REPLICATION REPORT

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Author(s): Anne-Charlotte Trapp (Eurocities)

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List of abbreviations and acronyms

Acronym	Meaning
B2B	Business-to-Business
B2C	Business-to-Consumer
BCR	Brussels Capital Region
CCNY	Click and Collect Near You
C2C	Consumer-to-Consumer
EC	European Commission
GA	Grant Agreement
KPI	Key Performance Indicator
LEV	Light Electric Vehicles
LEZ	Low Emission Zone
LTZ	Low Traffic Zone
LSP	Logistics Service Provider
RSM	*Roma Servizi per la Mobilità*
SULP	Sustainable Urban Logistics Plan
SUMP	Sustainable Urban Mobility Plan
UVAR	Urban Vehicle Access Regulation
WP	Work Package
ZEZ	Zero Emission Zone
ZTL	*Zona a Traffico Limitato*
UVAR	Urban vehicle Access Regulation

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Abstract

This deliverable presents the results of the replication activities conducted within the CodeZERO project to assess the transferability of innovative zero-emission last-mile delivery solutions tested in the Living Labs of Oslo, Utrecht, Antwerp and Milan. The replication programme engaged eleven European cities and eight private-sector logistics and retail stakeholders in a structured process consisting of study visits, replication workshops, transferability assessments and the development of replication action plans.

The analysed measures include neighbourhood click-and-collect points, mobile micro-hubs, out-of-home delivery and parcel collection solutions, sustainable cargo-bike logistics, and communication measures encouraging more sustainable consumer choices. Replicators assessed the measures against a common framework covering regulatory conditions, organisational capabilities, stakeholder engagement, funding, market maturity and governance aspects.

The results show that most measures demonstrate moderate to medium to high replication potential, although their successful transfer depends strongly on local conditions. Key enabling factors include supportive regulatory frameworks, access to suitable urban space, stakeholder cooperation, political commitment and sufficient delivery density. Major barriers include competition for urban space, limited market maturity for certain logistics concepts, financing challenges and business-model viability.

The deliverable concludes that sustainable urban logistics solutions cannot be directly copied between cities but require adaptation to local governance structures, mobility policies, market characteristics and urban form. The findings provide practical guidance for local authorities and logistics operators wishing to accelerate the transition towards zero-emission urban freight and contribute to the development of the CodeZERO replication toolbox Deliverable 6.3.

Executive Summary

The CodeZERO project aims to support the transition towards sustainable and zero-emission e-commerce deliveries by developing, testing and promoting innovative last-mile logistics solutions that respond to the needs of consumers, retailers, logistics operators and local authorities. As part of this objective, the project established a replication programme to evaluate whether the solutions tested in the Living Labs could be transferred to other national and European urban contexts. This deliverable presents the outcomes of these replication activities and identifies the conditions required for their wider deployment.

The replication programme involved eleven cities and eight companies from across Europe. Participants took part in study visits to the pilot cities and attended structured replication workshops during which they assessed the transferability of the tested measures and developed preliminary action plans for local implementation. A common assessment framework was used to evaluate regulatory conditions, governance arrangements, organisational capacity, funding availability, stakeholder engagement and market readiness.

Four different pilot measures were analysed:

- **Oslo** tested IKEA's neighbourhood Click and Collect Near You concept, using mobile pick-up points located close to consumers. Replication assessments showed strong potential in cities with sufficient delivery density, available parking space and supportive cooperation between municipalities, retailers and logistics providers. However, the measure may be less effective in highly car-dependent areas where customers are more likely to drive to collection points.
- **Utrecht** tested a mobile micro-hub model combining an electric van with smaller zero-emission delivery vehicles such as LEVs and cargo bikes. The results indicate that this model is particularly relevant in cities with access restrictions, pedestrianised areas or zero-emission zones where conventional delivery vehicles face operational challenges. The availability of suitable hub locations and sufficient delivery density emerged as the most important conditions for successful replication.
- **Antwerp** focused on encouraging consumers to use out-of-home delivery options through an expanded PUDO network, incentives and communication measures. The replication exercises highlighted that successful implementation depends on a well-developed network of collection points, cooperation with logistics operators and retailers, and effective and collaborative communication strategies capable of influencing consumer behaviour.
- **Milan** tested the use of higher-capacity cargo bikes and strengthened sustainability communication within IKEA's delivery operations. Replicators recognised significant environmental and social benefits, particularly where urban access restrictions support cycle logistics. At the same time, the assessments identified challenges relating to operational scalability, market demand, funding mechanisms and access to urban micro-hubs. The Milan pilot also demonstrated the potential of combining sustainable logistics with social inclusion objectives through employment and training opportunities.

The replication programme demonstrates that the solutions tested within CodeZERO are transferable to other national and European context both form a public authority and private stakeholder perspective, provided they are adapted to local conditions. Rather than promoting a one-size-fits-all approach, the findings underline the importance of context-sensitive implementation strategies that combine regulatory support, stakeholder engagement, operational feasibility and sustainable business models. The lessons learned from the replication activities provide practical guidance for both local authorities and logistics operators seeking to accelerate the transition towards cleaner, more efficient and more socially responsible urban freight systems.

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1 Introduction

1.1 About CodeZERO

CodeZERO is a three-year Horizon Europe research project aiming to co-create sustainable and zero-emission last-mile delivery and return solutions for ecommerce that align with consumers' preferences while being sustainable for retailers, logistics operators and local authorities. Additionally, the project is focused on providing clear, consumer-friendly communication and developing
tools for local authorities to promote eco-friendly behaviour.
CodeZERO is articulated in four phases:

- An ANALYSIS phase which provides (1) an analysis of existing delivery and return options and an understanding of how they are shaped by the needs and constraints of all involved stakeholders; (2) an in-depth intersectional analysis of various groups of on-line consumers to understand what are the features of delivery and return options making them attractive, with the aim to identify mechanisms to incentivize behaviour changes; and (3) develops an assessment framework to measure the impacts in the environmental, economic and social domains of new solutions.

- A DESIGN phase, in which CodeZERO engages in a co-design process involving retailers, transport operators, consumers and local authorities in developing (1) guidelines for retailers to raise awareness among customers; (2) a set of zero-emission and sustainable delivery and return options for retailers and transport operators; and (3) a toolset for local authorities to accelerate the transition towards sustainable solutions in last mile consignments in e-commerce.

- A TEST phase running 4 pilots in 4 different European cities in Italy, Netherlands, Belgium, and Norway to test a set of sustainable solutions identified in the previous phase with the aim to prove their feasibility, to fine-tune their design and to assess their impacts from the perspective of all stakeholders.

- A CONSOLIDATION phase where (1) CodeZERO outcomes are fine-tuned based on the lessons learned from real life applications, (2) requirements for up-scaling of solutions at European level are discussed (3) recommendations are formulated and (4) directions for future research are outlined.

Engagement with consumers and retailers' associations, industry stakeholders, cities and researchers contribute to shaping project results. Running from June 2024 to May 2027, CodeZERO is organized along eight WPs:

- WP1 Analysis of current delivery models
- WP2 Analysis of consumers' behaviour
- WP3 CodeZERO assessment framework
- WP4 Design of CodeZERO solutions
- WP5 Testing solutions: CodeZERO living labs
- WP6 Conclusions and recommendations
- WP7 Dissemination, communication and exploitation
- WP8 Project management.

1.2 Aim of this document

This deliverable describes the replication activities and subsequent analysis carried out within the CodeZERO project. The main aim of the deliverable is to demonstrate how replicator cities and companies operating in similar national contexts assess the replicability of the measures tested within CodeZERO and to see which replication potential it has in other local European contexts. It examines the extent to which these measures could be transferred to other urban and operational contexts, taking into account the specific conditions and requirements identified by the replicators. The document also illustrates how replicator cities and companies could implement similar measures in their own contexts through the outline of an action plan. In doing so, it aims to inspire other cities and companies to consider the replication of CodeZERO measures, while providing insights into the potential challenges, complexities, and enabling factors that may influence the replication process.

The findings presented in this deliverable will also contribute to the development of the CodeZERO toolset for local authorities. In particular, the analysis provides conclusions on the tested measures from the perspective of local authorities and highlights the conditions that can facilitate or constrain their implementation and replication.

2 Summary of the replication activities and methodology

2.1 Selection of the replicators

The selection of replicators followed a two-step approach in Oslo, Antwerp and Milan:

- **Open call to become a replicator:** An open call was launched to invite cities and companies interested in becoming replicators in October 2024. It was shared in the mailing list of the stakeholder engagement forum, as well as on LinkedIn and through ALICE network (as member of the advisory board).
- **Targeted outreach:** Targeted outreach was conducted towards local authorities and companies to increase the number and diversity of applications getting closer to the date of the study visit.

All applicants who applied in the appropriate country got selected, however eventually not all confirmed their participation. In Oslo eventually the recruitment of a second replicator company failed as DSV/Schenker declined the participation last minute due to internal reorganisation. Posten Bring took part in the replication programme with two distinguished departments. With one that was not involved in the pilot implementation in Oslo. The discussion with them was rather focused on how they would be able to replicate the solution in other Norwegian cities after having tested the concept in Oslo. In Antwerp, Comes did not join the study in the end due to lack of capacity.

In Utrecht, the recruitment process was slightly different. The DMI Ecosystem Working Group became involved in the organisation of the study visit, as its meeting was organised back-to-back with the visit. As a result, three cities and two companies willing to act as replicators were selected from among the participants of the Working Group. The replicator day was finally attended by a total of 5 companies and 5 cities.

Overall, the number of expected replicators was reached with a total of 8 replicator companies taking part in the replication activities and 11 replicator cities (against the 8 originally foreseen).

Table 1: Replicator cities and companies per pilot

Pilot location	Replicator cities	Replicator companies
Oslo	• Bergen • Stavanger	• Bring Courier Express
Utrecht	• Nijmegen • Den Haag • Eindhoven	• DHL eCommerce • Budbee
Antwerp	• Brussels Capital Region • Bruges • Mechelen	• Les chercheurs d'air • GLS
Milan	• Rome - RSM • Bologna • Parma	• Parrott Delivery • UPS • La Sajetta

2.2 Study visits and replication workshops

In each pilot location, a **full-day study visit and replication workshop** was organised (an exemplary agenda is available in Annex D). The activities combined an opportunity to learn directly from the pilot with structured exercises aimed at assessing the potential transferability of the tested measures to the replicators' local contexts. The replication workshop followed a common structure:

1. **Presentation of the replicators' context**

Replicators presented their local context and outlined what they had already done in the field of last-mile logistics, including relevant measures, initiatives and experiences in communicating about last-mile logistics towards citizens or consumers.

