FACT SHEETS FINAL SET AND RESULTS BROCHURE

Project deliverable D10.6

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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 Lab Cities 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 Lab Cities 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 Lab Cities 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, DB InfraGO
- **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

Measures, key exploitable results, fact sheets, infographics,

Executive Summary

This deliverable provides an overview of the measures implemented by the Living Lab Cities and Replicator Cities throughout the MOVE21 project, compiled in the form of harmonised and synthetic factsheets.

The cities have implemented a wide range of measures, including mobility hubs, combined transport for people and freight, API integrations for extending mobility offers and mobility hotels offering various services promoting sustainable mobility. The replications of measures under different conditions underscore that solutions have been validated by several parties. Different types of mobility hubs and hotels have been identified as a Key Exploitable Results (KERs) from the project. The Mobility Toolbox cluster of KERs directly supports MOVE21's main objective by providing a comprehensive resource on the topic. In addition, the project has identified key results to exploit that focus on policy implementation and enabling factors. The project disseminates results on supportive policies integration of freight logistics with passenger mobility, integrated planning on the local level, as well as on the TEN-T network level.

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1 List of abbreviations and acronyms

Acronym	Meaning
API	Application Programming Interface
GBFS	General Bikeshare Feed Specification
GTFS	General Transit Feed Specification
LL	Living Lab
LPT	Local Public Transport
LTZ	Limited Traffic Zone
MaaS	Mobility as a Service
MSPs	Mobility Service Providers
PTA	Public Transport Authorities
RSM	Roma Servizi per la Mobilità
SULP	Sustainable Urban Logistics Plan
SUMP	Sustainable Urban Mobility Plan
VHH	Verkehrsbetriebe Hamburg-Holstein (Mobility Operator Hamburg)
WP	Work Package
ZEVs	Zero-Emission Vehicles
ZEZ	Zero-Emission Zone
ZTL	Zona a Traffico Limitato

2 Purpose of the deliverable

The purpose of this deliverable is to provide a clear and concise compendium of the measures developed in MOVE21. These are collected in fact sheets produced during the project and they have been completed by the Living Lab Cities and Replicator Cities. They are presented in a standardised format under the supervision of WP10 and in coordination with WP6 and WP7. This deliverable also outlines fact sheets and infographics that will be produced during winter 2024/25 as part of the project.

The fact sheets act as a quick reference tool that simplifies complex information, making it easier for non-experts to understand the project. This is especially helpful when presenting the project to community members, government officials, or the media. These informative documents help external stakeholders to better understand the project's measures in a clear and consistent format.

2.1 Attainment of the objectives and explanation of deviations

The objectives of this deliverable have been partially achieved. It describes measures in the Living lab cities and Replicator Cities through fact sheets and includes the infographics produced. Furthermore, it gives an introduction to key exploitable results and recommendations from the project. These will be further elaborated in coming fact sheets and publications during winter 2024/25.

2.2 Intended audience

This deliverable is addressed to an external and both technical (mobility and urban planning experts) non-technical audience.

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

This deliverable is structured as follows: it starts with a short section recalling the MOVE21 Living Lab Cities and Replicator Cities and presenting the approach taken to collect and group the most relevant information on the measures into a harmonised template, completed by the Living Lab Cities and Replicator Cities under the guidance and support of WP6, WP7 and WP10. The next chapter presents fact sheets providing a detailed insight into these measures. Finally, the deliverable includes a chapter describing MOVE21's future efforts on producing fact sheets and recommendations. The deliverable relates to work that has taken place in WP4, WP6, WP7 and WP9.

3 Introduction

The MOVE21 project focuses on sustainable mobility solutions through a structured approach working with Living Lab Cities and Replicator Cities. The Living Lab cities Oslo, Gothenburg and Hamburg, act as real-world test beds where mobility and logistics solutions are developed and tested. In these labs, stakeholders from government, industry, academia and civil society work together to create practical solutions. One of the aims for the Living Labs is to evolve into self-sustaining Innovation Co-Creation Partnerships that continue to foster innovation, align policy objectives and strengthen the capacity of city governments to support sustainable mobility for people and freight also once the MOVE21 project is completed.

Alongside the Living Lab cities, the Replicator cities, Munich, Bologna and Rome, are involved from the start, helping to set up and test initiatives. This two-way replication process allows them to adapt and implement the solutions in their urban contexts, following a flexible framework. The aim is to refine and extend this framework to support more cities across Europe in adopting these mobility solutions.

This deliverable aims to provide a clear overview of the measures implemented within the project, presented through fact sheets completed by the Living Lab cities and Replicator cities under the supervision of WP10 and in coordination with WP6 and WP7. In addition, the deliverable will summarise the key results achieved in relation to these measures, ensuring that all actions are well documented and accessible, supporting the broader objective of facilitating the transfer and adoption of these solutions in other urban areas.

3.1 Fact Sheet Template

The template provided to the Living Labs and Replicator Cities was designed to collect detailed information on each measure implemented as part of the MOVE21 project. This template ensured that data was collected in a clear, structured and consistent way.

The template included the following sections:

- **Title of the measure:** A short and descriptive name of the measure implemented.
- **City:** The name of the city in which the intervention was implemented.
- **Photo:** A visual representation of the measure a visual.

The following sections capture the core details of the action:

- **Why**: Explanation of the motivation or problem that the action aims to address.
- **Description**: Description that provides an overview of the action and its objectives.
- **Solutions, systems and services implemented**: Information on the specific solutions, systems or services implemented as part of the action.
- **Main innovative aspects**: Explanation of the main innovative elements, focusing on social, business model, technological, service and governance aspects.
- **Stakeholders involved**: A list of all stakeholders, including their full names and categories (e.g. public transport authority, mobility provider, shipper, etc.).

In addition, the template includes fields for:

- **Replicated in**: Indicate if the measure has been or could be replicated in other cities.

- **Contact for more information**: Contact details for a representative of the city partner, including name, role and email address, to facilitate further communication.

Finally, it included sections with information on the MOVE21 project website and social media (LinkedIn, X) to ensure easy access to further project details.

These templates will be turned into infographics, which will also be produced in paper format and shared across the project's media channels. This document contains the first batch of infographics prepared for the Living Labs.

4 Measures implemented

4.1 Oslo

As part of MOVE21, Oslo aims to reduce emissions by developing innovative solutions that integrate the transport of people and goods. The Oslo Living Lab focuses on creating scalable measures that can be implemented in different locations, enabling the city to effectively demonstrate and evaluate solutions that support its climate goals of reducing traffic and emissions.

4.1.1 Mobility Hub Network

4.1.1.1 Why

The mobility hub network aims to provide more travel and transfer options for residents outside the city centre, thereby helping to reduce climate emissions and private car use. This is achieved by providing seamless public transport combined with last-mile options. The network concept has been tested in three locations in Groruddalen in 2023 and 2024, and discussions are ongoing on how best to expand similar hubs in Oslo.

4.1.1.2 Description of the measure

This network provides services at public transport locations, including e-scooters, car sharing and parcel lockers, with the modes available at each location tailored to local needs. Scaling up the pilot is essential to provide more comprehensive, seamless options for Oslo's citizens. This expansion will include extending the network to multiple locations and providing a variety of transport and related services, improving first and last-mile connectivity and ensuring a seamless travel experience.

4.1.1.3 Solutions, systems, services implemented

The success of the project depends on the selection of attractive locations with appropriate density and spacing. Higher densities and multiple locations offering a variety of modes strengthen the overall transport network. Each site had visible signage and markings, strategically placed near public transport hubs or transfer points. Each site offered a combination of modes, such as e-scooters, trains, buses and car sharing, with usage patterns varying by location and service.

However, some services could have been better positioned and the pilot would have benefited from a longer duration, despite the winter break in Oslo. In the Grorud Valley, where long distances and limited public transport connections are common, e-scooters have effectively served as feeders to public transport in the suburbs. Compared to the city centre, e-scooter travel time per unit was significantly higher in Grorud. While the pilot showed that the younger population was the main user, it is expected that the wider local community will benefit from increased access to mobility hubs.

4.1.1.4 Main innovative aspects

Social, business models, technological, service, governance

4.1.1.5 Involved Stakeholders

The mobility hub network was developed by the City of Oslo in collaboration with Oslo's PTA, Ruter, Bane NOR Eiendom, Voi, Ryde, Bolt, Bikely, Hyre, and Getaround.

4.1.2 Kaia Mobility Hotel

4.1.2.1 Why

Oslo aims to reduce traffic and climate emissions in the centre of Oslo by shifting a significant proportion of the city's logistics trips, currently made by vans for delivery, collection, service and equipment transport, to more sustainable modes of transport, in particular bicycles and cargo bikes. The Kaia Mobility Hotel will support this transition and contribute to these reductions.

4.1.2.2 Description of the measure

The Mobility Hotel provides storage, small-scale handling, charging and battery changing, rest facilities and workshop services for repair and maintenance of bicycles and more. The aim is to promote bicycle-based transport in the centre of Oslo, especially in the area designated as a future potential zero-emission zone. A key focus of the collaboration is to explore how many car trips in the city centre can be replaced by active facilitation through mobility hotels and similar initiatives.

Figure 1 Kaia Mobility Hotel

4.1.2.3 Solutions, systems, services implemented

The solution involves a business model where private business partners and public stakeholders work together for mutual benefit. A critical success factor is financial support from public authorities to help small companies get started and build a solid business case. Start-ups also need to find the best locations to offer their services, so that delivery and logistics companies can achieve more environmentally and climate-friendly urban logistics transport. The city benefits from zero-emission, smaller vehicles, especially in densely populated or built-up areas. Businesses can improve their urban logistics flow with fewer infringements, such as parking fines, and faster journeys unaffected by congestion. An identified barrier to the uptake of cargo bikes is their high maintenance requirements, which the Mobility Hotel addresses through extensive repair and maintenance facilities and programme, and customised vehicles according to needs.

