interviews (see methodology section), complimented by analysis from the WP.

5.1 Mobility hotel in Nordstan

5.1.1 Overview of the measure

The mobility hotel in Nordstan is a zero-emission micro mobility hub in the Nordstan business and shopping centre in the city centre of Gothenburg. It has multiple functions: shared fleet of vehicles and bikes for service providers (window cleaners, electricians, cleaning companies, etc); mobility companies sharing space, providing services and sales; a battery swap for micro-mobility operators; an unmanned warehouse store for a technical trading company and cargo bike hub with consolidation of goods and last mile delivery and a co-working space.

The Mobility hotel in Nordstan was inaugurated in May 2024 and aims to:

- Facilitate the quiet and emission-free transport of goods and people in the inner city,
- Reduce motorised transport for deliveries, personal mobility, and service providers,
- Provide active and sustainable mobility services to promote clean and green travel behaviour,
- Facilitate creation of a cleaner, safer, and more sustainable environment in and around central city, and,
- Develop new business models with shared risks and rewards.

The Gothenburg LL has piloted a scalable concept, which in November 2024 has the following solutions and services implemented:

Front-end

- Public store with micromobility service and sales – serving both individual customers and businesses
- Battery swap for micromobility users – such as food delivering companies
- Cargo-bike hub - doing last mile deliveries by bike

Back-end

- A pool of micromobility vehicles offered to handymen and facility providers
- Unmanned warehouse store professional wholesaler open 24/7
- Co-work areas and shared facilities
- Back-end areas to consolidate and reloading goods for last mile deliveries

The Gothenburg LL has established a close cooperation with stakeholders within the test site Nordstan and this cooperation is planned to be sustained beyond the lifetime of the project. The Gothenburg LL developed a zero emission micromobility hub, conceptualized as a mobility hotel. A large number of partners are involved, also beyond the project consortium. The project partners involved include the City of Gothenburg, the Business Region Gothenburg and Volvo, and these collaborate with the property owners' association Nordstan samfällighet, which consists of five property owners. Seven actors have signed contracts and are collaborating within the mobility hotel operations and are users of the different services. The contracts that are signed, allow for multiple-year cooperation beyond the lifetime of the project. Furthermore, efforts are being made to further expand the cooperation to more users.

The operational business model consists of shared costs and risks for facilities, services already developed in collaboration with various stakeholders, as well as an active exploration of opportunities for new services and value propositions targeting both business to customers and business to business. The development of the Mobility Hotel in Nordstan continues to be a priority, supported by three dedicated groups. One group consists of the stakeholders participating in the mobility hotel to collaborate on new services, joint offers and operational issues. One communications group are collaborating on shared communications efforts, including study visits and packaging of offers. Finally, the strategy group consists of the founding partners and focuses on the long-term strategy and upscaling possibilities.

5.1.2 Transferability assessment from the Gothenburg LL point of view

Mobility hotel in Nordstan is a good example of the fact that consolidation, collaboration between the different private actors, and their co-location is possible. It is further an example of successful consolidation of services within the last mile delivery concept as well as a combination of both front-end and back-end services in the same concept. Co-location of services creates synergies and enhances opportunities for business, which is one of the attractive factors for the measure to be transferred elsewhere. The physical location in the city, accessibility and the space available are among the key preconditions for raising the attractiveness of the hub, and, consequently, the sustainability of the business models in place. These conditions are important to consider when transferring the measure to other contexts.

In terms of transferability, this solution may be seen as a possibility for any dense city centre. True sharing of costs, risks, space, customers and communication are key for this measure to be transferred to other contexts and locations. Well-functioning governance-related processes are one of the main preconditions for the successful transferability of this measure. Importantly, this type of solution needs to be approved and anchored in the local decision-making at least on the city level. For example, there needs to be a decision on when the concept should be used. Often new policy and regulations also need to be in place to strengthen the competitiveness of micromobility and logistics, to stimulate consolidation. For example, the public organisations might revise their framework agreements and public procurement processes to include incentives to promote desired transport and urban logistic solutions.

Local political commitment together with sustainable lasting business models (without subsidies) are important to make this type of consolidation work, creating a driving force among the potential partners. These governance related processes may take long time, several years, and need to be accounted for.

For transferability of this measure a coordinating organisation with mandate and decision-making power is needed. The coordinating organisation should be able to identify the key stakeholders to own and operationalize the measure, and to establish and support public-private collaboration.

5.1.3 Upscaling recommendations

This solution may be upscaled by either expanding the scope of services that are offered in the mobility hotel, or by merging with other solutions, e.g., co-freight of waste and cargo, creating a broader network of services and attracting a larger group of users and participating partners.

If the measure is to be upscaled into, for instance, a network of mobility hotels or similar, e.g., within a city strategy, there needs to be civil servants/units within the city administration who would get an assignment to lead such an initiative, make sure it gets implemented and followed through. Another possibility could be that the measure is operated through a well-functioning public-private collaboration structure with a clear mandate to do so.

Civil servants may also get an assignment from the city to lobby the establishment of the hub to other organisations, on local and regional level, which may contribute to transferability and upscaling on a regional level. Furthermore, it is crucial that public sector actors incorporate requirements for, and actively utilize, these types of services in their procurement processes and regulatory frameworks, e.g. electric cargo-bikes. This will provide the necessary framework for the service to be effectively implemented and scaled across different contexts.