2. **Interactive exercise 1 – Assessing replicability**

Participants worked in smaller groups to assess the replicability of the pilot measure around one replicator city or company. A dedicated template (see Annex A and B) was used to structure the assessment around a set of predefined criteria. The representatives of the replicators (city or company) had to rank the different criteria from 1 (lowest) to 5 (highest) and indicate further qualitative justification next to each dimension this is further referenced to as self-assessment. No answer was given the value 0 and the mention N/A. Based on those results of this self-assessment, spider charts were developed for this Deliverable per replicator to showcase the replicability potential at one glance across the unique dimensions.

3. **Interactive exercise 2 – Defining implementation requirements**

The second interactive exercise focused on identifying the steps that would be required to implement the measure in the replicators' local context using a specific template available in Annex C. In smaller groups usually structures around one replicator city and one replicator company, participants considered:

- the refinements or adaptations that might be required to fit the local context; and
- the implementation steps needed to replicate the measure; and
- the stakeholders that would need to be involved in the implementation process.

This led to the development of Replication Action Plans which are presented in each replicator section. The following four chapter detail the outcomes of those activities by pilot location and by distinguishing the replication outcomes for the public authorities and the companies engaged in the programme. General conclusions on the replicability of each pilot close each of these four chapters.

3 Replicating the measures piloted in Oslo

3.1 Overview the Oslo pilot measures

The Oslo Living Lab focuses on IKEA's Click and Collect Near You (CCNY) service, a mobile neighbourhood pick-up solution designed as an alternative to both conventional home delivery and customer travel to IKEA stores or warehouse locations. The pilot tests whether bringing IKEA orders closer to customers through temporary, conveniently located collection points can reduce delivery-related vehicle kilometres while providing a convenient and lower-cost alternative for customers and transport operators.

Under the CCNY model, customers place their orders online and select a nearby mobile pick-up point and a specific collection time window. The pick-up points are located in areas intended to be accessible by walking, cycling and public transport. At each location, an electric van operates as a temporary collection point, parking for a one-hour fixed time slot once or twice a week and allowing customers to collect their orders without travelling to an IKEA store or receiving an individual home delivery.

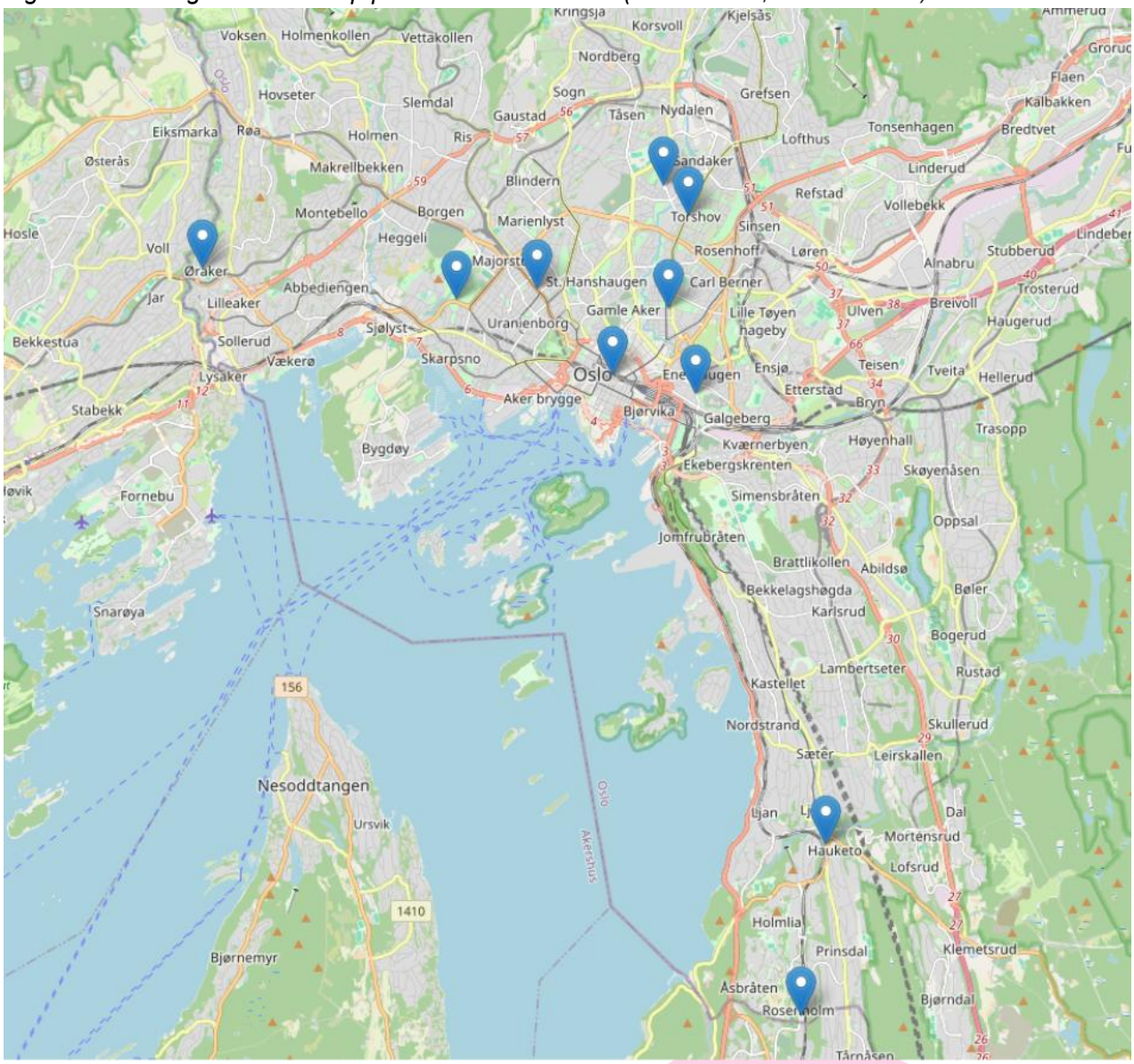
The pilot initially deployed 10 mobile pick-up points across Oslo. During the implementation, three locations were discontinued because of limited customer uptake. These locations were situated outside the city centre, in more suburban areas, providing an important indication of how the location and accessibility of neighbourhood pick-up points can influence the viability and use of the service.

The deployment of CCNY was complemented by customer communication measures aimed at increasing awareness, visibility and uptake of the service, including communication highlighting its sustainability benefits and its alternative to conventional delivery options.

Figure 1: IKEAs CCNY pick-up point on Stortorvet Square, Oslo



Figure 2: The original 10 Pick-up point locations in Oslo (Source: TØI, Howard Weir)



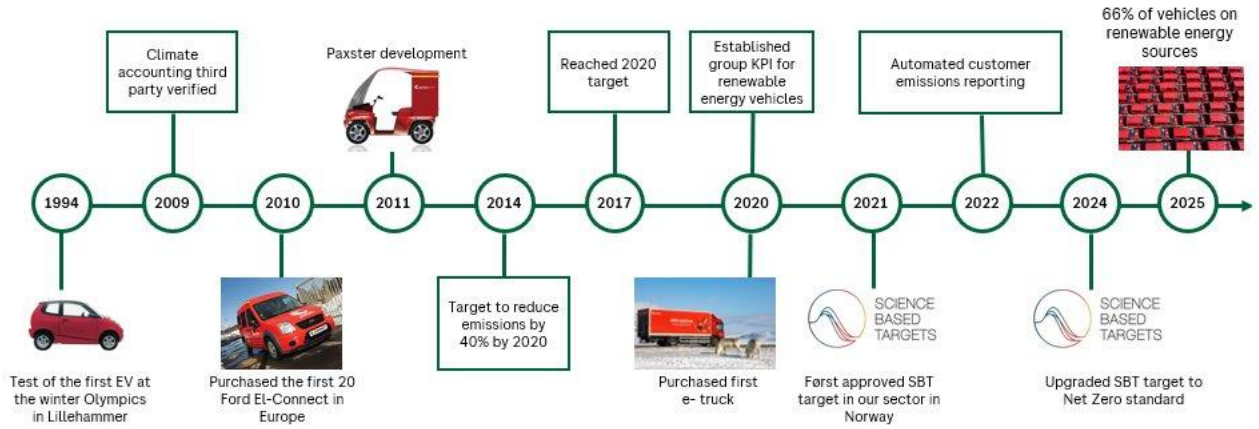
3.2 Replicability by private actors

3.2.1 Posten and Bring

3.2.1.1 Background information about the company

Posten Bring AS is a Nordic postal and logistics group that develops and delivers comprehensive solutions within post and logistics. It has over 12,500 employees and meets the market with the two brands Posten and Bring. Posten delivers packages and letters to private individuals throughout Norway. Bring offers solutions for corporate customers in the Nordic market and or private customers in Norway and outside. Bring Courier & Express AS manages the last-mile delivery operations for IKEA, delivering directly from store to customers. Posten Bring worked on emission reduction over the past years (see Figure 4).