4.1.2.4 Main innovative aspects

Social, business models, technological, service, governance.

4.1.2.5 Involved Stakeholders

The Kaia Mobility Hotel is a collaboration between the City of Oslo, Mobility Solutions AS, Posten/Bring, Wolt and Nordic FM Group. More businesses are invited to participate on an ongoing basis.

4.1.2.6 Replication

This measure is replicating the Mobility hotel Nordstan implemented in Gothenburg.

4.1.2.7 Key Exploitable Result

This measure is identified as a key exploitable result.

4.1.3 Mobility-on-Demand for People and Freight

4.1.3.1 Why

One objective of MOVE21 is to reduce traffic by optimising the use of vehicles. One approach is to use the spare capacity of vehicles already carrying people to carry goods.

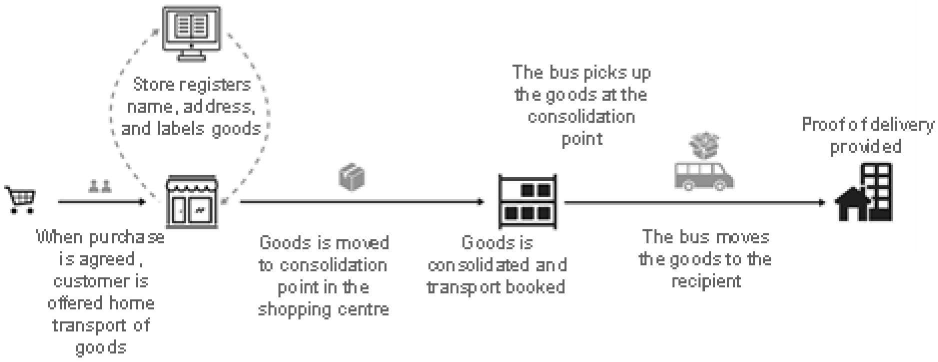

Figure 2 Mobility-on-Demand for People and Freight

4.1.3.2 Description of the measure

Selected shops in the CC Vest shopping centre were offered the opportunity to have goods delivered to their customers' homes. Ruter, which already offered a mobility-on-demand service for seniors, used this service for the transport. As CC Vest is a popular destination for shoppers who most often arrive by car, this service was well suited to test if more people would leave their car at home when going shopping in the suburbs of Oslo. CC Vest is also one of the more popular start and end destinations for Ruter’s on-demand-transport service that was used for the purpose. After customers made their purchases, the stores recorded the necessary information, labelled the goods and arranged for them to be picked up and taken to a local consolidation point. There, the load was restructured and transport booked. The goods were then delivered to their destinations, with status updates and proof of delivery.

4.1.3.3 Solutions, systems, services implemented

The stores used the MIXMOVE web application to record details of goods, recipients and delivery times. At the consolidation point, the MIXMOVE solution was used to reconstruct and label the load before booking the transport. Transport bookings were made using the TripVia solution, which was already used to organise passenger transport. The integration between TripVia and the MIXMOVE solution was seamless, with adjustments made to meet TripVia standards.

4.1.3.4 Main innovative aspects

The innovation lies in the combination of passenger and freight transport in the same on-demand vehicles and the integration of logistics management information systems with those used to manage passenger transport.

4.1.3.5 Involved Stakeholders

The stakeholders involved in the project are the shopping centre management and the shops at CC Vest Shopping Centre in Oslo, the shops' customers, MIXMOVE and Ruter.

4.1.3.6 Replication

This measure is being replicated in Hamburg.

4.1.3.7 Contact

MIXMOVE, Jan Pedersen, Founder, Board Member and R&D Manager of MIXMOVE, jan.pedersen@mixmove.io

4.1.4 Integrating Micromobility with Public Transport

4.1.4.1 Why

Provide a seamless, compliant and universal solution for Mobility Service Providers (MSPs) and public or private Mobility as a Service (MaaS) applications to integrate offerings without transferring personally identifiable information (PII).

4.1.4.2 Description of the measure

The Micromobility MaaS API, developed by Urban Sharing, provides a specification that enables MaaS providers to seamlessly integrate MSP offerings into their solutions while maintaining the original visual identity and customer experience. By building on existing data feeds such as GBFS, it supports more efficient and cost-effective integration and provides interoperability by allowing the data feed to be swapped with alternatives such as GTFS.

4.1.4.3 Solutions, systems, services implemented

The API was developed and implemented to integrate Oslo Bysykkel, Oslo's public bike sharing system, into Ruter's MaaS application. This integration allows Ruter app users to view, book, pay for and ride Oslo Bysykkel bikes directly within the app, facilitating seamless multimodal journeys.

4.1.4.4 Main innovative aspects

Technological innovation by using existing data feeds without PII, and business model innovation that enables integration without relying on traditional margin-based models.

4.1.4.5 Involved Stakeholders

The project involves a number of stakeholders, with Urban Sharing as the technology partner, Ruter as the public transport authority and Urban Infrastructure Partner, the operator of the Oslo Bysykkel system, as the mobility provider. Together, they enable the seamless integration of bikesharing services within the MaaS application, supporting a streamlined, multimodal travel experience for users.

4.1.4.6 Replication

This measure is being replicated in Munich.

4.1.4.7 Key Exploitable Result

This measure is identified as a key exploitable result for the integration of transport modes. The Application Programming Interface (API) will enable improved mobility services for end users. The API is open-source and accessible to all.

4.1.4.8 Contact

Urban Sharing: Tom Nutley, Chief Revenue Officer, tom@urbansharing.com

4.2 Gothenburg

The Gothenburg Living Lab acts as a collaborative platform, bringing together different stakeholders to address urban mobility challenges through innovative approaches. Through a series of workshops and meetings, partners discuss the specific needs and possible solutions in different test sites across the city. The aim is to foster co-creation, identify local issues and explore tailored solutions that improve urban life and promote sustainable transport practices. This collaborative effort aims to ensure that innovations are well adapted to the local context, ultimately contributing to a more efficient and liveable urban environment.

4.2.1 Park and Bike Node Klippan

4.2.1.1 Why

The aim of the measure is to enable sustainable and zero-emission travel behaviour while anticipating future changes in the environment. It aims to make use of existing shared mobility solutions and gather knowledge for the further development of mobility hubs.

4.2.1.2 Description of the measure

The measure involves the further development of a test site where several mobility services were already in place but were perceived as fragmented. The focus was on enhancing the area as a mobility hub by promoting existing mobility services and adding more, with a focus on bicycles. The aim was to make the existing shared mobility solutions more attractive through tools such as visualisation, guidance and nudging.

Figure 3 Shared bike user © Patrik Olsson

4.2.1.3 Solutions, systems, services implemented

The measure implemented several solutions, systems and services to improve micromobility and integration with public transport. A micromobility hub area was created by transforming car parking spaces into a dedicated micromobility space, complete with information about the various services available in the area. Visualisation, guidance and orientation were improved through smaller interventions such as mobility hub signage, wayfinding from the tram to the public transport ferry stop, and new communication strategies for carpooling. Real-time information on shared bikes, including availability and distance, was displayed at major public transport stops. In response to public demand, a new public bike rental station was installed near the tram stop, complementing the existing station at the ferry stop just 200 metres away. In addition, the shared bike rental system and e-scooters were integrated into the public transport app, allowing users to plan and purchase multimodal journeys with special offers at reduced prices.

4.2.1.4 Main innovative aspects

The measure introduces several innovative aspects across social and service dimensions. Social innovations include improved perceptions of safety through easier orientation for cyclists, an increase in multimodal provision and a strengthening of place identity, which has a positive impact on community cohesion. In terms of service innovation, the measure facilitates easier orientation between different modes of transport, making it more seamless for users to navigate the available options.

4.2.1.5 Involved Stakeholders

Stakeholders involved in the measure include Göteborgs Stads Parkeringsaktiebolag, the City of Gothenburg, carpooling companies, micromobility companies and citizens.

4.2.1.6 Replication

This measure is being replicated in Rome.

4.2.1.7 Contact

City of Gothenburg, Sara Mellberg, Test site leader, Sara.mellberg@stadsmljo.goteborg.se

4.2.2 Park and bike pilot

4.2.2.1 Why

The aim is to enable sustainable and zero-emission travel, using existing shared mobility solutions and encouraging the most car-dependent citizens to try more sustainable modes of transport.

4.2.2.2 Description of the measure

User surveys indicated that shared bike users were primarily switching from relatively sustainable modes of transport. To target the most car-dependent individuals, car parking data was analysed to identify frequent central city parkers likely to pass through the test site. These individuals were offered the opportunity to park at the Klippan site and use public hire bikes free of charge for one month.

4.2.2.3 Solutions, systems, services implemented

Offering frequent central city parkers, the option to park at the Klippan site and use shared bikes for free for their last-mile journeys.

4.2.2.4 Main innovative aspects

Socially, the measure targets the most car-dependent people through a targeted pilot. In terms of business model, it proposes a combined multimodal charging structure that integrates parking and cycling into a single payment model.

Figure 4 Shared bike user II © Patrik Olsson

4.2.2.5 Involved Stakeholders

The Stakeholders involved are Göteborgs Stads Parkeringsaktiebolag, the City of Gothenburg, as well as the citizens.

4.2.2.6 Contact

City of Gothenburg

Sara Mellberg, Test Site Lead
Sara.mellberg@stadsmljo.goteborg.se

4.2.3 Third party integration shared bike system and car parking app

4.2.3.1 Why

The aim of this measure is to reduce car use and promote sustainable transport by encouraging innovation. Further, it aims to improve access to sustainable mobility services and to increase the use of active and environmentally friendly modes of transport. By making the transition to multimodal transport more seamless and convenient, the measure encourages traditional car users to switch to more sustainable options. Ultimately, it promotes a shift towards sustainable and active modes of transport.