The role of decision-making, priorities and leadership on a city level is key for such measures as the Mobility hotel Nordstan to be implemented and upscaled. There is an identified need for stronger will and more targeted processes within the city organisation that follows the linear decision-making process. For example, there needs to be a clear task and mandate given from the higher tier management towards operative civil servants. A clear owner and an overall operator of the hub would help to manage the partnership and facilitate collaboration between the partners. Finding an organisation to take on such a coordinating role, in a perceived just and sustainable way, is seen as one of the biggest challenges for upscaling of this solution.

5.2 Park and bike node Klippan/Jaegerdorff

5.2.1 Overview of the measure

Several different mobility services already existed at the test site Klippan/Jaegerdorff area but were perceived as fragmented. The measures implemented in the project focused on enhancing the area as a mobility hub, promoting existing mobility services and adding more services, with a focus on bicycles. The aim of these measures was to make the already existing shared mobility solutions more attractive, by using tools such as visualization, guidance and nudging. The Park and bike node contributes to enabling sustainable and emission-free travel behaviours while acknowledging future changes in the surrounding area, making use of the existing shared mobility solutions and collecting knowledge to develop mobility hubs.

The pilot includes improvements on bicycle infrastructure qualities in the test site area, micromobility hub area, shared bike station and wayfinding measure. At major stops, real-time signs display information about shared bikes, including availability and distance to the bikes. The Park and bike-pilot offers a reduced price for public rental bikes when parking at test site Klippan to further increase use of the shared bike system.

The node provides visualization, guidance and orientation for the users, and has been used by the LL to pilot minor interventions like mobility hub signs, wayfinding from the tram to the PT ferry stop, a new communications manner for carpooling and at major PT-stops, real-time signs display information about shared bikes, including availability and distance to the bikes. The node also offers a new public shared bike-station – based on the public's expressed need. There was already an existing station at the ferry stop but none at the tram stop, 200 meters down the road.

One important part of the work with test-site Klippan was a third-party integration of the shared bike system and car parking app. This has developed beyond MOVE21 and is now spread all over the city of Gothenburg. Developed throughout 2023, the system was ready for launch at the end of December 2023. The potential to replicate and scale this measure is significant, providing a valuable template for other cities across Europe looking to reduce car use and promote sustainable transport.

Since the end of December 2023, users of the Gothenburg parking app can access the shared bike system directly from the app. Before, public transport tickets were already accessible in the car parking app. This integration is an important step in promoting multimodal transport in the city. By using the same app for parking and accessing shared bikes, users can easily continue their journey using environmentally friendly transport options.

This integration aims to encourage traditional car drivers to try alternative modes of transport for the first time. By embedding sustainable transport options within the parking app, traditional car users are encouraged to make more sustainable travel choices and are given more seamless and convenient access to the sustainable services. A feasibility study for the integration of e-scooters was also conducted.

5.2.2 Transferability assessment from the replicator cities' point of view

This measure was seen as attractive to be transferred to other contexts in other cities because it entails integrating third-party parking apps and public bike sharing apps, potentially involving other shared micro-mobility operators, enhancing bicycle and shared micro mobility conditions in the test site area. Innovations focused on cyclists' needs were seen as attractive and relevant to be transferred elsewhere. In particular, the development of an app for managing and reserving parking spaces and services at the bicycle hub was seen as relevant and replicable.

One of the main preconditions for transferability of this measure to other cities was the fact that the regulatory and legislative aspects required for this measure were already in place in some replicator cities, e.g., a city e-platform for coordination of similar solutions, which made it easier to transfer the measure. Some cities have experience and capacity to coordinate activities and public-private entities involved. For example, the legislation/legal framework for conversion of parking places is in place in some cities.

For this third-party app integration to be transferred, public organisations, e.g., the city or public transport authorities in those instances where they are in charge of shared active modes of transport such as city bikes, need to be a driving force in such a transformation. Decisions about priorities are strategic decisions that need to be made on the city level, with political support and relevant budget allocations. Transferability of this measure depends on the political will of the city and its priorities. Good cooperation across organisations is an important precondition to the successful transfer of this solution to other settings. Cooperation adds much more value to the solutions, than when partners work in isolation.

5.2.2.1 Expected challenges

Two main challenges were expected in relation with transferability of this measure. First, a challenge in terms of legislative/regulatory frameworks on the level of agreements between the different actors. An agreement must be reached with the micromobility providers to ensure that they provide a reliable infrastructure. This is especially true if they are not yet active in the urban area where the measure is planned to be transferred to. For this, corresponding agreements for integration into local apps must be made and funding must be secured.

Another challenge is to establish a cooperation with micromobility providers, which is often on a voluntary basis and not necessarily regulated. Therefore, cities often cannot directly control that providers create an offer on the infrastructure provided by the city to encourage the population to switch to sustainable mobility. An existing technical gap, establishment of e-platforms, was among other identified challenges for some cities.

5.2.3 Upscaling recommendations

If the city is a driving force and a coordinating actor, a wider collaboration between the different administrations and companies could be stimulated, e.g., between the city environment administration and the parking company with possibilities to do more with the parking spaces in the city. To make this happen, there is a need for a common city strategy that would set the priorities and apply decision making instruments and procedures to facilitate public-private collaboration and transferability of the suggested solutions. The city should also have a clear plan on how many parking spots it should have available in the city and whether it uses reduction of parking space as a measure to decrease the modal share of private car use.

One practical recommendation for a potential upscaling from this test site to an entire network of mobility hubs would require a strategy or guidance document on the standardisation of signage and wayfinding tools. A consistent and user-friendly approach across all mobility hubs will enhance accessibility and reduce confusion for residents and visitors. Collaboration between municipal agencies and stakeholders is critical to achieving this consistency.