Figure 3: Sustainability related actions undertaken in Posten bring since 1994 (Source: Bring)

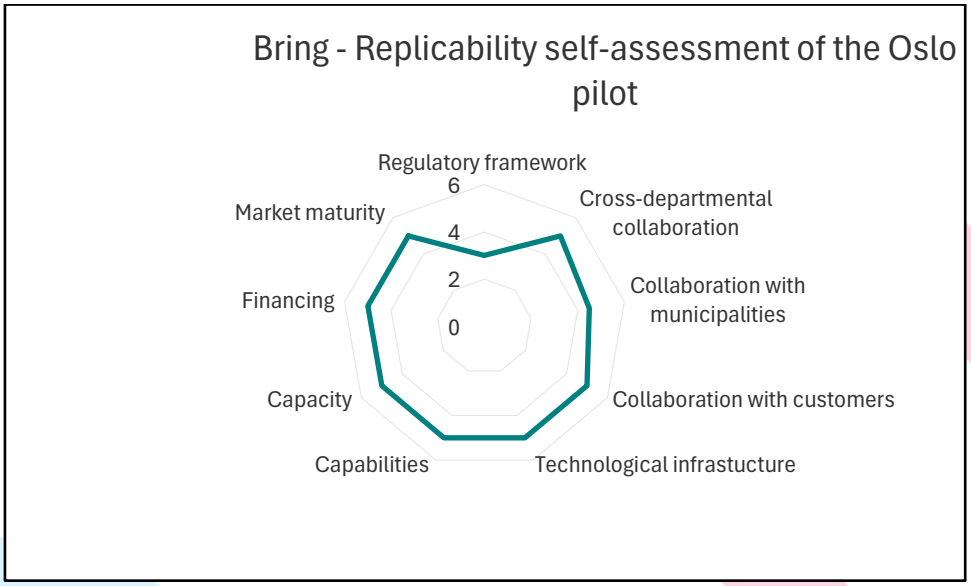


3.2.1.2 Replication Assessment

The Oslo pilot measure is considered relatively easy for Bring to replicate, as the company already manages the operation in Oslo and has extensive experience with the model. As one of Norway's largest logistics providers, Bring has established operational capacity, existing connections with local authorities, and the internal resources and expertise required to transfer and implement the model in other locations.

Yet necessary regulatory and operational conditions need to be in place for the replication to proceed smoothly. The main factors to consider are the local regulatory frameworks governing the use of parking space and the availability of suitable locations for temporary pick-up points. Ensuring that the service is also sufficiently visible and well communicated to consumers is important for generating the level of uptake required to make the model viable. The main limiting factors remain the fact that this model is not well known by customers or other retailers. Efforts in disseminating the pilot results would mitigate this issue.

Figure 4: Bring replicability self-assessment of the Oslo Pilot



3.2.1.3 Action Plan

The replication steps for Bring follow similar steps as to those undertaken during the pilot with IKEA as main retail partner. The below Table x provides the details of those steps.

Table 2: Bring Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1*	*Get involved in discussions with retailers (IKEA or other) and local authority to explore feasibility*	*Bring, Local authority and Retailers*
2	*Month 2*	*Take part in selection of delivery location*	*City administration, LSP (Bring), Retailers*
3	*Month 3*	*Negotiate price of delivery model with the retailer*	*Retailers, LSP (Bring)*
4	*Month 4*	*Adopt internal operations (routes and drivers)*	*Bring*
5	*Month 5-9*	*Promotion of the delivery option*	*Retailer, LSP (Bring), City administration*
6	*Month 5-9*	*Test new operation model*	*Retailer, LSP (Bring), City administration*
7	*Month 5-10*	*Evaluate the delivery model*	*Retailer, LSP (Bring), City administration*
8	*Month 11*	*Discuss long term operational adoption*	*Retailer, LSP (Bring), City administration*

3.3 Replicability by public authorities

3.3.1 Stavanger

3.3.1.1 Background information about the city

Stavanger is a city of approximately 150,000 inhabitants, characterised by a highly diverse urban structure. The city has a varied topography and different neighbourhood types, resulting in significant differences in population and urban density across different areas. These characteristics create diverse conditions for urban mobility and logistics operations, with delivery requirements and accessibility varying considerably between neighbourhoods.

To manage urban freight movements, delivery time restrictions are in place in parts of the city, influencing when deliveries can be carried out. Stavanger has also taken steps towards more sustainable last-mile logistics. In 2020, the city established a city hub supporting cargo-bike-based distribution, creating a local transshipment point from which goods can be delivered using cargo bikes rather than conventional delivery vehicles. The initiative was subsequently expanded in 2023**,** further strengthening the role of the city hub in supporting sustainable urban deliveries.

In addition to the city hub, parcel lockers have been located close to city bike stations and complete multimodal mobility hubs. This creates opportunities to integrate parcel collection with existing

sustainable mobility infrastructure and allows customers to combine logistics-related trips with other journeys made by bicycle or public transport.

3.3.1.2 Replication Assessment

The implementation of the CCNY solution in Stavanger is considered primarily an administrative rather than a political decision. Political support is therefore not expected to constitute a major hurdle, hence the high self-assessment score of 5 out of 5.

A key challenge relates to the differences between Oslo and Stavanger, particularly the higher level of car dependency in Stavanger. Unlike Oslo, Stavanger does not face the same concerns about a lack of parking space, and finding suitable parking locations is therefore less of a challenge. However, this may also affect the success of the CCNY model. In Oslo, the measured benefits come from areas where a large share of residents do not own a car, whereas in Stavanger there is a greater risk that customers would choose to travel by car to a pick-up point.

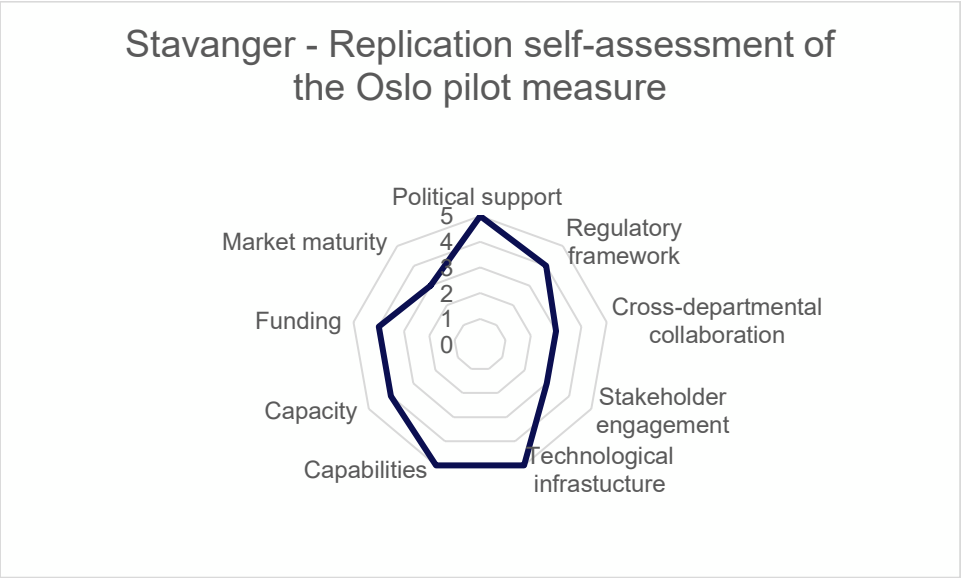
In Oslo, CCNY locations have mainly been placed in city-centre areas characterised by a stronger presence of businesses, as well as in park-and-ride locations. Oslo has also established a response protocol in case residents contact the municipality with concerns about CCNY, although there has so far been little need to use it.

From an organisational perspective, replication should be feasible. In Oslo, the building agency, property agency and planning agency all have an influence on the planning of shops and how deliveries are managed. Stavanger has a broadly similar organisational structure, meaning that the necessary internal collaboration should not be particularly difficult to establish. While there have been some internal discussions about whether such a solution is needed, connecting the initiative to broader city objectives, such as improving efficiency and making better use of public space, can help create support for implementation.

Stavanger already has extensive cooperation with businesses in the city centre, including through the consolidation hub. Communication and engagement with businesses takes place through several different forums rather than through cooperation with a single company. Ideally, retailers would take the initiative and approach the city with the idea. However, implementation of the solution would still require engagement with at least one major company. While this may be manageable for a pilot, engagement could become more complicated if the solution were to be established as a permanent arrangement and opened to broader use, the self-assessment therefore ranks at 3 out of 5.

In terms of resources, implementation would fall within existing responsibilities, although it would still represent an additional workload on top of regular tasks. The solution is expected to require limited funding, and funding is already available for testing the solution, therefore the self-assessment on capacity, capabilities and funding has almost the highest scores between 4 and 5.

Figure 5: Stavanger - Replication self-assessment of the Oslo pilot measure



3.3.1.3 Action Plan

For Stavanger the pilot tested in Oslo could be replicated as such without major amendments to the measure itself. The main hypothesis to be tested compared to the Oslo case would be revolving around the fact that Oslo has less urban density hence the question of the economic viability of such a service. The below table show the implementation steps that the city would follow in order to replicate the measure:

Table 3: Stavanger Replication Action Plan

Step	Timeline	Description of step	Stakeholders involved
1	*Month 1*	*Who starts the conversation? The retailers should reach out to the local authority*	*Local authority and Retailers*
2	*Month 2-3*	*Administrative decision on whether or not to proceed with the pilot implementation (Having the KPIs and results from the Oslo pilot would strengthen the arguments in favour)* *Discussion needed on which / where street space could be used for such delivery option*	*City administration, specific departments (Planning, Traffic Management)*
3	*Month 3-4*	*Definition of locations criteria within the local authority, check whether P+R or multimodal hub spaces could be appropriate*	*Planning department and Traffic Management Department*
4	*Month 4-5*	*Propose and discuss locations to retailers and logistics service providers*	*Planning department and Traffic Management Department*

			Retailer(s)
5	*Month 6-11*	*Test the locations for the operations*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
6	*Month 6-12*	*Measure impacts*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
7	*Month 12*	*Decide on potential long-term implementation based on pilot results*	

The replication process in Stavanger was initiated by IKEA, who establishing contact with the City of Stavanger. An initial meeting was then held with key municipal stakeholders, including key persons working with urban logistics within the administration and representatives from the traffic management department, including the city-centre coordinator. During these discussions, the stakeholders identified an important contextual difference between Stavanger and Oslo: Stavanger is more car-oriented, raising the question of whether customers would be willing to walk or cycle to a pick-up point or whether they would instead choose to travel by car. This was considered an important hypothesis to test in the replication, as customer access mode could influence the overall sustainability of the measure. A further meeting was subsequently held with the department responsible for traffic regulation, which was also positive about testing the solution.