4.2.3.2 Description of the measure

Since the end of December 2023, users of Gothenburg's parking app have been able to access the city's shared bike system directly from the app. Previously, public transport options were also integrated into the parking app, making this new addition another important step in promoting multi-modal transport in the city.

By allowing users to manage both parking and access to shared bikes through a single platform, this integration makes the transition to greener transport options easier. In particular, the initiative aims to encourage traditional car drivers to explore alternative modes of transport and promote greener travel habits.

Developed throughout 2023 and launched at the end of December, the system has the potential for significant replication and scalability, providing a model for other cities across Europe looking to reduce car use and promote sustainable transport. Initially tested in Klippan, the system has now been rolled out citywide in Gothenburg.

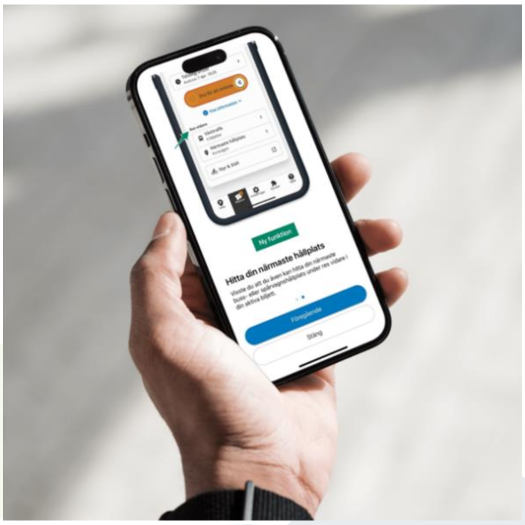

Figure 5 Third party integration shared bike system and car parking app

4.2.3.3 Solutions, systems, services implemented

A feasibility study was published on the integration of the parking app with the public bike-sharing system. The integration was then implemented, making both parking services and public bike sharing accessible through a single app.

4.2.3.4 Main innovative aspects

The main innovation of this measure is threefold. Socially, it increases the availability and convenience of multimodal transport, encouraging users to combine different modes of transport. Technologically, it introduces a one-stop e-shop that seamlessly integrates parking and bike-sharing services into a single platform. From a service perspective, this integration significantly improves the user experience by simplifying access to multiple transport options and facilitating navigation between different modes.

4.2.3.5 Involved Stakeholders:

The stakeholders involved are the Gothenburg City Parking Authority, the City of Gothenburg as well as the operators Nextbike and Tier.

4.2.3.6 Contact

City of Gothenburg, Sara Mellberg, Test Site Leader, Sara.mellberg@stadsmljo.goteborg.se

4.2.4 Cargo-waste co-freight Lindholmen

4.2.4.1 Why

The aim of the measure is to provide improved services to businesses in the Lindholmen area by increasing the level of freight handling. The intention is to reduce motorised traffic, emissions and congestion by using existing freight and waste vehicles for additional purposes.

4.2.4.2 Description of the measure

The measure extends the existing freight/waste co-freight system, Lindholmsleveransen, to include parcel boxes for both incoming and outgoing deliveries. Business tenants in the area can receive and send letters and parcels through these parcel boxes, which are serviced by the same vehicles that currently handle freight and waste.

Figure 6 Parcel boxes in the cargo-waste co-freight system © Peter Nilsson

4.2.4.3 Solutions, systems, services implemented

The measure expands the existing freight-waste co-freight solution to include parcel boxes for both inbound and outbound deliveries. The aim is to divert more traffic to the Lindholmsleveransen terminal and to integrate parcel deliveries into the existing consolidated waste freight circuit.

4.2.4.4 Main innovative aspects

The main innovative aspect of this measure comprises several key elements. Socially, it reduces the number of transports in the area, making it more liveable. From a service perspective, it integrates a new parcel delivery service into the existing consolidation scheme, optimising the use of the existing logistics infrastructure. From a governance viewpoint, it establishes a formalised collaboration between various stakeholders, such as operators, tenants, landlords and logistics companies, who do not normally work together to support and finance the service.

4.2.4.5 Involved Stakeholders:

Stakeholders include the City of Gothenburg, Renova Miljö (a waste management company), property owners, tenants/end users.

4.2.4.6 Replication

This measure is replicated in Bologna.

4.2.4.7 Contact

Renova Miljö, Patrik Ahlström, Test Site Leader, Patrik.ahlstrom@renova.se

4.2.5 Mobility hotel Nordstan

4.2.5.1 Why

The aim is to facilitate the quiet and emission-free movement of goods and people in the city centre, to reduce motorised transport for deliveries, personal mobility and service providers, and to provide active and sustainable mobility services to encourage clean travel behaviour. In addition, it aims to create a cleaner, safer and more sustainable environment in and around the city centre, pilot a scalable approach and develop new business models with shared risks and rewards.

4.2.5.2 Description of the measure

The measure involves the creation of a zero-emission mobility hotel in Nordstan with multiple functions: a shared fleet of vehicles and bikes for service providers (such as window cleaners, electricians and cleaning companies); mobility companies sharing space for services and sales; a battery swap station for micro-mobility operators; an unmanned warehouse for a technical trading company; a cargo bike hub for consolidation of goods and last mile delivery; and a co-working space.

4.2.5.3 Solutions, systems, services implemented

On the front end, there is a public shop offering micromobility services and sales to both individuals and businesses, a battery swapping service for micromobility users such as food delivery companies, and a cargo bike hub focused on last-mile delivery by bike. On the back end, the measure provides a pool of micromobility vehicles for tradespeople and facility providers, an unmanned 24/7 warehouse from a professional wholesaler, co-working areas and shared facilities, and back-end areas for consolidating and reloading goods for last-mile deliveries.

Figure 7 Loading of parcel from the warehouse to cargo bike for last-mile delivery © Philip Liljenberg

4.2.5.4 Main innovative aspects

Social innovation is achieved by reducing traffic in the area, making it more liveable and improving the working environment for local service providers through active mobility. Business model innovation includes the creation of a shared space model with clear cost allocations and responsibilities between parties, and a new use of central real estate that shares risk and costs, effectively overcoming the barriers of public-private partnerships. Service innovation is the seamless combination of different services into a single user experience. Governance innovation focuses on overcoming barriers to public-private partnerships, streamlining public procurement processes to support innovative mobility and logistics solutions, and exploring ways in which the municipality can act as an incubator for such initiatives.

Figure 8 User of shared bike for service providers © Christina Petersson

4.2.5.5 Involved Stakeholders

The founding partners are the City of Gothenburg, Business Region Gothenburg and the Nordstan Real Estate Association. Within the Mobility Hotel, the participating actors are Pling, BikeFixx, Urbancorner, Ahlsell, GoCiklo and the City of Gothenburg.

4.2.5.6 Replication

This measure is replicated in Oslo.

4.2.5.7 Key Exploitable Result

This measure is identified as a key exploitable result in the project.

4.2.5.8 Contact

Business Region Gothenburg, Anastazia Kronberg, Test Site Leader, Anastazia.kronberg@businessregion.se

4.3 Hamburg

The Hamburg Living Lab, located in the district of Altona, focuses on the implementation of mixed-use micro-hubs designed for both passengers and freight, promoting innovative transport strategies. By exploring the diverse urban fabric within Altona, the initiative aims to identify optimal locations and develop integrated solutions that meet the mobility needs of the community while promoting sustainable practices.

4.3.1 Neighbourhood Hub Holstenstrasse

4.3.1.1 Why

The aim is to reduce traffic and emissions from freight transport while offering climate-friendly solutions. It also aims to provide support and advice to residents. In addition, the measure addresses the existing shortage of space with a multi-functional concept that can be adapted and scaled for other neighbourhoods in Hamburg and beyond.

4.3.1.2 Description of the measure

The Neighbourhood hub Holstenstrasse addresses the current shortage of space through its mixed-use concept. Sustainable solutions for transporting goods, such as the use of electric cargo bikes, are being developed. In addition, socio-cultural activities and donations have created a new focal point that is constantly evolving in collaboration with social initiatives and residents.

4.3.1.3 Solutions, systems, services implemented

A previously empty building has been transformed into a multi-functional hub for both commercial and charitable purposes. The space now serves as a logistics centre for reloading parcels and goods, helping to reduce truck traffic by facilitating deliveries and collections with electric cargo bikes. In addition, a social service and advice kiosk has been created to provide advice, support services, food and supplies such as hygiene articles. The multi-functional use of the existing building optimises the use of resources, while the multi-user logistics centre reduces the overall space required for urban logistics operations.

4.3.1.4 Main innovative aspects

The key innovative aspects span social, business model, technological, service and governance dimensions. By integrating last-mile logistics and social services under one roof, the hub promotes a more liveable and sustainable neighbourhood, combining essential services with environmentally friendly logistics solutions.

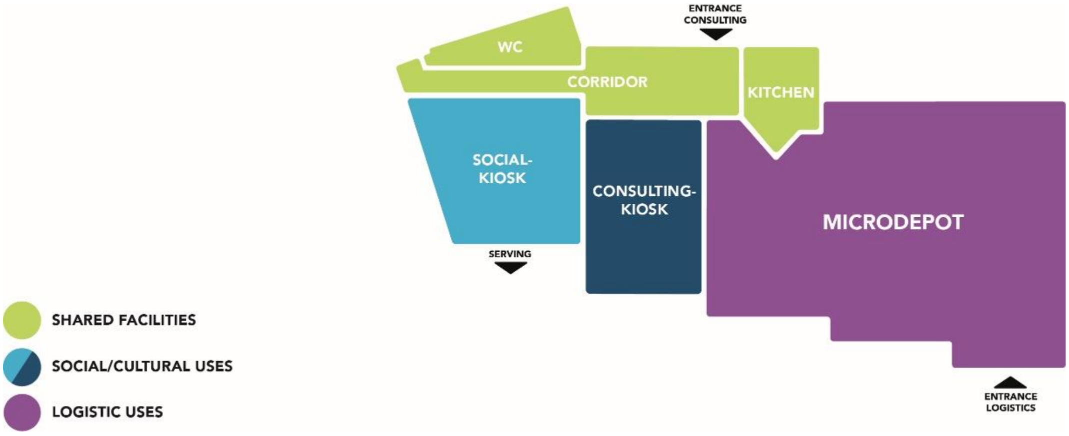

Figure 9 Neighbourhood Hub Holstenstrasse © District of Altona

Figure 10 Neighbourhood Hub Holstenstrasse II © District of Altona

4.3.1.5 Involved Stakeholders

The stakeholders involved come from different sectors. In the social sector, the DeinTopf e.V. association and the Karin and Walter Blüchert Memorial Foundation are involved. From the mobility sector, Deutsche Bahn InfraGO AG is involved, while logistics companies such as Hermes, GLS and CityLog play a key role. From the public sector, the district of Altona, the Ministry of Economics and Innovation, the Senate Chancellery and HafenCity University are represented. In addition, SAGA a municipal housing cooperative as landlord, and residents and further social initiatives are involved.