5.3 Cargo-waste co-freight Lindholmen

5.3.1 Overview of the measure

This measure provides improved freight services, augmenting the existing consolidated transport service for goods and waste to the business companies in the area of Lindholmen. It aims to reduce motorised traffic, emissions, and congestion by using the already consolidated cargo and waste-vehicles for additional purposes. The measure promotes reversed logistics (cargo/waste co-freight) at Lindholmen by extending the existing cargo/waste co-freight system, the so called Lindholmsleveransen, to make use of parcel boxes for both inbound and outbound deliveries.

The service is offered to the business tenants in the area of Lindholmen to receive and send letters and parcels through parcel boxes in the buildings, served by the same vehicles already handling the cargo/waste. This is to redirect more transport to the Lindholmsleveransen terminal, and from there incorporate the deliveries of the parcels with existing consolidated waste-freight circuit and in this way reducing the need for a multitude of companies and their vehicles entering the area of Lindholmen multiple times.

5.3.2 Transferability assessment

5.3.2.1 Cargo-waste co-freight transferability assessment from the replicator cities point of view

This measure was seen as transferable because it has the potential to expand the current cargo-waste co-freight system to include the utilization of parcel boxes for outgoing deliveries and aims to redirect more transportation to the Lindholmsleveransen terminal to minimize the necessity for individual transports among the stakeholders within the area. The idea of co-freight was planned to be transferred to Bologna but with different actors.

5.3.2.2 Cargo-waste co-freight Lindholmen transferability from the Gothenburg LL point of view

Transferability of this measure may be stimulated by finding similar physical locations with similar preconditions. In particular, the transfer of the measure to areas undergoing re-development/development may be of higher potential due to fewer other competing interests that pre-exist in the area. Another aspect that could be transferred is the merging of this solution with other micromobility and freight solutions. One could offer the same waste/recycling services and add them to the existing services. The solution may be transferred elsewhere by adding other services that may be relevant for the specific local conditions. The consortium of partners, together with public organisations, would need to write an agreement to collaborate over time, and articulate a common goal, e.g., to contribute to the green mobility plan.

5.3.3 Upscaling recommendations

This measure may be upscaled by adding other services or merging of this measure with other micro-mobility and freight solutions, such as, for example, Mobility hotel in Nordstan. One could offer the same waste/recycling services and add them to the existing services at the Mobility hotel thus expanding the scope, sharing the costs (lowering the costs for all) and making better use of space. The merging may also be done the other way around by adding services such as cargo bike last mile delivery or battery swap (from Mobility hotel Nordstan) to cargo-waste co-freight solution. The shared costs may be a stimulating factor for the stakeholders to participate in this solution.

5.4 Conclusions from Gothenburg

Table 4 Assessment overview for Gothenburg

Measure	Transferability - Governance aspects		Upscaling potential - Governance aspects	
GOT/Mobility hotel Nordstan	Promising	Commitment on the local level and leadership that facilitates Public-private partnerships is an important driving force, successful transferability in similar contexts (e.g., Oslo)	Intermediate	May be difficult due to market conditions, the city is not big enough for large upscaling. But the upscaling may be done through connection to other services and private sector partners, expanding the scope/network or connecting to other mobility solutions (e.g., Lindholmsleveransen)
GOT/Klippan	Promising	The possibility for third party app development is high if uses the existing digital infrastructure; needs clear ownership and coordination	Intermediate	The utility of the app is dependent on the upscaling while the other elements of the measure depend more on the centralized initiative of the coordinating organisation (the city)
GOT/Lindholmen	Intermediate	The measure is very dependent on the actor constellation, locally specific; dependent on the local regulations	Intermediate	There is a possibility to connect with other micro-mobility/logistic solutions, e.g., Mobility Hotel Nordstan. Otherwise, difficult to upscale on a city-wide basis, the large number of involved partners would complicate the public-private collaboration

Two of three measures scored high on the transferability and may be seen as indeed promising solutions to be implemented in other cities and contexts. The measure in Lindholmen scored medium on transferability as it is by design much more dependent on the constellation of the local participating actors and local regulations.

On upscaling all of the three measures scored medium, with a number of the foreseen difficulties related to governance, such as the role of the local coordinating organisation, complicated needs for partners to be involved, and local market conditions.



6 Oslo

This chapter provides, in separate subchapters, an overview of the development and content of the test sites in Oslo. It details the specific measures implemented, highlighting their unique features and the context in which they operate, to set the stage for understanding the practical applications of the MOVE21 project and the innovative solutions tested in these urban environments.

Thereafter, each measure's estimated transferability to other cities is analysed (builds on the perception of the LLs and the replicator cities, from workshops and from D7.2 respectively) and presented. Some measures are elaborated on in greater depth than the others following the chosen methodology and based on the data collected from the LLs, while some have not been explored due to lack of maturity.

Lastly, recommendations for upscaling of the different measures in are provided. The upscaling recommendations build on the reflections from the LL cities themselves that were collected during the workshops and interviews (see methodology section), complimented by analysis from the WP. Not all measures have been recommended for upscaling.

6.1 Integration of Micro-Mobility with Public Transport

6.1.1 Overview of the measure

The aim of the pilot was to integrate micro-mobility services with public transport offer provided by Ruter. Oslo City Bike services were integrated with Ruter's public transport offer, making the bike services visible, bookable and payable through Ruter's App for public transport route times and ticketing. This integration is designed to create a seamless journey for users, making public transport more accessible and user-friendly. This enables travellers to:

- Plan a trip from origin to destination combining the use of public transport and the shared bike service.
- Rent a bike at the appropriate location.
- Pay for the whole trip.