Following these initial discussions, IKEA proposed four potential locations for the replication. The City of Stavanger assessed these locations internally and found that all four were feasible, while identifying one additional potentially suitable location. This assessment was carried out around mid-May and was followed by further discussions within IKEA, including with its local warehouse, to consider the operational feasibility of implementing the measure.

In June, IKEA requested an additional assessment of four new potential locations. The municipality conducted the assessment in August and concluded that at least three of the additional sites were suitable. The municipality is now awaiting feedback from IKEA on whether they wish to proceed with the pilot project

The selected locations were intended to test different urban contexts. One location was situated in a residential neighbourhood, where a mobility hub with a city-bike station and a parking space was already available. Another represented a more car-oriented area, located close to a shopping centre and high-rise residential buildings, and served by a mobility hub combining city bikes and car sharing. The selected locations could also potentially be complemented with additional services, such as glass recycling containers and parcel lockers. The selection of different types of locations was intended to help assess whether the more car-oriented nature of Stavanger would affect the performance and uptake of the measure compared with the Oslo experience.

From a regulatory perspective, it was decided that the Stavanger pilot would not require a dedicated parking-space booking system or a specific regulatory exemption. The selected locations are standard parking spaces within residential parking zones where vehicles can park for up to two hours. Local knowledge and available data also indicated that these spaces are normally available at the relevant delivery times. This differs from a situation in which dedicated or specially regulated parking spaces would be required. In that case, the external company responsible for parking enforcement in Stavanger

would also have needed to be involved. Although Stavanger and Oslo operate under the same national parking regulations, the enforcement arrangements differ, with parking enforcement managed more externally in Stavanger than in Oslo.

The next step is to obtain feedback from IKEA on wether they wish to proceed with the pilot project and recive final approval from the municipal administration. The administration has generally been positive towards testing new solutions. The evaluation is expected to be conducted in-house, using operational data provided by IKEA, with a potential pilot duration of approximately six months. It is important that the test period covers different seasons and therefore provide a more robust assessment of the measure under varying conditions.

3.3.2 Bergen

3.3.2.1 Background information about the city

Bergen is a city of almost 300,000 inhabitants and is currently developing its approach to sustainable urban logistics. A Sustainable Urban Logistics Plan (SULP) is currently in draft form and is expected to be published by 2027, providing a framework for the future development of urban freight and logistics in the city.

Bergen's urban freight infrastructure has also undergone changes in recent years. The freight terminal that were previously located in close proximity to the city centre have been relocated further away, increasing the distance between the main freight-handling facilities and the urban centre. At the same time, the freight railway station has remained in the city centre, maintaining an important freight connection within the urban area.

Against this background, Bergen is also experiencing a significant shift towards electrification of urban delivery vehicles. The uptake of electric delivery vehicles has increased substantially over the past few years, reflecting the broader transition towards cleaner urban freight transport.

3.3.2.2 Replication Assessment

The replicability assessment of the CCNY measure done by the City of Bergen shows more significant challenges when compared to Stavanger.

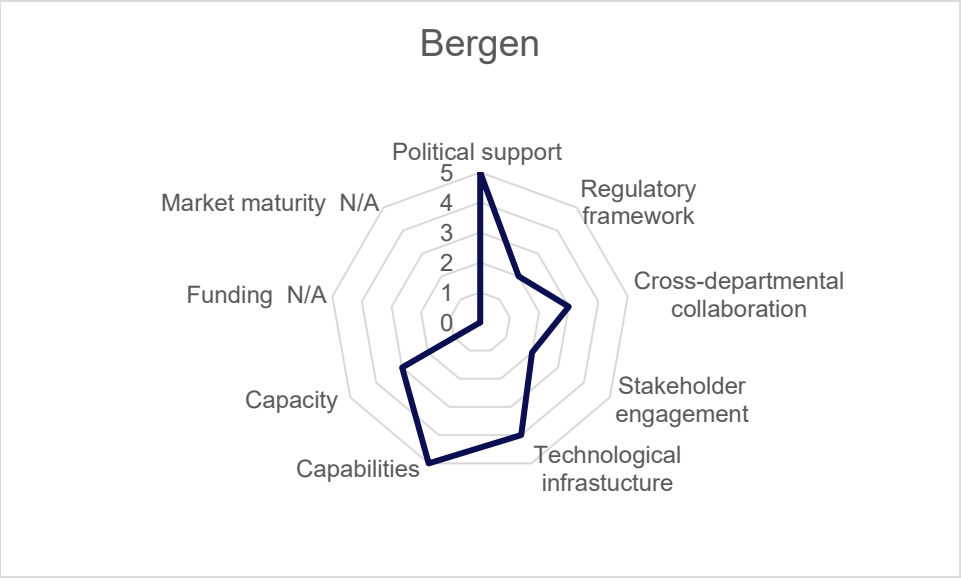
Politicians in Bergen are positive towards business-friendly solutions, hence Political support for such solution would be a given. Yet for the solution to be applicable in Bergen, the use of public space would need to be managed differently from Oslo, in a way that supports access for different users and retailers.

This would require a creative approach enabling a more dynamic use of public space. A key element could be the use of smart parking booking solutions. The necessary technology is already available and in use for parking in Bergen, but it would need to be adapted to delivery zones, which might bring some regulatory challenges. Bergen already has an App for parking and could potentially develop a booking system specifically for delivery zones, meaning that the basic technological framework is already in place.

However, since the use of the public space concerns a commercial activity, replicability should also take into account the business model associated with the use of public space. Ideally, the city should be able to charge delivery companies according to the value of the space in different areas. The key question thus is how much companies would be willing to pay for access to this space. Cross-collaboration, both

internally within the city administration and externally with relevant stakeholders, will require particular attention. The development of a solution that is open to all users will require appropriate stakeholder engagement and coordination, which is why is was rated below average in the replicability assessment.

Figure 6: Bergen - Replicability self-assessment of Oslo Pilot



3.3.2.3 Action Plan

The main concern in Bergen, compared to the pilot deployed in Oslo, is the exclusive accessibility of the delivery spot to a single retailer and LSP. From the perspective of the City of Bergen, the pilot would need to be upgraded to better align with the city's vision for the use of public space. This would entail opening access to the space to multiple retailers and LSPs, rather than reserving it for a specific retailer and LSP.

This would require a more dynamic approach to managing the space where delivery vans can stop. The management of the space would need to be linked to a booking platform and potentially to a fee system, as the city is not willing to provide public space free of charge for private operations. This is reflected in the below Action Plan.

Table 4: Bergen Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1*	*The city should initiate the process given that parking regulation is the main concern to replicate the solution.*	*Local authority and Retailers*
2	*Month 2-3*	*Engage with stakeholders, especially logistics service providers as the solution should be open for everybody*	*City administration, and LSPs and Retailers*
3	*Month 3-4*	*Explore how the city can regulate, especially considering national rules that make the use of dynamic signs in public space challenging*	*Planning department and Traffic Management Department*
4	*Month 4-5*	*Have the regulations approved by the authorities*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
5	*Month 6-11*	*Deploy smart delivery zones where allowed, especially in zones where more consumers can come by foot/bike*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
6	*Month 6-12*	*Share the list of zones in a database available to everyone*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
7	*Month 6-11*	*Test the smart delivery zones*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
8	*Month 6-12*	*Evaluate the measure*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*
9	*Month 12*	*Decide on long-term implementation as well as potential pricing mechanism for the space booking*	*Planning department and Traffic Management Department* *Retailer(s)* *Logistics service provider*

3.4 General considerations about the replicability of the Oslo pilot measures

From the perspective of **private players**, the Click and Collect Near Your model is replicable, as it requires little internal reorganisation, and remains financially efficient for LSPs. However much depends on the urban distribution context as well as the collaboration and willingness of the retailer.

The CCNY model also offers opportunities for replication and diversification of the delivery flows served. Logistics service providers (LSPs) could potentially use the vehicles already operating the service to transport additional types of goods rather than limiting the model to IKEA products. One potential example discussed during the replication workshop was the inclusion of sports equipment and other products that can become relatively large in volume but remain sufficiently manageable for customers to carry from the pick-up point on foot. Combining different delivery flows could increase vehicle utilisation and improve the economic viability of the model. The model could thus potentially be strengthened through joint deliveries involving several retailers or logistics flows. Consolidating different types of orders could increase the volume handled at each pick-up point and improve the efficiency of the service.

Where public space cannot be made available for temporary pick-up points, an alternative could be to use privately owned space. This could provide additional flexibility in selecting suitable locations, although the availability, cost and accessibility of such spaces would need to be considered.

Finally, a possible evolution of the measure would be to explore whether the model could also accommodate larger-sized deliveries. This could involve using a larger vehicle as a mobile pick-up point and would potentially allow a wider range of products to be served. However, this option also introduces a sustainability risk: larger deliveries may increase the likelihood that customers travel to the pick-up point by car, particularly when the goods are more difficult to carry. This could generate additional customer travel and potentially offset part of the environmental benefits achieved through consolidated delivery.

The replicability of the Click and Collect Near You model appears high from the perspective of **public authorities**. However different factors need to be taken into account for European-wide replication. The below Table x summarises the key factors to consider for cities with different characteristics when looking into replicating The Click and Collect Near You model.

Table 5: Replicability factors to consider by local authorities/cities.

Factor	High suitability	Lower suitability / Adaptations needed
Parking regulations	Cities where existing parking regulations allow delivery vehicles to use standard parking spaces without exemptions or regulatory changes.	Cities with strict parking regulations or limited flexibility may require regulatory amendments or a dedicated booking/reservation system.
Parking availability	Areas where parking occupancy is moderate and spaces are generally available during delivery times.	Areas with consistently high parking pressure may require dynamic allocation, reserved loading spaces, or digital booking to ensure reliable access.
Urban density	Medium- to high-density residential or mixed-use neighbourhoods where sufficient delivery demand exists within walking distance of the parking location.	Low-density suburban or dispersed areas may generate insufficient demand, reducing operational efficiency.
Mobility context	Cities with high levels of walking, cycling or public transport use, where reducing van circulation can contribute to sustainability goals.	Highly car-dependent cities may experience lower environmental benefits if customers continue to rely primarily on private cars for collection. Additional measures may be needed to encourage sustainable travel behaviour.
Enforcement capacity	Cities with effective parking enforcement and good knowledge of parking occupancy.	Cities where parking rules are difficult to enforce or where illegal parking is common may face operational challenges.
Municipal willingness	Cities willing to test innovative logistics solutions and collaborate with retailers.	Cities with limited institutional support or reluctance to allocate public space for commercial purposes may require different governance arrangements.