4.3.1.6 Key Exploitable Result

This measure is identified as a key exploitable result. This concept can be further developed, as demonstrated in Hamburg, where the mobility hub model has been extended to include innovative elements, in this case, a focus on social integration.

4.3.1.7 Contact

District of Altona, MOVE21@altona.hamburg.de
DB InfraGO AG, Jan Kruska, Jan.J.Kruska@deutschebahn.com

4.3.2 Neighbourhood Hub Kaltenkircher Platz

4.3.2.1 Why

At the multifunctional neighbourhood hub at Kaltenkircher Platz, a previously single-use car park has been transformed to provide improved sustainable mobility solutions for residents and commuters. In addition, a new modular logistics micro-depot system was introduced to reduce emissions and traffic associated with last-mile deliveries in the neighbourhood.

4.3.2.2 Description of the measure

At Kaltenkircher Platz, the micro-depot concept is integrated with the mobility hub concept. Existing infrastructure that supports personal mobility is also used for the logistics of the micro-depot. By improving the combination of different mobility options, the hub allows for better transitions between sustainable modes of transport.

The modular micro-depot acts as a central location, receiving goods through established logistics networks and distributing them over the last logistical mile using zero-emission cargo bikes. New mobility services at the hub include a car-sharing station, a micromobility parking zone for e-scooters, sheltered and temporary bike racks, and improved pathways that better connect to the neighbourhood and a bus stop at the test site. These are rounded off by an info-pole that informs the people about the new mobility offers and gives additional background of the concept of the hub. These improvements make it easier and more attractive for people to choose active and sustainable mobility options.

In addition, a new model recycling station has been introduced at the site to collect recyclable and reusable goods, highlighting the flexibility of the multi-functional concept to incorporate additional models and services.

Figure 11 Neighbourhood Hub Kaltenkircher Platz © District of Altona

Figure 12 Neighbourhood Hub Kaltenkircher Platz II © District of Altona

Figure 13 Neighbourhood Hub Kaltenkircher Platz III © District of Altona

4.3.2.3 Solutions, systems, services implemented

The individual modules of the micro depot are constructed from lightweight containers designed to fit into standard parking spaces. Although primarily designed for logistics purposes, the system is highly adaptable to other uses. It can be used for services such as a micro-mobility charging station, a bicycle station or even to house intelligent locker systems.

With the opening and improved accessibility of the intersection via the "Kaltenkircher Platz" bus stop, the previously single-use open space has been repurposed to support additional mobility and logistics services. This enhancement strengthens both local and wider mobility options.

The bicycle parking facilities at Kaltenkircher Platz, together with shared mobility services (such as car sharing and e-scooters), improve access to public transport and support environmentally friendly mobility. There are also links to other possible services such as recycling collections, pop-up city bike stations and electric charging for commercial vehicles.

4.3.2.4 Main innovative aspects

The main innovative aspects include the adaptable micro-depot system, designed for use in public open spaces. This new approach creates multifunctional spaces that accommodate both the mobility of people and goods in urban areas. Additionally, the open concept allows for further uses beyond logistics and mobility, offering flexibility to integrate additional services as needed.

4.3.2.5 Involved Stakeholders

Stakeholders include a range of public, mobility, logistics and recycling agencies. Public stakeholders include the District of Altona, the Ministry of Economic and Innovation Affairs and the Senate Chancellery. In the mobility sector, the key players are Hochbahn Hamburg, HVV and the Ministry of Transport and Mobility Transition. On the logistics side, Tricargo and Deutsche Bahn InfraGO AG are involved. In addition, Stadtreinigung Hamburg is responsible for recycling.

4.3.2.6 Key Exploitable Result

This measure is identified as a key exploitable result in the project.

4.3.2.7 Contact

District of Altona, MOVE21@altona.hamburg.de
DB InfraGO AG, Jan Kruska, Jan.J.Kruska@deutschebahn.com

4.3.3 Combined Transport - Rissen bringt's

4.3.3.1 Why

This service aims to test the simultaneous transport of passengers and goods by bus. The aim is to make more efficient use of resources and capacity, reduce climate and transport pollution, promote social participation and inclusion, and connect local stakeholders.

Figure 14 Combined Transport 'Rissen bringt's I © VHH Mobility

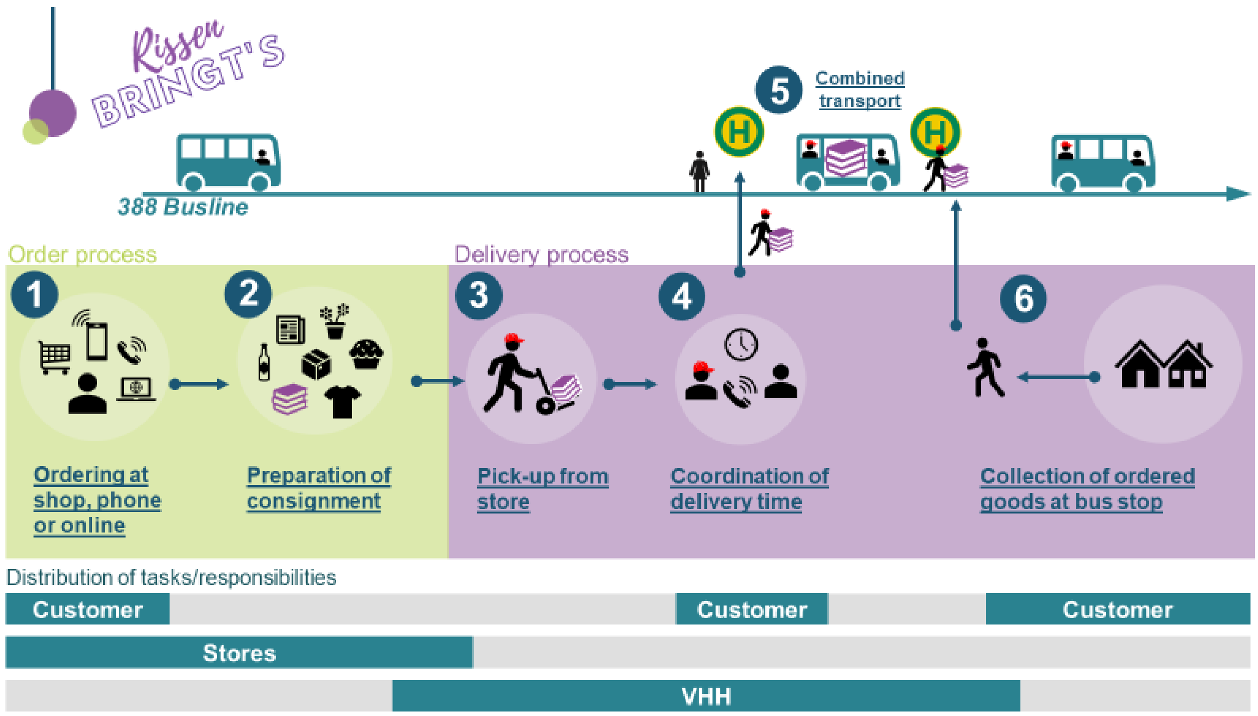

Figure 15 Combined Transport 'Rissen bringt's II © District of Altona

4.3.3.2 Description of the measure

Interested customers could select goods in-store or place orders by phone or e-mail if the store offers this option. Payment is made on the spot or by invoice. During the purchase process, shoppers provide their phone number for communication during delivery. Once the purchase has been completed, the goods were packed by the store. The store then notified VHH Verkehrsbetriebe Hamburg-Holstein

(VHH) – a public transport company - who collected the items, sorted them and coordinated the time of collection at the customer's preferred stop. The staff also handed over the order at the stop.

4.3.3.3 Solutions, systems, services implemented

The main objective of the pilot project was to reduce traffic and CO_2 emissions by using public transport for the simultaneous transport of people and goods. Specific objectives included making more efficient use of resources and capacity, promoting social participation and inclusion, and fostering links between local stakeholders. The range of goods offered for delivery included books, bakery products, limited groceries, clothing, shoe repairs, locksmith services and tailoring.

While the service was open to all citizens, it 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.

4.3.3.4 Main innovative aspects

In the West of Hamburg, in the city district Rissen, the 'Rissen bringt's' project turned buses into delivery vehicles. This initiative, led by the Altona district authority, the VHH and other project partners, introduced a new delivery service in Rissen. Residents could use the village bus (route 388) to have goods bought in Rissen shops conveniently delivered to the nearest bus stop.

4.3.3.5 Involved Stakeholders

The stakeholders involved included various public, mobility, commercial and local actors. The public actors are the District of Altona and the Senate Chancellery. In the mobility sector, VHH Mobility is the key actor. On the commercial side, local retailers and the local retail association played important roles. In addition, the local school and residents were actively involved in the initiative.