The Ruter App collects information about available bicycles and starts unlocking them using the REST API provided by Urban Sharing. All events related to the bicycle renting period are communicated asynchronously to the Ruter App using an API provided by Ruter. All incoming events cause updating of information about the bicycle rental in the Ruter App. When a bicycle is parked, the rental is automatically ended, and the rental is paid automatically without any actions from the user.

Urban Sharing used the opportunity to develop an innovative API. This API aims to seamlessly integrate micro-mobility offerings into Mobility as a Service (MaaS) applications, thereby enhancing the accessibility and efficiency of urban transportation systems. Key features of the API are:

- GBFS Integration: The API utilises the GBFS Feed to gather real-time data on micro-mobility services, ensuring accurate and up-to-date information for users.
- Seamless Integration: Enables easy integration of micro-mobility options into MaaS applications, promoting multimodal transportation solutions.
- Consistent User Experience: The micro-mobility provider maintains control of the user experience ensuring timely customer query handling and consistent branding.
- Data Privacy: Implements a bespoke ID system to protect user privacy while facilitating data exchange between systems.

- Operator Agnostic: Any micro-mobility operator that supports the GBFS feed can be easily integrated into a local or regional MaaS application.

The API provides access to the following services:

- Initiating vehicle trips using a vehicle ID, QR code or station ID.
- Trip status event stream - each time the status of a trip changes an event will be sent to your webhook.
- Trip state information
- Updating of an ongoing trip state - pause, resume, cancel, end.
- Vehicle damage reporting.

6.1.2 Transferability assessment from the Oslo LL point of view

This measure may be seen as a possible solution for linking different groups of actors in the mobility sector. However, it requires reliable business models or regulatory requirements to attract private actors to participate in such solution. As with other innovative solutions, there is often a lack of regulation of such collaboration although many cities in Europe are looking to change this. Favourable regulations for public transport and micromobility need to be in place to stimulate upscaling or transferability of this measure. This measure offers a marketing opportunity for operators, which may be used to attract them to participate.

6.1.3 Upscaling recommendations

The measure is well suited for upscaling in Oslo. The new micromobility regulation in Oslo, entering into force from 2025, will require e-scooter providers to share data with Ruter. The aim for this is to enable the integration of also e-scooter services into the public transport offer that currently includes city bikes. The API developed by Urban Sharing can be utilised also for this upscaling, although it will require work to adapt to handle more data feeds than the GBFS.

6.2 Emission-Free Goods Transport

6.2.1 Overview of the measure

The City of Oslo sees the need to further focus on urban logistics. There is a growing understanding in the City of Oslo that there is a need to have better policy tools and regulation for the urban logistics sector. Key aspects and priorities for urban logistics will be set forth in the Oslo SUMP (Green Mobility Plan) currently under development.

One pilot in the Oslo LL was called Emission Free Goods Transport. After failed dialogues with transport companies, the city decided to focus on shippers, inspired by the approach that has been successful in the CULT operation in Antwerp, Belgium. Discussions with several shippers were conducted, among them IKEA, Oda, Maske, and OneMed. A key challenge is to create an environment where shippers can collaborate efficiently and where they feel that key aspects related to performance, economy, and strategic integrity are taken care of. A contractual framework may be the solution.

During the discussions it became clear that, even in a pilot operation within MOVE21, it would be difficult for the shippers to bypass the already established contracts between the shippers and their current logistics providers. This has hindered any physical demonstrations in the Oslo LL.

Fornebu Hub is an existing hub for local distribution of goods already in operation established as part of the Norwegian project Varer i vestkorridoren. The hub is currently operated manually but as part of

MOVE21 Oslo LL activities the hub will be used to test MIXMOVE information systems for transport and cargo consolidation in an attempt to ensure digital solutions and increase interoperability between operators.

6.2.2 Transferability assessment

Due to the difficulties with any physical demonstrations of this measure within MOVE21 and Oslo LL, transferability has not been relevant for discussion in relation to this measure.

6.2.3 Upscaling recommendations

Upscaling has not been recommended for this measure.

6.3 Mobility-on-Demand for People and Freight

6.3.1 Overview of the measure

Ruter, the Oslo public transport operator, already operates a mobility-on-demand service for seniors (people above the age of 67). The service is provided using small buses. Shopping centres are favourite destination for the users of this service.

CC Vest is among the largest shopping centres in Oslo. The centre aims to increase the number of visitors, while, at the same time, reduce traffic.

This measure uses spare capacity in the buses transporting seniors to also transport goods. Stores in CC Vest offered customers home transport of purchased goods, to reduce the temptation for customers to use private cars to and from the centre.

The stores used a MIXMOVE web application to record information about the goods (and label it), receiver, and time for deliveries. A consolidation point was established at CC Vest, where goods from all stores were collected. Consolidation was made when customers had purchased goods in several stores so that one cargo item only were to be delivered to the same receiver at a given address. The MIXMOVE X-Dock solution was used to reconstruct and label the reconstructed cargo before booking the transport in an already existing on-demand service for passengers.

After consolidation, X-Dock sent booking information to the solution being used to organise the transport of passengers (TripVia) electronically. TripVia returned a confirmation (or cancellation). Integration of TripVia and the MIXMOVE solution was seamless, adapted to TripVia standard.