4 Replicating the measures piloted in Utrecht

4.1 Overview the Utrecht pilot measures

The Utrecht Living Lab addresses a specific last-mile delivery challenge in the city's historic inner centre: how to maintain access to customers when conventional delivery vans can no longer reach certain streets. The Municipality of Utrecht is seeking to protect its historic quay walls, many of which are ageing and structurally fragile. Weight restrictions therefore apply to vehicles entering the affected streets. At the same time, a zero-emission zone has been introduced to improve urban liveability and reduce emissions. The combination of these restrictions means that some parts of the city centre are inaccessible even to conventional electric vans, creating a need for alternative delivery models that can operate within these physical and regulatory constraints.

The Utrecht Living Lab focuses on Jumbo grocery home deliveries and tests a mobile micro-hub model that transfers the final leg of delivery from a larger vehicle to smaller, lightweight zero-emission vehicles. This is particularly relevant for grocery logistics, where deliveries involve relatively large and heavy orders, often require temperature-controlled transport, and typically originate from distribution centres located outside the city centre. These characteristics make direct delivery with small vehicles challenging because of their limited capacity and range.

Under the pilot model, a mobile micro-hub consisting of a large electric van travels from the Jumbo depot to a central location in the city. The van acts as a temporary urban consolidation and reloading point. From there, deliveries to customers in the surrounding area are carried out using either a light electric vehicle (LEV) or a bicycle cargo trailer. These smaller vehicles make repeated delivery trips from the micro-hub to customers and return to reload. Once the van has exhausted its stock, it returns to the depot for replenishment before returning to the micro-hub. This operating model enables Jumbo to reach customers in parts of the historic city centre that are difficult or impossible to serve directly with conventional delivery vehicles, while reducing the impact of delivery operations on the surrounding urban environment.

The pilot therefore provides a test case for the replicability of a mobile micro-hub combined with small zero-emission last-mile vehicles as a solution for delivering goods in access-constrained urban areas. The replication assessment can examine the conditions under which this model can be transferred to other cities, including the nature of vehicle access restrictions, customer and delivery density, distances between the depot and the restricted area, the suitability of locations for a temporary micro-hub, vehicle capacity and range, reloading requirements, and the operational feasibility of integrating the model into an existing delivery network.

Communication plays a supporting rather than steering role in the Utrecht pilot. Unlike pilots where customers can actively choose a sustainable delivery option at checkout, Jumbo's delivery vehicle is determined by the delivery address and operational planning. Customers therefore do not make a choice that communication could directly influence. Communication activities are instead intended to inform residents and customers about the pilot and build awareness and acceptance of the new delivery model. This distinction is relevant for replication: the Utrecht case demonstrates that communication measures may primarily serve to support acceptance of a sustainable logistics intervention when the intervention is implemented operationally rather than offered as a consumer choice.

Figure 7: LEV and bicycle cargo trailer deployed in pilot in Utrecht





4.2 Replicability by private actors

4.2.1 Budbee

4.2.1.1 Background information about the company

Budbee, was founded in 2016, together with Instabox, founded in 2015, the company has built a network operating across six countries, with Sweden as its headquarters.

The company employs more than 1,200 people and serves approximately 56 million consumers. Its digital platform has achieved 4.5 million unique app downloads, while its locker network handles more than 5 million deliveries per month.

Budbee follows a 100% locker-focused strategy, consolidating multiple parcels into single delivery points to reduce van movements and congestion in city centers. The company also emphasises a customer-centric approach, providing a convenient and premium user experience designed to encourage consumers to shift from traditional home delivery toward more sustainable out-of-home delivery solutions.

This strategy has shown strong results, with rapid adoption and approximately 80% year-over-year growth, demonstrating a significant shift in consumer behavior. With more than 1,200 active locker locations and over 110,000 compartments across the Benelux region, Budbee has developed a scalable infrastructure that continues to expand.

4.2.1.2 Replication Assessment

The Budbee representative assessed the replicability of the Utrecht measure mainly asking the question whether adding a micro-hub to their operations would be a viable additional step in the delivery chain. The overall assessment shows a moderate replicability level from the perspective of the company. Following specifications were collected regarding the replicability categories.

Regulatory framework: Regulation has a direct impact on Budbee's operations. In particular, difficulties in reaching pedestrian areas require the company to adjust its routes and delivery planning. Zero-emission zones are also pushing the company towards a transition in its delivery operations. At

the same time, Budbee is currently unaware of subsidies that may be available to support fleet adaptation and the establishment of hubs. Greater awareness of available financial support could therefore potentially facilitate the transition.

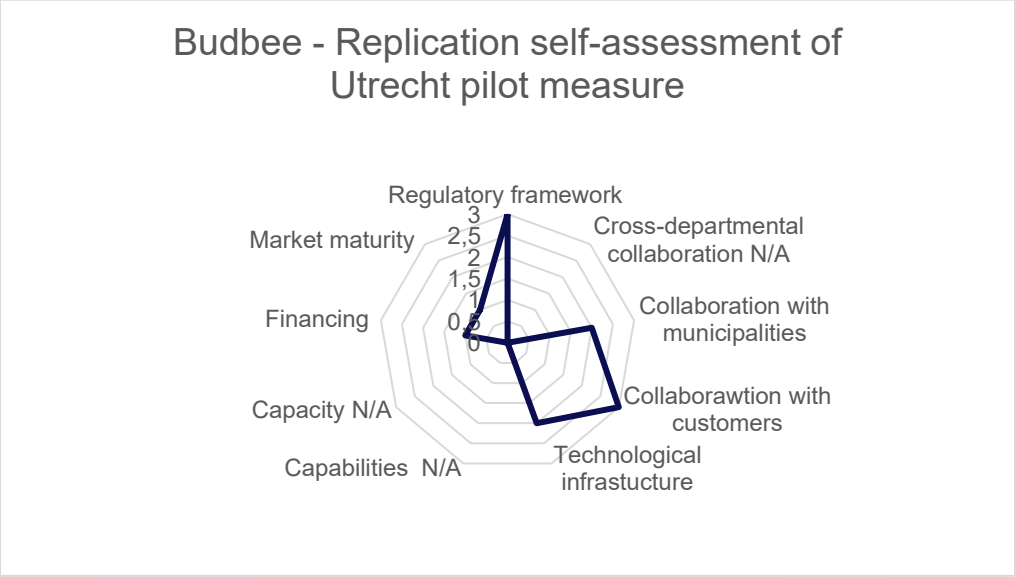
Collaboration with customers and retailers: The last-mile delivery market is highly cost-driven, meaning that customers primarily focus on price. At present, there is also limited demand perceived by budbee from retailers to transition towards more sustainable delivery solutions. Further action would therefore be needed at the customer level.

Collaboration with municipalities and use of urban space: Budbee is already involved in projects with the four largest Dutch municipalities, providing an existing basis for collaboration with local authorities. However, finding suitable locations for lockers remains a significant challenge. The target of installing around 100 lockers is difficult to achieve both in city centres and in peripheral areas due to the scarcity and high cost of available space. In the longer term, this may require different operators to share available space. One possible approach would be to locate lockers outside pedestrian areas, allowing delivery vehicles to avoid entering the city centre altogether. Where hubs are used, both the hub and its surrounding area would need to be appropriately designed. The hub should not be too small, particularly if it is intended to accommodate several operators.

Fleet and operational considerations: Budbee has already made substantial investments in a new electric fleet. This creates limited leverage to justify further investment in other types of light electric vehicles or cargo bikes. Replication of alternative vehicle solutions would require courier partners to be willing to invest in additional vehicle types and to identify suitable drivers to operate them.

At present, Budbee does not use micro-hubs. Parcels are currently sorted into bags and then delivered to lockers. The use of a micro-hub is perceived as an additional operational step and would therefore mainly be justified where it is necessary to access an area using a smaller vehicle. The current transition towards electric vans is also not yet complete across all courier partners. Some partners have not yet transitioned to electric vans and may instead use HVO 100 biodiesel as an alternative.

Figure 8: Budbee - Replication self-assessment of Utrecht pilot measure



4.2.1.3 Action Plan

The company did not see much room for actual implantation of the measure, hence did not come up with a detailed potential action plan. However, during the complementary interview following actionable steps were identified which do not have to be taken in a chronological logic:

Table 6: Budbee Replication Action Plan

Timeline	Description of step and responsible department / organisation	External stakeholders involved
1 month	Verify internally to what extend operating the deliveries with the current fleet (mainly e-vans) would be feasible with stricter city centre restrictions.	*Budbee*
2 months	Eventually assess and discuss where the extra costs of a transhipment point such as a micro-hub would be landing.	*Budbee*
Continuous	Remain open to take part in discussion with city regarding micro-hub projects.	*Budbee, City authority, retailers*