4.3.3.6 Contact

District of Altona, MOVE21@altona.hamburg.de

4.3.4 Combined Transport - On-Demand Shuttle

4.3.4.1 Why

The measure aims to address 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 is to identify problems and develop efficient solutions. The innovative approach of integrating passenger mobility with freight transport aims to reduce costs and emissions. Collaboration with social institutions and aid organisations also promotes community solidarity, with goods being transported free of charge during the test phase.

4.3.4.2 Description of the measure

The focus of the pilot was to test more flexible transport services through on-demand shuttles and to explore how increased flexibility in travel times and routes affects delivery service quality. To ensure comprehensive testing, the pilot transported both real and sample consignments, with the participation of consignors in Grosse Elbstrasse and Schnackenburgallee, all within the MOIA operating area in Hamburg. The trial used a combined passenger and freight transport system, with the overall aim to reduce costs and emissions. In the pilot two different kinds of shipments were handled. One the one hand, real shipments from the warehouses of social organisations were delivered to other social organisations that hand out the donated goods via the ride-sharing provider MOIA. On the other hand, city courier shipments were simulated by using real data from previously delivered city courier shipments to re-perform these with the on-demand shuttle and the courier that was hired for the pilot. MOVE21 focuses on improving the efficiency and use of existing vehicles and transport infrastructure, increasing accessibility and innovation in urban transport. The trial period gave first insights into critical questions about delivery rates, courier waiting times, packaging, pricing models, customer accessibility, the adequacy of space in MOIA vehicles, the suitability of a 3-hour delivery window and potential improvements to the delivery process.

Figure 16 Combined Transport On-Demand Shuttle © DB Oliver Lang

4.3.4.3 Solutions, systems, services implemented

The solutions, systems and services implemented under the action included the actual escort of consignments, covering the collection, escort and delivery of goods. The contractor is responsible for providing personnel or contracting qualified third parties for the transport, with any third-party involvement to be agreed upon or outlined during the tender process. The goods to be transported included real consignments from established consignors at Schnackenburgallee and Grosse Elbstrasse, supplemented by mock consignments to simulate additional volumes and test various scenarios. The measure also included the use of open parcel stations at the stations, managed by DB InfraGO AG, where compartments can be booked via a booking portal after training by the project partner.

4.3.4.4 Main innovative aspects

Combined delivery transport.

4.3.4.5 Involved Stakeholders Replication

The involved Stakeholders are MOIA, DB Smart City, Hanseatic Help, der Hafen Hilft, and City express, District of Altona.

4.3.4.6 Contact

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District of Altona, MOVE21@altona.hamburg.de

4.4 Munich

Munich, with a population of more than 1.5 million, is a transport hub and an urban node at the intersection of two TEN-T corridors. Munich has a strong public transport system connected to the greater Munich region, including bus, underground, metro and tram lines. The modal split is: 24% public transport, 34% private car, 18% cycling, 24% walking. There is a wide variety of shared mobility modes (cars, bicycles, e-mopeds and e-scooters). The city of Munich is one of the 100 Climate Neutral and Smart Cities and has an approved Mobility Strategy 2035 with 19 sub-strategies, including Sustainable Logistics Strategy, Digitalisation, Innovation Management. One of the concrete goals of the mobility strategy is that by 2025, at least 80 per cent of traffic in the city of Munich will be covered by zero-emission vehicles, public transport, walking and cycling.

4.4.1 Munich's first bike logistics hub at Viehhof: climate-friendly deliveries on the last mile

4.4.1.1 Why

No other city delivers as many parcels as Munich. From the Viehhof, five logistics companies deliver parcels to private individuals and goods and pallets to businesses, tradespeople and construction sites on the last mile - all with state-of-the-art electric cargo bikes that keep traffic out of residential areas. This also makes the roads safer and protects the environment. At the same time, the attractiveness of Munich as a business location is maintained.

Figure 17 First Cycle Logistic Hub at Viehhof for Sustainable Deliveries © LHM DobnerAngermann

4.4.1.2 Description of the measure

From the Viehhof, five logistics companies currently deliver parcels to private individuals and goods and pallets to businesses, tradesmen and construction sites over the last mile. The transport is carried out by state-of-the-art electric cargo bikes, which relieve residential areas of car traffic, make the roads safer and protect the environment. At the same time, Munich's attractiveness as a business location is maintained because the supply and disposal of goods is guaranteed even in densely populated inner-city areas, despite the sharp increase in the number of consignments.

4.4.1.3 Solutions, systems, services implemented

The new facility offers logistics companies an attractive platform for entering or further expanding the field of cargo bike logistics. According to a study by the EU-funded CycleLogistics project 51% of all motorised transport in European cities could be shifted to cargo bikes: 69% of private and 31% of commercial trips. In a densely built-up city like Munich, the main problem is the lack of suitable space for cycle logistics. The Radlogistik-Hub am Viehhof is intended to show how a successful operation is possible despite cramped conditions. The pioneering project is to serve as a basis for planning a hub network in the city, for which EU funding is also being provided.

4.4.1.4 Main innovative aspects

The parcel services no longer drive their large transport vehicles to individual houses, but to the hub on a municipal site at the Viehhof next to the Volkstheater. Deliveries for the last leg of the journey are transferred to electric cargo bikes in six containers and taken to the recipients. This means less traffic, less noise and less emissions. The reloading is expected to save 4,000 journeys with transport vehicles per year and produce six tonnes less CO_2.

4.4.1.5 Involved Stakeholders

The new hub is managed by the city's P+R GmbH and operated on the site of the Munich market halls by the city's Department of Urban Development. The project is supported by the Munich and Upper Bavaria Chamber of Industry and Commerce as part of the "Mobile Future Munich" (MZM) strategic alliance and receives financial support from the Bavarian State Ministry for Housing, Construction and Transport. The following logistics partners are currently involved: Citylog, UPS, Hermes, B4B Logistics, Interkep.

4.4.1.6 Replication

This measure replicates the Neighborhood Hub Holstenstrasse from Hamburg.

4.4.1.7 Contact

City of Munich, Jan-Hendrik Müller, jan-hendrik.mueller@muenchen.de

4.4.2 Mobility Points - Mobility in a nutshell

4.4.2.1 Why

More and more people combine different mobility services to get from A to B in everyday life. Mobility points pick up on this change in mobility behaviour and facilitate the use of different mobility options. Shared mobility services help to overcome one of the biggest challenges facing a growing city like Munich: Providing the best possible mobility for everyone, anytime, anywhere, without having to own a car. Since the means of transport offered are used by many people and not owned by them, shared mobility relieves the pressure on parking spaces and reduces traffic in large cities.

4.4.2.2 Description of the measure

Mobility points are hubs where different transport services (and other services) are brought together in one place. They make it easier to switch from one means of transport to another, promote environmentally friendly travel and are thus an important building block for modern, sustainable mobility. At the heart of the mobility points are information pillars that display the available mobility services and make them easier to find, both in the street and digitally. The use of uniform logos and columns helps passengers to find mobility points and use shared mobility wherever they are, regardless of the provider of the service.

4.4.2.3 Solutions, systems, services implemented

By 2026, the city of Munich will have set up 200 mobility points across the city. This will make it easier for citizens to access the wide range of shared mobility options in Munich: Car-sharing, bike-sharing, e-motorbike or e-scooter-sharing allow users to be flexibly and sustainably mobile without their own car, in addition to public transport. The mobility points bundle the offers and make them easier to use.

Figure 18 Mobility Points: Bringing mobility to the point © N+P Innovation Design GmbH

4.4.2.4 Main innovative aspects

By 2026, there will be 200 Mobility Points throughout Munich, as well as Car-Sharing and micro-mobility spaces. The underlying concept was developed together with MVG and MVV - so that it can be used beyond the city limits of Munich. The goal of the Department of Mobility and the City of Munich is to establish a comprehensive network of Mobility Points so that all Munich residents have access to the services of the extended environmental network within a five-minute walk of their homes.

4.4.2.5 Involved Stakeholders

At each Mobility Point you will find different offers. Stakeholders include the Department of Mobility and the Department of Public Works as public authorities, as well as shared mobility providers who work with the city to provide their services at the points.

4.4.2.6 Replication

This measure replicates the Park and Bike Node Klippan from the City of Gothenburg.

4.4.2.7 Contact

City of Munich, Jan-Hendrik Müller, jan-hendrik.mueller@muenchen.de

4.4.3 Mobility apps: Sharing app becomes mobility platform

4.4.3.1 Why

Intuitive digital access to different modes of transport, including public transport, cycling, walking, taxis and car rental, is essential to support Munich's mobility transition. User-friendly applications that provide a comprehensive range of mobility options from different providers and service operators are essential to encourage sustainable transport choices.


Figure 19 Expansion of Mobility App Offerings planned © LHM Marienhagen/John

4.4.3.2 Description of the measure

The Department of Mobility, MVG and MVV are working together to improve and expand the information available on mobility points and shared mobility services within the MVGO and MVV apps. Three car sharing providers and other micro-mobility services will be integrated into the MVGO app and on-demand services will also be promoted. The apps will be updated with additional functionality for reserving, booking and paying for mobility options, making it easier for users to find, compare and use different services across the city and region.

4.4.3.3 Solutions, systems, services implemented

The aim of the cooperation between the Mobility Department, MVG and MVV is to improve and expand the information on mobility points and shared mobility offers in the MVGO and MVV apps. In a first step, for example, three car-sharing providers and other micro-mobility providers will be integrated into the MVGO app, and the integration and booking of on-demand offers will be promoted. In addition, the functions for reserving, booking and paying for mobility offers in the above-mentioned apps are to be expanded so that users in the city and region can find, compare and use different options even more easily in future.

4.4.3.4 Main innovative aspects

Special attention is also being paid to improving passenger information and intermodal route information in the MVV area. The aim is to optimise the links between public transport and complementary services such as bikesharing, e-trekking and on-demand transport, so that journeys using different modes of transport can be planned and made even easier and more convenient.