Customers received SMS when the transport was booked, when the transport started and when the goods had been delivered. The stores received the same information.

6.3.2 Transferability assessment from the replicator cities point of view

This measure was chosen by the replicator cities as the most attractive to transfer from the Oslo LL. The main service innovations developed by the Oslo LL in this concept were the home transport from stores in shopping centres using an on-demand solution for senior citizens, i.e., cargo-hitching using on-demand public transport.

To transfer this measure, one city was planning to pilot a combined transport of people and goods on a bus line of the public transport provider in the city. The general idea was that existing resources and capacities would be used more efficiently if people and goods travel in one shared vehicle, thereby also

reducing traffic emissions. It was assumed, that this combined transport would connect local private partners and could result in new business models which could create added value for the local inhabitants. Reasons for choosing this measure for transferability were driven by the high interest from local stakeholders in some cities, and the innovative aspects the measure offered, mainly the integration of public transport and logistics deliveries.

Depending on the local preconditions, transferability of this measure would require governance related efforts as this innovative solution may be a new topic for the municipality where it will be implemented. Due to these significant requirements the transferability potential of the measure was ranked by several cities as weak on several aspects. One of them regards the legislative and regulatory framework. As the regulatory and legislative context in replicator cities may be different from the one in Oslo, this solution may not be directly transferable to other cities' local context. Therefore, it is necessary for the replicator cities to build their own understanding of the local legislative/regulatory frameworks that come into play for this intervention. One could face this challenge by ensuring on-going outreach and discussions with the public transport provider, relevant authorities, shops, and customers to determine which regulatory, insurance and liability concerns are relevant to this concept in the local context and what, if any, legislative action might be necessary.

The following questions would need to be addressed before the transfer could happen: Which stakeholders are responsible for regulatory compliance and enforcement? How are these roles impacted in the pilot phases? Which liability concerns arise for which stakeholders? How are these addressed? At which levels do regulatory or liability conflicts arise: between stakeholders in the pilot operation? Between stakeholders and compliance/enforcement bodies? How are conflicts resolved? Which regulatory or liability framework solutions are developed in the piloting phases and are these scalable to broader implementation?

The operational framework is the second main challenge expected in the transferability of the measure. The operational context in replicator cities differs from Oslo in that the combination of goods with a fixed schedule public bus reduces the flexibility of the on-demand goods service. New operational concerns arise, e.g., how to incorporate goods pick-up/drop-off into the existing bus route (stations, service times) or how to structure orders into specific delivery windows. The measure's focus on the older people as a user group, who may have unique demands on operation, adds to the complexity. Furthermore, the replicator would need to ensure the involvement of the transport provider, supplier businesses and representatives of the recipients in the operational planning for the pilot concepts. A special attention should be paid to co-development and monitoring of operational goals and benchmarks with these stakeholders during the transfer of the measure.

6.3.3 Upscaling recommendations

Upscaling has not been recommended for this measure.

6.4 Mobility hub network Groruddalen

6.4.1 Overview of the measure

The mobility hub network in Groruddalen was developed by the City of Oslo in collaboration with Ruter, Bane NOR Eiendom, Voi, Ryde, Bolt, Bikely, Hyre and Getaround. The mobility hub network offers services at public transport sites, such as e-scooters, car sharing and parcel lockers. The modes vary at each location based on local needs.

An upscaling of the pilot is necessary to offer more comprehensive seamless options for citizens of Oslo. This involves expanding the network to multiple locations and offering a variety of transport and adjacent services that will enhance first- and last-mile connectivity and ensure a seamless travel experience.

The precondition to success is attractive locations with suitable density and distance between each of them. Higher density and multiple locations with variety of modes strengthens the whole transport network. Another precondition to success is to engage the correct stakeholders, to make sure land use policy and transport are interconnected.

Each location had visible signages and markings, available near public transport hubs or switches. Each location offers a combination of modes such as e-scooter, train, bus, car-sharing. Various experiences have been drawn from these locations with diversity of usage by location and services. However, some services might have been better positioned, and the pilot phase should have been longer notwithstanding the winter hiatus in Oslo.

Due to long distances and lack of public transport connections across the Grorud valley; e-scooters have been seen as a feeder to public transport in the outer city. Compared to the city centre, travel time per unit made by e-scooters were much higher in Grorud. Even though experience from the pilot shows that the younger population comprises most of the users, increased access to mobility hubs can be beneficial overall at the local level.

The aim with the mobility hub network is to provide more travel and transfer options for residents outside the city centre. In turn, the network can help achieve reductions in climate emissions and in the use of private cars by providing seamless public transport combined with last-mile options. The network concept was tested in three different locations in Groruddalen in 2023 and 2024, with discussions taking place of how to best upscale similar hubs in Oslo.

6.4.2 Transferability assessment

This solution provides some valuable insight that mobility hubs are an appropriate way to organize and structure mobility services that can augment traditional mass transit. At the same time, this measure also highlights the importance of economic incentives and viability to acquire the right locations, e.g., close to a public transport station, inside the city centre or outside, where the physical infrastructure is better suited for the purpose of the hub (location, visibility, accessibility).

For better transferability of this solution, several aspects must be taken into account. For example, a gradual phasing in of new services to allow the population to adapt and accept the new services. In Groruddalen, a neighbourhood resistance to micromobility was observed as geofence zones were initiated in agreements with the operators. These geofence zones often conflicted with the travel patterns of the residents in the area. Another potential difficulty to consider when transferring the solution to other contexts is that one needs to find the right combination of the regulatory and economic prerequisites. There should be clear incentives for private actors to take part in this initiative; it is not easy to attract and motivate organizations and agencies to collaborate; in some cases, property ownership makes it hard to find available spots and locations for mobility services and asks for more time to negotiate locations.