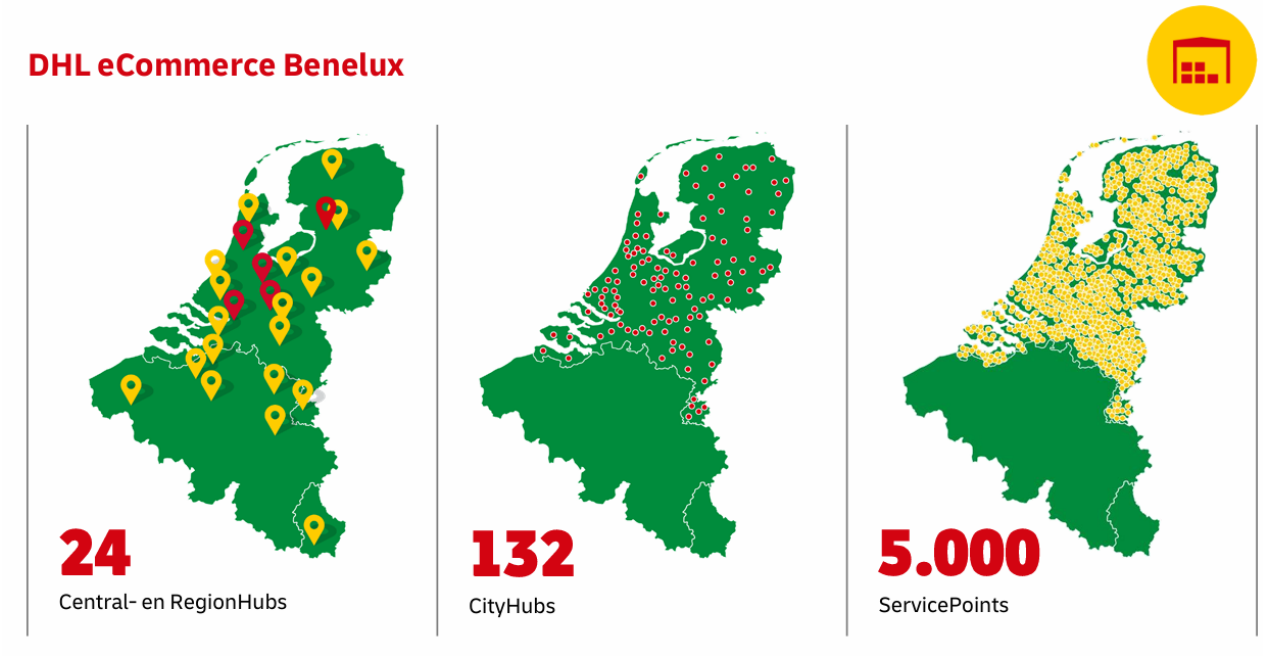
4.2.2 DHL eCommerce

4.2.2.1 Background information about the company

DHL Group is composed by 5 bands, DHLeCommerce was the one taking part in the replication workshop and the CodeZERO study visit. DHL eCommerce focusses on B2B, B2C and C2C. For its operations the company has already developed a tight network of hubs in the Benelux region (see Figure 9). In the Netherlands 20 CityHubs are already operational and 3 are currently under construction. The CityHub network is very dense and in the vicinity of these ZIP codes (maximum 5km distance). In the Netherlands DHL eCommerce does 6,000 rounds and deliver 800K packages per day. Current challenges in Utrecht concern the operation in the pedestrian zone:

- Pickups after 4:00 p.m. are difficult
- Business hours for shops are getting shorter leading to delivery reception challenges
- There is a shortage of loading and unloading spots
- Manoeuvrability of freight routes is suboptimal
- Delivery issues immediately result in a one-day delay

Figure 9: Maps of the DHL eCommerce Hubs in the Benelux



4.2.2.2 Replication Assessment

The overall replicability assessment of DHL for the micro-hub solution deployed in Utrecht is quite high; since almost all company specific criteria rank at 3 or above. Mainly the regulatory framework and market maturity appear as challenging aspects limiting the replication potential. More qualitative details are provided below.

Local context and availability of space: The Utrecht measure would be difficult to replicate for a company alone as a major challenge is the limited availability of suitable real estate, with only very limited space available for efficient operations. The location of the micro-hub is therefore a critical factor. The locations used in Utrecht is not ideal from the DHL perspective partly because of height restrictions for entering the parking garage. The physical characteristics and dimensions of a potential site are essential, as the location would need to meet certain efficiency requirements to be considered by DHL. Its geographical position is equally important: ideally, the micro-hub should be located as close as possible to customers. However, locations that meet this requirement are difficult to find in city centres. The location would also need to provide a safe operating environment, as DHL transports a wide range of goods, from low-value to high-value items, directly to individual homes. In addition, an appropriate electricity supply would be required to enable the charging of LEVs and other vehicles.

Cross-departmental collaboration: There is already significant experience with innovative work within DHL, and teams are in place that could potentially take responsibility for developing and implementing such a solution. DHL also has dedicated teams working on supply chain optimisation and deliveries to inner-city customers, which could take on a project of this nature.

Collaboration with customers and municipalities: There is an opportunity to work with customers through incentives such as discounts. However, the customer remains the key consideration, and there are already certain feedback mechanisms in place. Collaboration with the municipality would be an ideal scenario, although different viewpoints between the municipality and DHL would need to be considered.

Previous innovation pilots have been limited due to concerns about the expected impact of new solutions.

Changing ordering behaviour also remains a challenge. Retailers typically demand specific services from logistics service providers, and if these requirements are not met, they may choose to move to another provider.

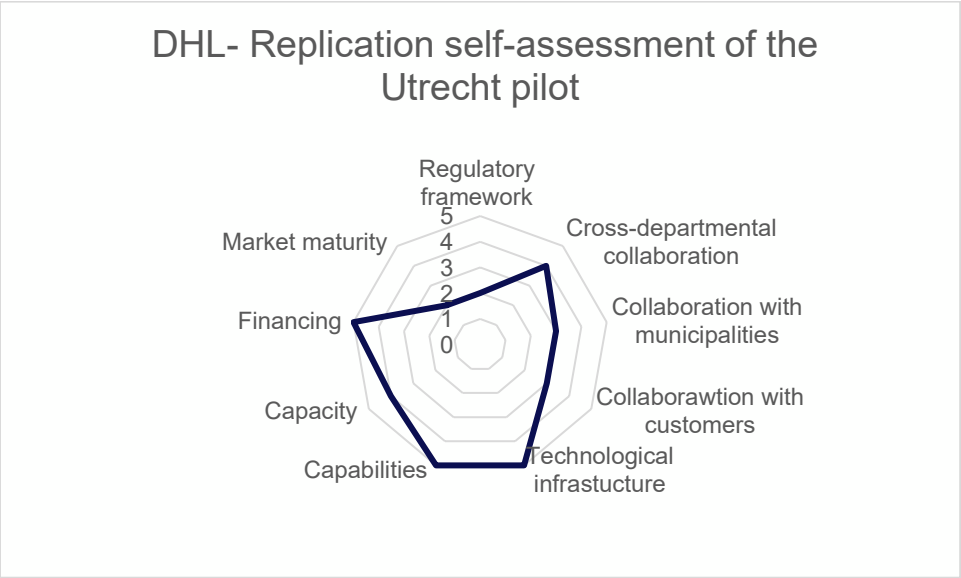
Technological and operational considerations: Cargo bikes are currently considered less effective than DHL's existing delivery-van structure. There is therefore a need for experimentation to understand how existing DHL technologies and operations could be adapted to replicate the Utrecht measure, particularly given the challenges related to operational efficiency. The CodeZERO pilot solution, and particularly the cargo trailer, could nevertheless provide opportunities to support DHL deliveries by foot in pedestrian areas, where access remains an issue. If a micro-hub were to be implemented, transhipment time would be an important consideration. A micro-hub introduces an additional transfer point into the supply chain and may therefore create additional transhipment time that was not previously required. The efficiency of this additional step would need to be carefully assessed.

Capabilities, capacity and financial considerations: DHL has the necessary expertise to develop such a solution, as the company has previously developed similar pilots in other locations. There may, however, be some capacity-related challenges, particularly for drivers when introducing new types of vehicles. Financial resources are available, but the business case would need to be demonstrated for the solution to be implemented. This is particularly challenging for cargo-bike solutions, for which the business case can be difficult to prove.

The market is considered sufficiently mature to support the development of such solutions. However, current e-commerce expectations, such as next-day delivery, make it more difficult to test new delivery models and pilot alternative operational approaches. There are sufficient innovations and technological solutions available to develop measures of this type, but they would need to become more attractive from an operational and business perspective to support wider replication.

Overall, the replication of the Utrecht measure would require careful consideration of the location, operational efficiency, customer requirements and business case. In particular, a suitable micro-hub location would need to be close to customers, provide sufficient space and electricity, allow safe operations and meet DHL's efficiency requirements. Further experimentation would also be needed to determine how the existing DHL delivery structure and technologies could be combined with micro-hub operations, LEVs and cargo trailers in a way that maintains the required level of service.

Figure 10: DHL- Replication self-assessment of the Utrecht pilot



4.2.2.3 Action Plan

The subsequent table provides details on the actions and steps a company like DHL would undertake if it was to engage in the deployment of a micro-hub solution similar to the one tested in the Utrecht pilot. If DHL eCommerce would consider a micro hub in the city centre for serving the pedestrian zone following criteria would need to be met for the hub:

- Centrally located, delivery personal needs to go back several times per day to refill vehicles and accessible (24/7) by (box)trucks for goods delivery / pick up (without lifts)
- From that location operations could be done by:
  - Cargobikes
  - Walkers (for example Nuwiel type of carts)
  - Other LEVV's
- Location needs
  - Toilet
  - Small break room
  - Save storage for goods and vehicles
  - Electricity for charging
- Operations in Utrecht city
  - Mainly store and Servicepoint delivery >10:00 (opening hours stores)
  - Pick up and of business days at stores >16:00
  - Volume indication
    - Full "Singel gebied" 2000 parcels on average day
    - Only pedestrian zone 1000 parcels per day

Table 7: DHL eCommerce Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1-2*	*Define the exact requirements that a micro hub would have to fulfil in order for it to be successful implementation*	*DHL* *Researchers*
2	*Month 3-5*	*Explore potential locations that would be useful as a micro hub location in another city. This will be the most difficult part as the location is essential for a successful business case*	*DHL* *Municipalities* *Real estate agent /developer*
3	*Month 5*	*Explore potential vehicles that could be applied to this specific use case. They have to be efficiently loaded and unloaded and allow to efficiently transport the packages*	*DHL* *Municipality*
4	*Month 6*	*Plan new delivery supply chain this is built around the micro-hub*	*DHL*
5	*Month 7-8*	*Find personnel that is willing to work with smaller vehicles or alternative ways of delivering form the micro-hub (major drawback)*	*DHL*
6	*Month 8-14*	*Test operations*	*DHL, Retailers, Municipalities and or Real estate agent /developer*
7	*Month 8-15*	*Evaluate operations*	*DHL, Retailers, Municipalities and or Real estate agent /developer*
8	*Month 14*	*Assess long term viability of operations and define long-term business model*	*DHL, Retailers, Municipalities and or Real estate agent /developer*

4.3 Replicability by public authorities

4.3.1 Nijmegen

4.3.1.1 Background information about the city

Nijmegen is experiencing continued population and employment growth, putting increasing pressure on the city's mobility network. In response, the city is focusing on making better use of the existing transport network rather than relying on large-scale new infrastructure investments. Its mobility strategy places strong emphasis on sustainable and clean mobility, with measures aimed at encouraging walking, cycling, shared mobility and smart transport solutions, while reducing dependence on private cars. Given the wider regional mobility dynamics, cooperation with surrounding municipalities and regional partners is considered essential to balance accessibility with sustainability.