4.4.3.5 Involved Stakeholders

The stakeholders include the Department of Mobility, MVV and MVG as the public transport authorities, and the providers of shared mobility services.

4.4.3.6 Replication

This measure replicates the measure Integrating Micromobility with Public Transport from the City of Oslo.

4.4.3.7 Contact

City of Munich, Jan-Hendrik Müller, jan-hendrik.mueller@muenchen.de

4.5 Bologna

The Metropolitan City of Bologna (CMBO), with over 1 million inhabitants in 55 municipalities, is a key urban node in the Scan-Med corridor. As one of the first cities in Europe to adopt an integrated SUMP-SULP, Bologna combines mobility planning for both passengers and logistics. Within MOVE21, Bologna tested solutions to improve the development of the 30 mobility hubs planned in the SUMP to promote sustainable mobility and logistics integration. Replication efforts will focus on public-private partnerships and cooperation, and innovative services aimed at improving parcel delivery in the urban area, making the supply and waste disposal chain of (cycle) shops more efficient, supporting and facilitating active mobility on the occasion of major public events in the city, and generally reducing the negative impact of traffic, promoting sustainable mobility in the movement of people and logistics.

4.5.1 Automated logistics micro-hubs

4.5.1.1 Why

To mitigate the negative impacts of urban logistics, Bologna has chosen to test automated logistics micro-hubs as part of MOVE21. These hubs aim to improve the efficiency of parcel consolidation, transhipment and last-mile delivery within the city centre. This initiative is in line with the Sustainable Urban Logistics Plan (SULP) approved by the Metropolitan City of Bologna in 2019.

4.5.1.2 Description of the measure

The pilot tested a B2B hub-based approach, replacing traditional door-to-door delivery with a system focused on consolidating and transloading parcels from conventional vans to electric vehicles for the last mile. Three micro-hubs, each with around 40 lockers, were strategically located near Bologna's Limited Traffic Zone (LTZ). Drivers from large transport companies drop off parcels destined for the LTZ at these hubs and then continue their regular routes outside the zone. A last-mile operator then collects the parcels from the micro-hubs and delivers them via Zero-Emission Vehicles (ZEVs) to end users within the LTZ.

4.5.1.3 Solutions, systems, services implemented

The three micro-consolidation hubs are highly automated, unattended and centrally managed by a dedicated platform. They are designed with an open, multi-operator approach to encourage collaboration between logistics providers. Stakeholders in the initiative have established a public-private partnership through a formal agreement to further support this collaborative approach.

Figure 20 Automated logistics micro-hubs

4.5.1.4 Main innovative aspects

The innovative aspects include business model and governance innovations. In terms of business models, the project tested an innovative approach to financing commercial transport and promoted the renewal of commercial fleets towards zero-emission vehicles. On the governance side, it initiated actions by the local public administration to enable the use of public road space for logistics purposes.

4.5.1.5 Involved Stakeholders

The stakeholders involved include the Metropolitan City of Bologna, which acts as the public authority for the metropolitan region, and the Municipality of Bologna, which represents the public authority at the city level. The Instituto sui Trasporti e la Logistica (ITL), a foundation specialising in logistics, is also involved. In addition, logistics operators such as Due Torri, Typ Delivery and Salerno Trasporti are actively involved, while shops and commercial establishments participate as end users of the system.

4.5.1.6 Replication

This measure is replicating the measure Munich's first bike logistics hub at Viehhof.

4.5.1.7 Key Exploitable Results

This measure is identified as a key exploitable result.

4.5.1.8 Contact

Metropolitan City of Bologna, Mauro Borioni, mauro.borioni@cittametropolitana.bo.it

4.5.2 Combined raw-waste materials shipment

4.5.2.1 Why

Bologna tested a solution to improve the flow of materials in the bicycle repair sector. The measure was developed in response to a critical issue raised by the bicycle industry in Bologna: the inefficient management and disposal of waste materials from bicycle repairs and parts replacement, particularly rubber and metal. Currently, each bicycle repair shop handles these materials independently, leading to inefficiencies and contributing to environmental pollution.

Figure 21 Combined raw-waste materials shipment

4.5.2.2 Description of the measure

The innovative service, based at an existing Mobility Hub, uses a cargo bike to optimise the flow of materials and waste between workshops. Raw materials ordered by garages are first stored and consolidated at the Mobility Hub. These materials are then loaded onto a specially equipped cargo-bike, which delivers them to the workshops in a single trip. Once the materials have been delivered, the cargo bike collects the waste generated by the bicycle repairs. This waste is taken back to the Mobility Hub where it is consolidated before being sent to landfill for recycling, ensuring a more efficient and environmentally friendly process.

4.5.2.3 Solutions, systems, services implemented

The pilot aimed to test a more efficient and structured approach by introducing a more efficient business model for sourcing, consolidating and delivering raw materials and managing the disposal of waste materials, all coordinated through an existing mobility hub. The cargo bike made four round trips totalling 49 km, significantly reducing the estimated 250 km that would have been travelled in conventional, polluting vehicles. In the process, 24 bicycle workshops were successfully reached.

4.5.2.4 Main innovative aspects

The main innovative aspects include social, business model, service and governance innovations. Socially, the intervention reduced the number of polluting vehicle trips in the area, thereby improving the quality of the environment. In terms of the business model, a financing model was tested that promoted cooperation between different partners with a win-win approach. In terms of service innovation, a new service was incorporated into an existing consolidation scheme. In terms of governance, the initiative benefited from formalised cooperation between actors who do not normally work together.

4.5.2.5 Involved Stakeholders

Stakeholders involved in the initiative include the Metropolitan City of Bologna, which acts as the public authority for the metropolitan region. In addition, L'Altra Babele, a local non-profit association focused on cycling, plays an important role. The bicycle workshops are also key participants in the project, as they are the end users of the services provided.

4.5.2.6 Replication

This measure is replicating the measure "Cargo-waste co-freight" measure tested by Gothenburg.

4.5.2.7 Contact

Metropolitan City of Bologna, Mauro Borioni, mauro.borioni@cittametropolitana.bo.it

4.5.3 Temporary hubs for micro-mobility supporting major events

4.5.3.1 Why

In Bologna, temporary and safe micromobility hubs, locally known as BiciQui, have been tested during major public events. The aim of these hubs is to promote the use of bicycles and cargo bikes among both the general public and logistics operators, especially during large-scale public events in the city.

4.5.3.2 Description of the measure

Some areas originally intended for parking cars and private motor vehicles have been temporary converted to provide parking for bicycles and cargo bikes during public events. A clearly defined perimeter has been established around the event, marked by recognisable barriers, branded signs and posters. In addition, a dedicated stand was set up with 100 removable racks specifically designed for bicycles and cargo bikes. Security was provided throughout the event to ensure the safety of parked vehicles, and all equipment and facilities were promptly dismantled at the end of the event to return the areas to their regular use.

Figure 22 Temporary hubs for micro-mobility hubs to supporting major events

4.5.3.3 Solutions, systems, services implemented

Although it was difficult to obtain measurable participation from logistics operators, BiciQui was widely used and appreciated by the general public. Around 1,600 people parked their bicycles during the 24 tests carried out. A survey of end users showed a high appreciation of the service, with many considering it an effective solution to reduce car use and encourage the use of bicycles to reach large public events

.

4.5.3.4 Main innovative aspects

From a social innovation perspective, the project made sustainable mobility solutions more visible to the local community. It also measured the level of acceptance achieved by providing a new, sustainable option for access to crowded events, thereby reducing the space allocated for parking private cars and mopeds. In terms of business models, an efficient framework for micro-hub was developed, covering elements such as contracts, operators and ownership status. In terms of governance, the project explored the processes and operational requirements necessary to implement temporary (cargo) bike park hubs in different types of spaces, including permits and contracts.

4.5.3.5 Involved Stakeholders

Stakeholders include the Metropolitan City of Bologna, as the public authority of the metropolitan region, and Piazza Grande, a local non-profit association focused on cycling, social initiatives and event organisation. Public and private event organisers are also key stakeholders, with the general public as the final users of the services.

4.5.3.6 Replication

This measure is replicating the measure Mobility Hub Kaltenkircher Platz tested in Hamburg.

4.5.3.7 Contact

Metropolitan City of Bologna, Mauro Borioni, mauro.borioni@cittametropolitana.bo.it

4.6 Rome

Rome, Italy's capital and largest municipality with 2.9 million inhabitants, serves as a key urban node in the Scan-Med corridor. Its metropolitan area includes 120 municipalities and 4.4 million inhabitants. Within MOVE21, Rome will focus on developing solutions for active transport and sustainable freight mobility. The city will use public transport hubs, such as S. Paolo Ostiense, as test sites for logistics innovations such as small warehouses and cargo bikes for local deliveries. Rome's SUMP, to be adopted in 2019, will guide these efforts, supported by ongoing co-creation activities in the Logistics Living Lab.

4.6.1 Technical Guidelines for Metropolitan Mobility Hubs

4.6.1.1 Why

In Rome, the ongoing SUMP focuses on improving inter-modality, accessibility, visibility and IT services, with the aim of shifting part of the user base from private transport to local public transport (LPT). The action aims to acquire and share the technical aspects for the design of the Mobility Hub with engineers, designers and the Mobility Department.

Figure 23 Technical Guidelines for Metropolitan Mobility Hubs I

4.6.1.2 Description of the measure

RSM engineers and planners, directly involved in the design of mobility hubs, carried out an analysis and study of the guidelines. A series of internal meetings were held between RSM planners, technicians and the Mobility Department to review the guidelines proposed by the Metropolitan Municipality of Bologna and to assess their technical transferability.