With more appropriate locations, the right infrastructure and more services in place and a clear land use plan, this solution can be seen as a way for the city to structure and consolidate shared mobility with public transport and other facilities in areas with more population density and economic activity.

6.4.3 Upscaling recommendations

The city administration took initiative to develop a network of mobility hubs outside the city center in the Grorud Valley. The overarching goal of the network has been to make it easier to choose sustainable transport modes as the natural first choice in areas that have less well-developed public transport offers compared to other parts of the city. The intent was to co-locate a variety of mobility services close to key public transport such as train, metro and bus stations.

The network relies on the collaboration of many actors such as micromobility and shared mobility service providers, the municipality, housing corporations and national government agencies. The collaboration started with the City of Oslo inviting key actors to an initial dialogue conference. The municipality also worked with landowners to access space for mobility hubs. The design and services offered at the different mobility hubs are a result of the private-public and public-public collaborations throughout the project.

For the upscaling of the measure, it is important that all the actors involved share the vision and want to explore and learn from establishing a mobility hub network to reduce greenhouse gas emissions and the use of private cars. The hubs in Grorud were also an opportunity for the mobility service providers to test the use of their services in the outer city which has been an unexplored area so far. The biggest perceived hindrance to public-private collaboration for developing a network of mobility hubs has been local micromobility regulations. However, the City of Oslo has adopted a new regulation that will alleviate these challenges and take into account the need for mobility offers in the outer parts of the city. This, together with a framework for how private and public actors can work together beyond the realm of procurement or concessions, can ensure success for the further deployment of mobility hubs across the city as a city-wide strategy (Ruohonen et al 2024, p.23). Local stakeholders in MOVE21 have also suggested that mobility hubs and the network approach should be a central part of the Oslo SUMP currently under development.

6.5 Kaia Mobility Hotel

6.5.1 Overview of the measure

About half of the vans that circulate in the city centre of Oslo deliver urban logistics services such as deliveries, collections, servicing and transport of equipment. There is great potential to transfer more of these trips to more sustainable modes, in particular bikes and cargo bikes. The Kaia Mobility Hotel will contribute to traffic and climate emissions reductions.

The Kaia Mobility Hotel was launched in September 2024 and is a collaboration between the City of Oslo, Mobility Solutions, Posten Bring, Wolt and Nordic FM Group. More businesses are invited to participate on an ongoing basis. The Kaia Mobility Hotel provides cargo bike leasing and storage, office space, a workshop and the leasing and renting of additional light electric vehicles. Plans include expanding services to offer a mini warehouse for electricians, equipment storage, small transshipments, and battery swapping. Additional amenities under discussion are dedicated repair days for Wolt drivers' bikes and a break room accessible outside office hours, complete with charging facilities for batteries. The purpose is to facilitate more bicycle-based transport in the centre of Oslo and especially in the area intended as a future zero emissions zone. Central to the collaboration is the question: how many van trips can we replace in the city centre through active facilitation through mobility hotels and other similar measures?

The solution can be a business model where private business partners and public stakeholders together gain mutual benefits. An important precondition to succeed can be financial support from authorities to help small businesses get a kick-start and build a solid business case. It is also important for companies to identify optimal locations to offer their services, enabling delivery and logistics companies to achieve more environmentally and climate-friendly urban logistics transport. In addition to direct financial support, identifying and securing central locations to establish mobility hotels is another challenge that cities can help solve. The city benefits from having emission free and smaller vehicles, especially in densely populated or built areas. The companies can improve their urban logistics flow with fewer legal violations such as parking fines and quicker, more reliable trips unaffected by congestion. An identified barrier to the adoption of cargo bikes has been their high maintenance need. This problem is solved in the mobility hotel with extensive repair and maintenance facilities and tailored programmes, such as cargo bike leasing with guarantees against prolonged downtime for users, as well as customization of bikes to fit company needs and specifications.

6.5.2 Transferability assessment from the Oslo LL point of view

As it was inspired by Mobility hotel Nordstan, the existence of Kaia is in and of itself evidence of the transferability of the concept. However, there are both similarities and differences in the two pilots which can provide valuable insights into cities looking to implement a mobility hotel. One commonality is capitalizing on unused space, though the type of space utilized for Kaia is quite different from Nordstan. Kaia was able to occupy a recently vacated mobility hub that was previously occupied by Ruter, Oslo's public transport agency. The area is centrally located and slated for re-development in 2030, and the area has several temporary structures that began as pilot projects and have since grown into city hubs supporting urban logistics.

The ability to take advantage of unused, or underused space and repurpose it for mobility hotels like Kaia or Nordstan is a critical factor for transferring the concept to another city. Space is at a premium in cities and securing access can be a significant challenge. Identifying relevant locations is of the utmost importance, combined with an understanding of the prerequisites for implementing the various services available.

The primary services available at Kaia at the time of this writing are related to leasing and service of 4-wheeled, weather protected cargo bikes as well as other light duty electric vehicles. Kaia is managed by Mobility Solutions, which is responsible for the operation of the mobility hotel and building up the available services. The other partners in the project are customers that lease bikes to use for their operations and the City of Oslo which is seeking to test and understand the potential of mobility hotels to transform city transport and the role that a local authority can play. The partners have signed a R&D contract and together they are responsible for finding additional customers, deepening existing partnerships and offering enough services to make KAIA sustainable from a financial perspective.