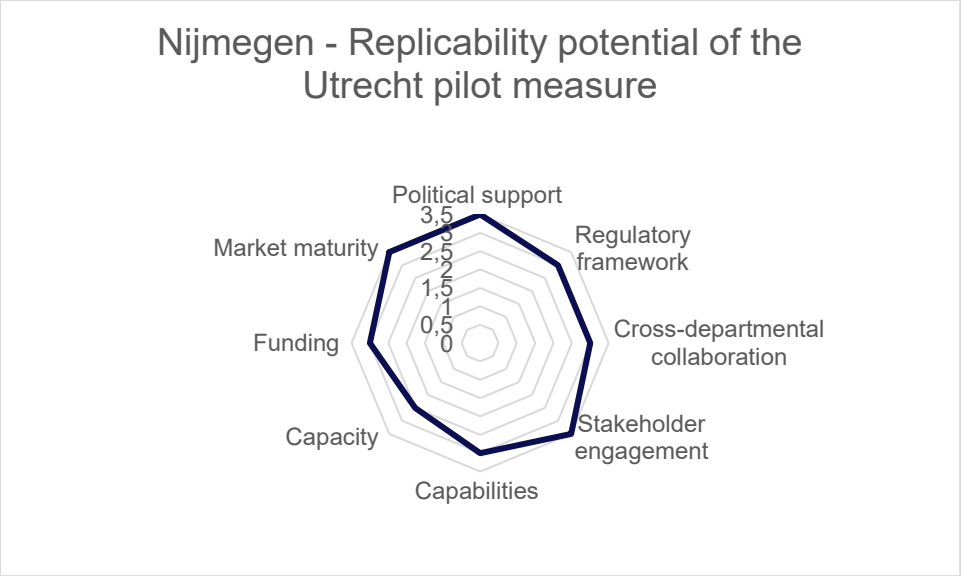
Within this broader mobility context, Nijmegen has already taken significant steps towards the transition to zero-emission urban logistics. The city has established three zero-emission zones for city logistics: the city centre, Hof van Holland and Campus Heijendaal. In parallel, Nijmegen is implementing a low-

traffic zone, further limiting vehicle access in selected areas and creating a need for more sustainable and efficient approaches to urban goods movement.
Nijmegen has also already gained experience with several urban logistics initiatives. One example is Binnenstadservice, which provides a last-mile logistics solution in which goods are consolidated and delivered to final recipients in bundled, zero-emission shipments. The model can also support circular logistics, as vehicles can collect circular materials from recipients on their return journey and bring these materials back to the hub.
Another relevant initiative is Duurzaam Bereikbaar Heijendaal, an area-based approach focused on improving accessibility to the Campus Heijendaal. While logistics is not its primary focus, the initiative provides a relevant framework for considering how mobility, accessibility and logistics can be addressed at area level requiring he collaboration of various institutions.

4.3.1.2 Replication Assessment

From the perspective of the City of Nijmegen, the replicability of the Utrecht pilot is considered above average, with only one of the assessed replication dimensions receiving a score of 2.5 out of 5.
Nijmegen does not currently have the same level of urgency regarding the issue as Utrecht does. Nijmegen's city centre has wider streets; there is competition for space, yet it is less intense than in Utrecht. Consequently, there is less political sense of urgency to take action on logistics, and the issue is left more to the market to address.

Figure 11: Nijmegen - Replicability potential of the Utrecht pilot measure



4.3.1.3 Action Plan

In Nijmegen even though there is an above average replicability potential across all categories, the city seems to have no clear intention to play central role in the management of a micro-hub. As the market is also moving independently the city would favour maintaining a promotional and connector role for such solution. Following action plan was proposed.

Table 8: Nijmegen Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1*	*Engage with companies and shops as well as online shops to assess interest*	*City administration, Retailers, LSPs*
2	*Month 2-3*	*Collect data on their urban logistics needs*	*City administration, and LSPs and Retailers*
3	*Month 3*	*Define what needs there are and what opportunities there are for implementing a micro hub solution* *There is an in-house knowledge on spaces that could be used* *for logistics – could facilitate finding hub space if needed* *Study need for micro-hub vs. Use of existing larger hub at the outskirts*	*City administration, and LSPs and Retailers*
4	*Month 4-5*	*City support space finding for hub*	*City administration*
5	*Month 6-11*	*City supporting promotion of hub and connecting stakeholders yet no direct involvement in hub operations.*	*City administration*
6	*Month 6-12*	*Evaluation of the measure.*	*City administration with other partners involved*
7	*Month 13*	*Assess long-term follow-up*	*City administration with other partners involved*

4.3.2 Den Haag

4.3.2.1 Background information about the city

The Hague city is growing rapidly. The Hague's 2026 population is estimated at 890,068 with an annual growth rate of 0.9% in the last years. Many new homes, residents, and businesses are being added. This also means more trucks, vans, and delivery services on the streets. If no action is taken, the city risks coming to a standstill. That is why The Hague aims to make the transportation of goods more efficient, cleaner, and safer. The Hague presented the Urban Logistics Action Programme 2026–2030, a package of measures designed to reduce the growing logistical pressure on the city.

Measures are already being implemented in various parts of the city. For example, the municipality will start a trial this year in the Fahrenheitstraat and the Denneweg, where companies will soon be able to reserve loading and unloading areas via an app. This will help prevent trucks from standing still in busy locations, for example during the morning rush hour when many children are cycling to school.

The municipality is also working with shopkeepers and residents on a plan for the Denneweg to bundle deliveries more efficiently. From now on, catering businesses will receive their orders via one route rather than from five different suppliers. This will reduce the number of trips and the amount of clutter

on the street. In addition, a trial with a parcel locker in the bicycle shed will be launched, reducing the number of times vans need to visit residents' doors.

The municipality is also examining whether greater use can be made of transport by water. Through the 'Save the Quays' project, the municipality is working with the Province of South Holland to investigate which materials, such as construction waste or sand, could be transported by boat instead of by truck. The project is also examining which quays are suitable for loading and unloading this type of transport. This would, in turn, free up space on the roads.

4.3.2.2 Replication Assessment

The replication assessment in Den Haag focused on the conditions under which the Utrecht micro-hub solution could be transferred to the local context.

Political and regulatory framework: There could be political support for replicating the Utrecht micro-hub measure in Den Haag, but this would likely depend on the solution being presented as a mixed-use location. Urban space within the city is valuable and scarce, and logistics would therefore need to be combined with other uses. One possible approach would be to integrate the micro-hub into a shared mobility hub. The regulatory framework itself is not considered the main barrier to implementation; there is an Urban Logistics Action Programme. Rather, the key challenge is the availability of suitable space. Den Haag already has experience with several micro-hub solutions, providing relevant experience for assessing and developing such a measure.

Cross-departmental collaboration and capacity: Den Haag has the necessary cross-departmental collaboration structures, although responsibilities and expertise are spread across a number of different departments. This could make coordination more complex, but the relevant capabilities are available within the municipality. There is also relevant in-house experience, as well as experience from previous micro-hub solutions. Sufficient internal capacity appears to be available, although there is currently no dedicated team specifically assigned to this type of solution.

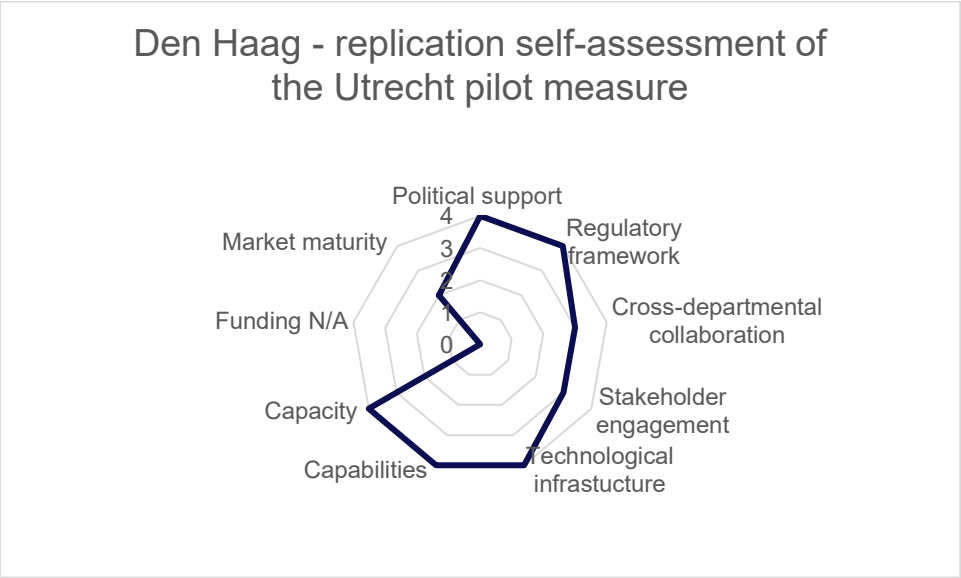
Business case and market conditions: Technology is not considered the main issue for implementation. The key challenge is developing a viable business case and demonstrating benefits for both the commercial parties involved and the municipality. The market is considered sufficiently mature to support such a solution, but the business case would still need to be clearly established. In addition, logistics is generally not the first use considered when identifying suitable locations for urban facilities, meaning that logistics would have to compete with other potential uses of available space.