4.6.1.3 Solutions, systems, services implemented

The result is a document that compares the Mobility Hub Design Guidelines, an innovative element introduced by Bologna, with Rome's SUMP to facilitate the replication process. For each topic - including mobility demand, preliminary assessments, pedestrian, bicycle, public, motorised and innovative mobility, as well as green design, recognisability, relationship with the territory and economic sustainability - the document highlights both the common and unique elements of the guidelines proposed by Bologna in comparison with the Rome document.

Figure 24 Technical Guidelines for Metropolitan Mobility Hubs II

4.6.1.4 Main innovative aspects

The main innovative aspects include improving accessibility, promoting sustainable inter-modality and increasing the overall attractiveness of the transport system. In addition, the collaboration between the technicians of the Mobility Department and the Mobility Agency of Rome on specific issues represents a key governance innovation.

4.6.1.5 Involved Stakeholders

The stakeholders involved are the Rome Mobility Agency as well as the Mobility Department.

4.6.1.6 Replication

The measure is replicating the Mobility hub Guidelines from the Metropolitan city of Bologna.

4.6.1.7 Contact

Agenzia Roma Servizi per la Mobilità S.r.l., Marco Surace, marco.surace@romamobilita.it

4.6.2 Emission free Goods Transport

4.6.2.1 Why

The approved SULP reaffirms the commitment to reducing freight emissions and their impacts. The approval of this framework was a crucial step in ensuring that the replication process is integrated into the implementation of a wider policy strategy.

4.6.2.2 Description of the measure

Based on suggestions from Oslo regarding the involvement of stakeholders from different supply chains, meetings were held with logistics operators. During these meetings, proximity logistics areas were proposed to serve the 'Tridente' ZTL, which serves as a pilot for the creation of a Zero Emission Zone (ZEZ). Goods will be distributed mainly by cargo bikes and electric vehicles.

4.6.2.3 Solutions, systems, services implemented

Proposed revisions to the rules for access to the LTZ are currently under discussion. Incentives are available to encourage the purchase of environmentally friendly vehicles. In addition, the locations for freight car parks and micro-hubs are being actively considered.

Figure 25 Emission free Goods Transport

4.6.2.4 Main innovative aspects

The main innovative aspects include the creation of a more sustainable freight distribution system using green vehicles and micro-hubs, which will improve the quality of life for residents and tourists in the historic centre. In terms of services, a cargo bike sharing system will be provided at the hub to facilitate deliveries within the LTZ. In terms of governance, a participatory process has been initiated between the local authorities and the private sector.

4.6.2.5 Involved Stakeholders

Stakeholders involved include the Mobility Department, the Rome Mobility Agency, businesses and citizens.

4.6.2.6 Replication

This measure replicates the Kaia Mobility Hotel measure from Oslo.

4.6.2.7 Contact

Agenzia Roma Servizi per la Mobilità S.r.l., Marco Surace, marco.surace@romamobilita.it

4.6.3 Park and Bike Node

4.6.3.1 Why

The SUMP being implemented in Rome aims to improve inter-modality with the aim of shifting part of the user base from private transport to local public transport (LPT). The measure aims to provide a range of additional services to users and citizens at key metro and railway stations.

Figure 26 Park and Bike Node

4.6.3.2 Description of the measure

Rome tested the Park & Bike node concept developed by Klippan, Gothenburg, by focusing on the integration of bicycle facilities in a metro station. This included bicycle parking boxes and a shared cargo bike rental system. The multimodal hub identified at S. Paolo metro station facilitates the transition between public transport (metro/bus) and bicycles or cargo bikes. The system also includes parcel lockers at the station, allowing the combined use of cargo bikes for deliveries.

4.6.3.3 Solutions, systems, services implemented

At the S. Paolo metro station, the bike box service was launched in September 2023. Following a call for tenders, a supplier was selected to provide a pedal-assisted cargo bike service, with three cargo bikes available for both commercial operators and private users. The pick-up point is located near the metro station and the adjacent cycle track, which is partially completed.

4.6.3.4 Main innovative aspects

The main innovative aspects include encouraging a change in travel habits to promote the health of both citizens and city users. From a business model perspective, technological innovations have been introduced, such as a cargo bike reservation system and a tracking system to monitor usage, as well as a bike box booking application. Services provided include secure bike boxes for bicycle storage, 10% of which are equipped with electric charging points, and a cargo bike service for the district. In terms of governance, a formalised collaboration has been established, involving both private and public actors and stakeholders.

4.6.3.5 Involved Stakeholders

Stakeholders include the Rome Mobility Agency, Doctorbike as the cargo bike service provider, local businesses and citizens.

4.6.3.6 Replication

This measure is a replication of the park and Bike Node in Klippan, Gothenburg.

4.6.3.7 Contact

Agenzia Roma Servizi per la Mobilità S.r.l., Marco Contadini, marco.contadini@romamobilita,it
Agenzia Roma Servizi per la Mobilità S.r.l., Marco Surace, marco.surace@romamobilita.it

5 Future fact sheets and popularised content from the project

MOVE21 has identified a range of key results that it will popularise through the publication of fact sheets. These come in addition to existing infographics (see Annex A) which are about specific measures and pilots. The project will further develop infographics during the winter season 2024/25. In addition to those infographics this chapter foreshadows future fact sheets that will be completed in the months to come.

Different types of mobility hubs and hotels have been identified as a Key Exploitable Results (KERs) from the project. This cluster includes several measures and results that when combined contribute to a body of knowledge on how to implement, design and manage mobility hubs and hotels effectively.

The Mobility Toolbox cluster of KERs directly supports MOVE21's main objective by providing a comprehensive resource on the topic. Integrating multimodal hubs that combine both passenger and freight mobility within urban areas is a strategic approach to improving transportation efficiency, reducing congestion, and promoting sustainability. These hubs and hotels can leverage shared infrastructure and digital platforms to optimise space, time, and resources. However, careful planning and coordination are necessary to ensure that both passenger and freight needs are met without compromising the quality of service for either.

Multimodal hubs allow a better utilisation of space and resources, reducing the need of more infrastructure investments. This efficiency is especially critical in urban areas where space is limited. Integrated hubs are often at the forefront of technological advancements in transport, as these hubs rely heavily on data-sharing platforms that coordinate different transport operators and services, improving overall efficiency. In fact, many of the abovementioned measures stressed the importance of real-time data and digital platforms in the operation of multimodal hubs. A key result that will be further popularised is a set of recommendations on the development of mobility hubs that will be developed in forthcoming deliverable D10.7 *SUMP Topic Guide* and popularised in a fact sheet.

Furthermore, a central tenet in MOVE21 is the development of supportive policies. MOVE21 aims to empower policy makers to strengthen cooperation between different policy areas, integrate planning processes and better align policy initiatives with practical planning. In doing so, MOVE21 promotes policies that work together, rather than in isolation, to effectively address multiple urban challenges. An own fact sheet on supportive policies will also be developed during winter 2024/25. This is closely linked to the work on innovation capacity, detailed in deliverables such as D6.7 *MOVE21 Guide on improving city's capacities for promoting sustainable mobility and logistics innovation.*

Multimodal passenger hubs also present an opportunity to build new kinds of partnerships. Collaboration between public and private sectors is crucial for scaling multimodal hubs for passenger and freight. Local governments, transport companies, logistics operators, and technology providers must work together to create standardised systems and policies that support the smooth functioning of these hubs. Regulatory frameworks will need to encourage investment while ensuring that the hubs align with broader urban development goals, such as reducing traffic congestion and improving air quality. Insights on collaboration and partnerships is presented in a forthcoming White Paper entitled *Working Together: Public-Private Collaboration in Urban Mobility and Logistics.*

The challenges are numerous for scaling innovations and aligning them across different urban nodes, regional, and corridor levels (such as the TEN-T). The EU's trans-European transport network policy, known as the Trans-European Transport Network (TEN-T) policy, is a key instrument for planning and developing a coherent, efficient, multimodal, and high-quality transport infrastructure across the EU.

The network comprises railways, inland waterways, short sea shipping routes and roads linking urban nodes, maritime and inland ports, airports and terminals. The new EU TEN-T regulation of 2024 outlines a set of novel requirements that 432 European urban nodes are expected to fulfil. Among others, these include the adoption of Sustainable Urban Mobility Plans (SUMPs) and the development of multimodal passenger hubs and freight terminals. Fulfilling the ambitions in the revised TEN-T Directive poses new challenges and opportunities for European cities.

The lessons learnt from MOVE21, particularly in terms of integrating freight logistics with passenger mobility in urban environments, provide interesting insights and elements within the ongoing challenges to integrate planning in the Functional Urban Area (FUA) within the TEN-T dimension. MOVE21 has launched the Scan-Med Observatory, with the aim to improve collaboration between local, regional, and European stakeholders, ensuring that cities' needs are prioritized in TEN-T planning, particularly in terms of sustainable and smart mobility. In addition, and as part of the Observatory's activities, the project has engaged with numerous projects, policy roundtables and events on how to best implement the revised TEN-T regulation in the designated urban nodes. Based on this extensive activity, MOVE21 has distilled some main takeaways that will be further elaborated in a forthcoming fact sheet, and some of the takeaways include an identified clear need for investments in rail infrastructure, an enforcement of policy coherence on local and national levels, the priorisation of land use and transport planning in multi-level governance, and governance as a key aspect by which to define urban nodes and their scope and finally more vertical integration of infrastructure and governance as part of SUMP processes.

6 Conclusion and further steps

This deliverable provides an overview of the measures implemented by the Living Lab Cities and Replicator Cities throughout the MOVE21 project, compiled in the form of harmonised and synthetic factsheets.

Solutions and key results for the measures in the cities are presented through fact sheets and infographics, offering an appealing and easily accessible way to understand city measures and results.

The recommendations related to the development of mobility hotels and mobility hubs is a main takeaway illustrated in the document. Also illustrated in the document is the integration of transport modes, exemplified both by combining various services in mobility hubs and developing digital solutions offering several services at hand for the user. Insight is given in policy recommendations both on local level and on the TEN-T network level. These recommendations will be further elaborated and disseminated through future fact sheets.