One of the key factors for success for Kaia will be the performance of the cargo bikes it leases. To include service as part of their leasing agreement, they are reliant that the bikes are able to handle daily use without major service problems or downtime. Too many operators have bought bikes without sufficient service agreements, resulting in that they are not utilized in the way intended. When considering the transferability of the concept, access to both robust cargo bikes that are fit for purpose for businesses, and the institutional knowledge to maintain and use them efficiently are significant factors that should be considered.

Context is another key factor that can influence the viability (and transferability) of a mobility hotel. Cities that have invested in bike infrastructure, restricted access to larger vehicles, or have subsidy

programmes for the purchase or lease of cargo bikes would likely also be well positioned to take advantage of the services offered by a mobility hotel.

6.5.3 Upscaling recommendations

Expanding the number of available services will be critical for Kaia's success and upscaling possibilities. Though still in the early phases at the time of this deliverable, services such as parking, charging, battery swapping, a break room and a mini-warehouse for tradesmen are either planned or in the process of being implemented. It will be important to identify what services are needed at what density. For example, a single dedicated workshop can handle many cargo bikes from a relatively large catchment area, but services such as a break room, or battery swapping might benefit from being more distributed through the city in smaller mobility hotels.

Not only does Kaia need to scale up the number of services available, but also the number of customers for existing services, especially leasing of cargo bikes and other electric vehicles. Kaia's long term success hinges on the partner's ability to attract customers and business partners. External factors will play a large role. While the City of Oslo is already investing in cycling infrastructure and implementing measures to reduce traffic, more targeted measures could further support the attractiveness of initiatives such as Kaia. For example, preferential treatment for cargo bikes in municipal tenders (as has been done with electric vans), or subsidizing leasing of cargo bikes would be beneficial for Kaia.

One challenge for Kaia is that the lease for its property is renewed on a six-month basis, which can lead to a degree of insecurity when considering significant investments in new services at the hub. A longer-term rental agreement could contribute to more stability. The City of Oslo sees that upscaling of Kaia and similar mobility hotels can work in strategic locations elsewhere in the city and with slightly different services. Locations in the northeast of the city center would for example be particularly suitable for consolidation of goods entering the city from bigger warehouses located in the northeast of the city. The city also sees that setting aside land use for such measures as mobility hotels is critical and sees that this is something that should be done as part of strategic land use and transport plans, including any regulation plans part of the municipal master plan.

6.6 Conclusions from Oslo

Table 5 Assessment overview for Oslo

Measure	Transferability - Governance aspects		Upscaling potential - Governance aspects	
OSL/Linking public transport and micromobility	Intermediate	Provides added value for users, straightforward, does not require additional (digital) infrastructure; the regulations regarding data sharing need to be figured out, might be hindered within the regulatory framework; competition between different micromobility providers	Intermediate	Potentially scalable on the city level; may be connected to other mobility solutions, e.g., mobility hubs and networks. Potential difficulties related to data sharing regulations, competing interests from micromobility providers
OSL/Mobility-on-demand for transport of people and freight	Intermediate	May provide a lot of added value for the citizens, but difficulties with local regulatory and legislative frameworks may be anticipated. Regulatory or liability conflicts may arise. Requires common operational goals among the partners	Challenging	Difficulties with legislative and regulatory frameworks on the city level. Quite many uncertainties around what is allowed and how such solution should be regulated. Demanding for private sector partners to adjust, and for public transport operators too.
OSL/Mobility hub network	Promising	The network structure is flexible, allows other partners and mobility services to be included, adapted and transferred to other contexts. New opportunities for business, new public-private collaborations. Difficulties may be related to local regulation and legislation in other contexts.	Promising	Public-private collaboration facilitates the upscaling. The legislative and regulatory frameworks have been adjusted, e.g., local micromobility regulations. The new regulation is on the way and will facilitate the upscaling of the measure on a city-wide level
OSL/KAIA mobility hotel	Promising	The concept is flexible and collaborative, which attracts partners to share space, risks, providing new business opportunities. Requires clear ownership and leadership from coordinating organisation (the city)	Promising	There is a possibility to connect with other micro-mobility/logistic solutions within the new city-wide strategy and new regulations for micromobility.

Two of the four measures score as promising on both transferability and upscaling potential which make them strong candidates to have an afterlife after the project's timeframe. These two measures are the Mobility hub network and KAIA mobility hotel. These measures both share the characteristics that enable transferability – they are flexible and adaptable in terms of services that may populate them, which may be tailored to the local needs and specificity of conditions. Another strong feature that facilitates transferability and upscaling is that they may be compatible with other mobility solutions and services within the same city or in other contexts with a potential to form a network of services or hubs.

The other two measures score lower on both transferability and upscaling primarily due to foreseen difficulties related to local regulatory and legislative frameworks operational in a city.

7 Conclusions

In this chapter, we synthesize the key findings, focusing on the potential for upscaling and transferability of the implemented solutions from a governance perspective. We explore the critical factors that influence the success of these initiatives within the LLs and beyond. Additionally, we reflect on the lessons learned and provide recommendations for ensuring the sustainability and continued impact of these innovative measures. This comprehensive analysis aims to guide future efforts in enhancing urban mobility and logistics systems.