This deliverable is seen as a step towards compiling fact sheets related to key results of the project. It will be followed up with further fact sheets focussing on policy recommendations both on the local level, as well as on the TEN-T network level. These results will contribute to achieving the main goal of MOVE21 which is to transform European cities and functional urban areas into climate neutral, connected multimodal urban nodes for smart and clean mobility and logistics.

Annex A

All infographics developed until October 2024 are gathered here. More infographics will be developed.

INTEGRATING MICROMOBILITY WITH PUBLIC TRANSPORT

Oslo, Norway

By integrating micromobility with public transport, we can offer the user a seamless multi-modal experience and an easy-to-use solution for the operators. It should be easy to jump from a bus to a city bicycle, all in one app!

Jasmina Vele, Head of Operations, Urban Sharing

Oslo is testing the efficiency and need for a simplified, resource-light Mobility as a Service (MaaS) Application Programming Interface (API) from an Operator perspective.

What's new?

The API developed by Urban Sharing is a simple, bare-bones API that excludes Personally Identifiable Information (PII), making it easier for mobility operators to integrate it into their systems.

THE API ALLOWS FOR AN EASY WAY TO LAUNCH MAAS SERVICES

IT ALLOWS MOBILITY OPERATORS TO HANDLE CUSTOMER SUPPORT DIRECTLY

IT ENABLES PARTNERSHIPS BETWEEN PUBLIC AND PRIVATE MOBILITY OPERATORS

Stakeholders

CITY OF OSLO

URBAN SHARING

Why?

- Cooperation between mobility operators, both public and private, will create seamless multimodal experiences for customers
- The coding language-agnostic API enables the lock/unlock of vehicles and allows for collecting quantitative multimodal trip data to improve multimodal solutions and reduce car ownership, congestion, and pollution

KEY INNOVATION:
Efficient integration and GDPR compliance via a simplified API

PARK AND BIKE NODE KLIPPAN

Gothenburg, Sweden

We are using the existing environment and its preconditions to stimulate the emission-free mobility of people.
By designating a mobility hub and showcasing the various transport options available to citizens, we can inspire and catalyse a shift towards more sustainable travel behaviours!

Sara Mellberg, City of Gothenburg, Test site leader

The City of Gothenburg wants to make the existing shared mobility solutions more attractive

What's new?

To achieve this goal, the city of Gothenburg will implement the following three solutions during the spring and summer of 2023:

NEW STATION FOR RENTAL BIKES

REPURPOSING PARKING SPOTS INTO DESIGNATED MOBILITY HUB SPACE

IMPROVEMENTS ON GUIDANCE AND ORIENTATION IN BIKE INFRASTRUCTURE

Stakeholders

CITY OF GOTHENBURG

CITIZENS

MICROMOBILITY COMPAGNIES

GÖTEBORGS STADS PARKERING

Why?

- Enable sustainable and emission-free travel behaviours while acknowledging future changes in the surrounding area
- Make use of the existing shared mobility solutions
- Collect knowledge to develop mobility hubs

KEY INNOVATION:

- Transform parking spots into mobility hubs
- Guide people to shared mobility options

THIRD-PARTY INTEGRATION IN PARKING APP

Gothenburg, Sweden

Integrating mobility services into one app is a crucial step towards sustainable transportation solutions. Making a standard API setup would facilitate the development of integration for personal transport services. Such approaches have the potential to bring significant benefits across Europe.

Suzanne Green, Project Manager, City of Gothenburg

Gothenburg's Stads Parkering AB's app allows you to buy public transport tickets - can this be extended to other mobility services?

Yes, but how?

By integrating different **mobility services** from diverse operators in a **parking app**, Gothenburg aims for traditional motorists to try other modes of transport!

MOTORISTS ARE USING THE **GOTHENBURG'S STADS PARKERING AB'S APP** TO PARK THEIR VEHICLES

THE CITY IS **TESTING** IF THIS APP COULD BE USED TO GATHER OTHER **MOBILITY SERVICES**

THIS WAY, **USERS CAN EASILY ACCESS** ALTERNATIVE MOBILITY SERVICES TO THE CAR

Stakeholders

CITY OF GOTHENBURG

CITIZENS

MICROMOBILITY COMPAGNIES

GÖTEBORGS STADS PARKERING

Why?

- Reduce car usage and promote sustainable transport
- Paving the way for further innovation, possibly in the form of an Application Programming Interface (API)
- Facilitate access to alternative mobility services

KEY INNOVATION:
Access to multiple mobility services via a parking APP

CARGO-WASTE CO-FREIGHT LINDHOLMEN

Gothenburg, Sweden

A concept for parcel boxes B2B is being developed and evaluated in Lindholmen

What's new?

The use of parcel boxes enables contactless delivery, allowing suppliers to reload and transport outgoing goods jointly, while customers are notified when packages are ready for collection, streamlining the delivery process with convenience and flexibility.

THERE ARE TWO PILOT PHASES DURING WHICH TECHNICAL SOLUTIONS AND BUSINESS MODELS WILL BE EVALUATED

PARCEL BOXES ARE LOCATED ABOUT 1 KM APART TO ALLOW TENANTS TO SEND AND RECEIVE GOODS

NEXT STEPS INVOLVE DECISIONS ON UPSCALING, MAKING PERMANENT, OR REDESIGNING THE MEASURE

Stakeholders

PROPERTY OWNERS

CITY OF GOTHENBURG

RENOVA MILJÖ

COMPANIES

Why?

- Provide improved services to the businesses in the area
- Adjust freight handling to a higher service level towards the companies around Lindholmen
- Reduce motorised traffic, emissions, and congestion

KEY INNOVATION:
Develop, pilot, and evaluate concepts while maintaining a high service level for customers and freight carriers

What's new?

MOBILITY HOTEL

Gothenburg, Sweden

> The innovation within this test site is mainly the combination of goods and personal mobility.
> The different types of partners involved have never cooperated before on this specific theme, and the concept is very unique and does not exist anywhere else!
>
> *Anastazia Kronberg, Business Region Gothenburg*

Gothenburg combines freight and personal transport by introducing a mobility hotel

What's new?

MICROMOBILITY HOTEL FRONT ENDHUB

The micromobility hotel provides a central space in a shopping centre featuring:

- a bike repair shop as well as
- micromobility businesses

This proximity gives them the opportunity to work together to provide services, sales, last mile delivery and in-store battery replacement.

HANDYMANHUB BACK ENDHUB

The handymanhub enables local service providers to:

- share a garage space and
- utilize a shared fleet of micro mobility vehicles

Thus offering easy access to efficient and sustainable transportation options .

Stakeholders

SERVICE PROVIDERS · MICROMOBILITY COMPANIES · CITIZENS OF GOTHENBURG · PROPERTY OWNERS

Why?

- Reduction in motorised transport for deliveries, personal mobility, and service providers
- Provision of alternative mobility services to promote clean and green travel behaviour
- Creation of a cleaner, safer, and more sustainable environment in and around Nordstan

KEY INNOVATION:
Business Model: Sharing space, costs, and responsibilities between parties, utilizing central real estate, and overcoming barriers in private-public partnerships.

NEIGHBOURHOOD HUB HOLSTENSTRASSE

Hamburg, Germany

The new neighbourhood hub of Altona Altstadt addresses the existing shortage of space with its mixed-use concept: sustainable solutions for the movement of goods are now being further established, and sociocultural offers and donations will create a new central point of contact that will be continuously developed *for* and *with* the people in the neighbourhood. New or additional mobility solutions will also be explored and implemented during the project period!

Stefanie von Berg, District Mayor of Altona, Free and Hanseatic City of Hamburg

Holstenstrasse 20: A single space for mobility offers, logistics, and social projects

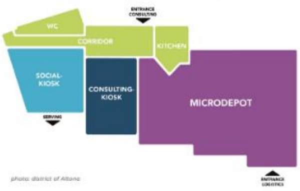
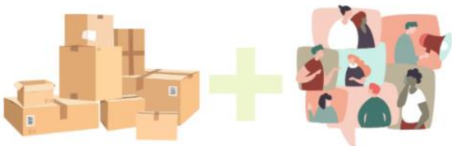


photo: district of Altona

What's new?

A previously vacant building has now been re-designed as a **multifunctional hub** for both **commercial** and **public** use



SPACE TO RELOAD PACKAGES AND GOODS TO REDUCE TRAFFIC — DELIVERIES AND PICK-UPS WITH ELECTRIC CARGO BIKES

SOCIAL SERVICE AND CONSULTATION KIOSK — OFFERING CONSULTATIONS AND SUPPORT SERVICES AS WELL AS FOOD AND SUPPLIES

NEXT: Personal mobility solutions that may fit into the hub and support active and sustainable mobility options for the wider community will be explored

Stakeholders

- SOCIAL SECTOR
- DEUTSCHE BAHN
- SOCIAL HOUSING
- LOGISTIC COMPAGNIES
- RESIDENTS

Why?

- Reduce the amount of traffic coming from the transport of goods and offer climate-friendly solutions
- Provide support and consultations for neighbourhood residents
- Address the existing shortage of space with a multifunctional concept that can be adapted and scaled for further neighbourhood hubs in Hamburg and beyond

KEY INNOVATION:
Last mile logistics **and** social offers **under one roof creating a** liveabe neighbouhood

Annex B

MOVE21 logo

Title of the measure

NAME OF THE CITY	PHOTO

Why (35-50 words)

Description (50-70 words)

Solutions, systems, services implemented (35-50 words)

Main innovative aspects

Social, business models, technological, service, governance

Stakeholders involved:

Full names and category (e.g. public transport authority, mobility provider, shipper, etc.)

Replicated in:

Name of the city

For more info:	About the project:
Name, Surname, Role of the city partner Mail address	Website LinkedIn X