7.1 Overview of the measures

Based on the analysis in the subchapters on transferability and upscaling, an overview has been compiled in table 6, below. This table aims not to provide any in-depth definitive assessments, but to give the reader a concise recap of all assessed measures. As previously mentioned, even a promising measure needs preparatory work and further analysis before being transferred to a new, unique, location.

Table 6 Brief overview of all assessed measures

Measure	Transferability - Governance	Upscaling potential - Governance
HAM/Holstenstrasse	Promising	Promising
HAM/Kaltenkircher Platz	Intermediate	Promising
HAM/MOIA	Intermediate	Promising
GOT/Mobility hotel Nordstan	Promising	Intermediate
GOT/Klippan	Promising	Intermediate
GOT/Lindholmen	Intermediate	Intermediate
OSL/Linking public transport and micromobility	Intermediate	Intermediate
OSL/Mobility-on-demand for transport of people and freight	Intermediate	Challenging
OSL/Mobility hub network	Promising	Promising
OSL/KAIA mobility hotel	Promising	Promising

7.2 Upscaling within the Living Labs

The MOVE21 project has demonstrated significant potential for upscaling within the LLs. The success of these initiatives hinges on addressing local needs and securing political support, which helps set priorities and create incentives for various stakeholders. This support is crucial for fostering new collaborations and innovative solutions.

Governance preconditions play a central role in upscaling efforts. These include process-oriented measures, knowledge management, learning initiatives, and collaboration frameworks. Additionally,

existing regulations and guidelines must be adaptable to accommodate new measures. The ability to navigate these governance aspects effectively can significantly enhance the scalability of solutions within the LLs.

7.3 Transferability beyond the Living Labs

The transferability of measures beyond the LLs depends on several key factors. Cities with established processes for public-private partnerships, innovation project management, and stakeholder engagement are better positioned to transfer and implement new solutions. These cities benefit from a foundation of trust and collaboration, which can streamline the adaptation and integration of new measures. Existing digital and physical infrastructure, such as transport apps and available space, can facilitate the integration of new measures. This infrastructure provides a ready-made platform for deploying innovative solutions, reducing the time and cost associated with building new systems from scratch.

A supportive regulatory framework is essential for managing new solutions, including policies that enable the transformation of parking spaces and other urban areas for innovative uses. Regulations that are flexible and forward-thinking can help overcome barriers to implementation and encourage experimentation with new approaches. An overarching political vision that sets clear priorities and stimulates collaboration is vital. This vision should be reflected in city development plans, green transition strategies, and zero-emission zones. Political leadership can drive the adoption of innovative solutions by setting ambitious goals and providing the necessary resources and support.

Offering potential partners new networks and business opportunities can make innovative solutions more attractive. By creating an ecosystem where businesses can thrive, cities can attract investment and foster a culture of innovation. This approach not only benefits the immediate project but also contributes to the long-term economic and social vitality of the city.

7.4 Reflections and lessons learned on upscaling and transferability

The MOVE21 project has highlighted several important lessons for upscaling and transferability. Understanding what is possible within the existing legal framework is crucial. Measures that require even minor changes to legislation or policy are more challenging to implement. Developing attractive and sustainable business models is essential for engaging private partners. Public-private collaboration is a key enabler for implementing new solutions. Clearly defining the ownership and responsibility for measures is critical. This includes identifying who will lead and manage the initiative. Ensuring that there are sufficient resources, both financial and infrastructural, is necessary for successful implementation. Measures must be tailored to the specific local context, including the constellation of actors, available space, and infrastructure.

Replication, transferring and upscaling is very dependent on the strategic decisions at the municipal level. Without such decisions it is difficult to find and attract partners to participate in measures, and questions of ownership risk to be unresolved and hinder productive collaboration in the long run. Ownership of is a recurring precondition that needs to be decided early in the process of implementation.

One reflection from the work on this deliverable is that it seems easier for the LL representatives to talk about transferability compared to upscaling. One possible explanation for this is that the exploration on transferability potential naturally centres around finding possibilities, while assessing upscaling potential can be too focussed on finding obstacles. Sometimes, the distance between policymakers and

practitioners in the cities has also proven to be too long, making it difficult to see opportunities that policymakers are looking for in terms of testing new policy and policy priorities. The framework of an international innovation project, such as MOVE21, can act to overcome this and find opportunities for both transfer and upscaling.

7.5 Beyond the project's lifetime

To ensure the sustainability and continued impact of the MOVE21 activities and pilots beyond the project's lifetime, several factors must be considered. Establishing a clear mandate and identifying a responsible owner or facilitator for each measure is crucial. Developing business models that are financially viable and attractive to stakeholders is essential for long-term success. Strong political support and clearly defined priorities are necessary to drive the implementation and scaling of innovative solutions. Anchoring measures within existing city development plans ensures alignment with broader urban strategies and goals. The role of key individuals, such as politicians, civil servants, and business owners, is significant. These individuals can inspire others and drive change. Civil servants with an entrepreneurial mindset can play a pivotal role in implementing and scaling innovative solutions.

Partnerships, particularly public-private collaborations, are vital for the long-term success and scalability of the MOVE21 measures. These partnerships can leverage the strengths and resources of both sectors, fostering innovation and ensuring that solutions are both practical and sustainable. Public-private partnerships can also facilitate the sharing of risks and rewards, making it easier to implement and scale new measures. By fostering strong, collaborative relationships, cities can create a supportive ecosystem that encourages continuous improvement and adaptation of mobility and logistics solutions.

By addressing these factors, cities can enhance their capacity to scale and transfer successful measures, contributing to more sustainable and efficient urban mobility and logistics systems.

8 References

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