Availability and suitability of locations: There are several locations in Den Haag city centres that could potentially be suitable for this type of project. In particular, various public assets and buildings are only used during certain periods of the year or certain times of the day, potentially creating opportunities for more flexible and shared use of space. Other potential locations include bus stops, which could potentially be used for parcel storage, and P+R locations, which could function as hubs or parcel pick-up points for customers collecting parcels on their way home. Safety is an important requirement when identifying suitable locations, particularly if the solution is to be replicated in areas that are less safe. At the same time, obtaining approval from local government for the use of such locations can be difficult, as there are often several alternative uses that are considered a higher priority before space is allocated to logistics

Accessibility and shared use of public space: If a public location is made available to a specific company, there would be a need for the location to be white-label and openly accessible. However, this

creates a potential tension with the interests of individual companies, which may be less willing to use or invest in a location if it is openly accessible to other operators.

Figure 12: Den Haag - replication self-assessment of the Utrecht pilot measure



Overall, the main replication challenge for Den Haag is therefore not the technology or regulatory framework, but rather the competition for scarce urban space and the need to develop a business model that provides sufficient value to both public and commercial stakeholders.

4.3.2.3 Action Plan

The following action plan would result if the city of Den Haag was to replicate a solution as Utrecht.

Table 9: Den Haag Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1*	*Engage with companies and shops as well as online shops*	*City administration, Retailers, LSPs*
2	*Month 2-3*	*Collect data on their urban logistics needs*	*City administration, and LSPs and Retailers*
3	*Month 3*	*Define whether micro-hub would respond to specific market needs in relation to access restrictions that are in place.*	*City administration, and LSPs and Retailers*
4	*Month 4-5*	*City support space finding for hub, negotiations with other departments over spaces available and priority uses*	*City administration (several departments)*
5	*Month 6-11*	*City supporting promotion of hub and connecting stakeholders yet no direct involvement in hub operations.*	*City administration*

6	*Month 6-12*	*Evaluation of the measure.*	*City administration with other partners involved*
7	*Month 13*	*Assess long-term follow-up*	*City administration with other partners involved*

4.3.3 Eindhoven

4.3.3.1 Background information about the city

Eindhoven is experiencing significant population and economic growth. The city is expected to reach around 300,000 inhabitants by 2030**,** with growth continuing towards 2040. This development is expected to bring approximately 72,000 additional jobs and 62,000 new homes, around half of which will be located within the city's Ring. This growth will generate increased demand for the movement of goods, as more residents, businesses and construction activities require reliable deliveries and logistics services.

This creates a particular challenge for the city: how to accommodate growing logistics activity while making efficient use of increasingly scarce urban space. Without further intervention, urban logistics movements are expected to increase by almost 20% over the next ten years, adding pressure to the city's streets and public space.

To address this challenge, the Municipality of Eindhoven has developed a Sustainable Logistics Implementation Framework**,** setting out how the city intends to manage logistics growth while maintaining an accessible, healthy and liveable urban environment. The framework looks towards 2050 and aims to ensure that logistics and entrepreneurship can continue to operate effectively within the city while contributing to broader sustainability and mobility objectives.

The framework builds on previous initiatives, including the Green Deal City Logistics 2021–2025, which focused on cleaner commercial vehicles and reducing unnecessary journeys. Since then, the municipality has worked with logistics partners to build knowledge and experience around sustainable urban freight. The Mobility Master Plan adopted in 2024 provides an additional strategic foundation, setting out a vision for mobility that is safe, clean and efficient for all.

Eindhoven's approach therefore seeks to move beyond simply reducing the environmental impact of individual vehicles. It combines urban planning, mobility management, vehicle transition and cooperation with logistics stakeholders to manage the growing demand for freight while ensuring that logistics remains an integral and well-functioning part of the future city.

4.3.3.2 Replication Assessment

Overall, the assessment conducted by an Eindhoven representative indicates a high potential for replicating the Utrecht measure in Eindhoven. The measure received a score of 3 or above across all assessment categories, suggesting that there are no major structural barriers to its implementation and that the necessary conditions are broadly in place.

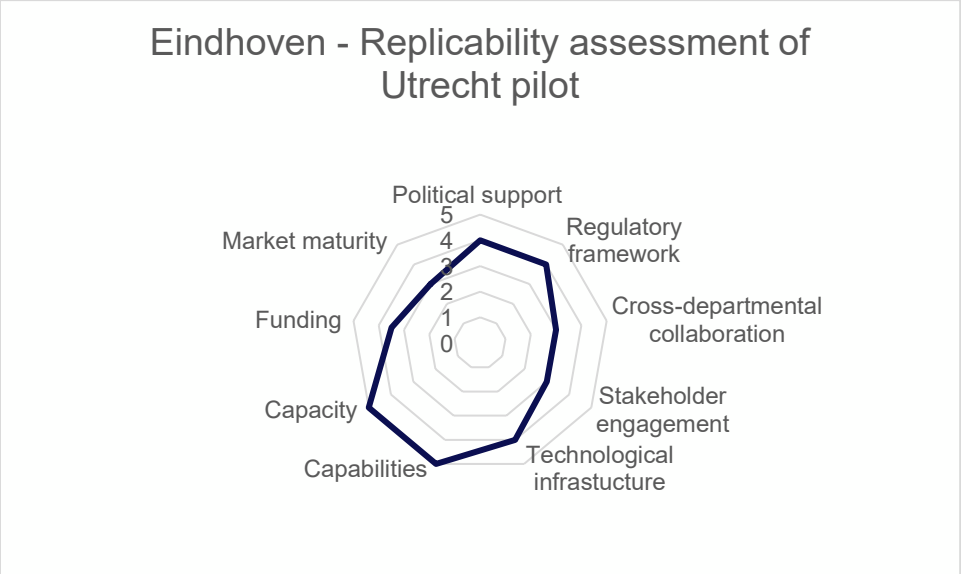
However, some market-related opposition or concerns could be expected. Changes to the organisation of urban logistics may affect existing business models and require companies to adapt their operations. Engagement with logistics operators and other market stakeholders would therefore be important to understand potential impacts and build support for implementation.

From a regulatory perspective, Eindhoven already has several relevant foundations in place. The city has a Sustainable Urban Logistics Plan (SULP) and previous experience with construction consolidation hubs, providing both strategic experience and practical knowledge that could support the development of a new hub. The city also has relevant expertise within its administration. A dedicated position is now focused on logistics, with the possibility of drawing on expertise and support from colleagues in other departments. This provides a useful institutional basis for developing and managing a hub.

At the same time, implementation would require significant cross-departmental cooperation. Establishing a logistics hub would involve not only the logistics and mobility teams, but potentially also departments responsible for public space, urban planning, housing, economic development and other relevant areas. This is particularly important because the allocation of public space in Eindhoven is highly contested. Space for logistics has to compete with other priorities, notably housing and other urban functions, and logistics may not always be considered a priority when decisions on public space are made.

The availability of funding provides some support but also represents a limitation. SULP-related funding is available, although the resources are limited. Additional funding may therefore be required to develop infrastructure or support implementation. Funding is also available for data collection and research, which could help the city assess demand, identify suitable locations and monitor the performance of the measure. However, larger investments, including potential support for electric vehicles or other fleet-related measures, may require access to national funding programmes or other external sources of finance.

Figure 13: Eindhoven - Replicability assessment of Utrecht pilot



4.3.3.3 Action Plan

Following steps were identified if the city of Eindhoven was to develop a micro-hub like Utrecht.

Table 10: Eindhoven Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1*	*Engage with companies and shops as well as online shops engaged through the SULP*	*City administration, Retailers, LSPs*
2	*Month 2-3*	*Collect data on their urban logistics needs*	*City administration, and LSPs and Retailers*
3	*Month 3*	*Define whether micro-hub would respond to specific market needs/market segements in relation to access restrictions that are in place. The city can draw also lessons learned from the construction consolidation hub.*	*City administration, and LSPs and Retailers*
4	*Month 4-5*	*City support space finding for hub, negotiations with other departments over spaces available and priority uses*	*City administration Circularity department, Healty & Physical Environment, Economic Affairs, Mobility.*
5	*Month 6-11*	*City supporting promotion of hub and connecting stakeholders yet no direct involvement in hub operations. With development of new areas such as the station area (Fellenoord), the city could look into efficient use of limited space and hub options with city involvement, as is the case in Merwede Utrecht.*	*City administration*
6	*Month 6-12*	*Evaluation of the measure.*	*City administration with other partners involved*
7	*Month 13*	*Assess long-term follow-up*	*City administration with other partners involved*

4.4 General considerations about the replicability of the Utrecht pilot measures

From the perspective of logistics operators, the replicability of micro-hubs as the one implemented in Utrecht depends heavily on their ability to create operational efficiencies without introducing significant additional costs. A key challenge is that transhipment is often perceived as synonymous with extra cost, as each additional handling step increases complexity, and delivery times.

The location of the hub is therefore one of the most critical success factors. The experience of Utrecht illustrates this well: the hub is strategically located close to the city centre, where restrictions on vehicle access and weight limits make traditional delivery methods less attractive and, in some cases, impractical. Under these conditions, switching to alternative delivery models becomes a commercially viable or even necessary option.

Beyond proximity, the design and accessibility of the facility are equally important. Easy access for incoming vehicles, sufficient loading and unloading space, appropriate ceiling height, and minimising time losses during transhipment operations can determine whether a hub is attractive to operators or not. Several operational considerations also influence replicability:

- Depending on the type and value of goods transported, additional security measures may be required, increasing operating costs.

- For fresh food logistics, deliveries often involve larger volumes and stricter time constraints. In such cases, cargo bikes may not always be suitable, and small electric vans may offer a more practical solution. Whether a micro-hub is needed also depends on whether these vehicles can operate directly from the main depot.

- For companies that primarily use parcel lockers, a micro-hub may represent an additional and potentially unnecessary step in the delivery chain, with limited added value compared to direct distribution models.

Overall, the business case for such urban logistics micro hubs is strongest where access restrictions, congestion, or environmental regulations create clear incentives for operators to shift away from conventional delivery systems. Without such drivers, operators may struggle to justify the additional costs associated with transhipment.

The role of local authorities appears to be primarily focused on establishing an appropriate regulatory framework and ensuring that space for urban logistics activities is strategically planned and safeguarded within the urban area. The extent of municipal involvement in the development and operation of a micro-hub varies considerably from one case to another. In some cities, local authorities play an active role by providing land or facilities, managing the site, and overseeing procurement or tendering processes. In others, their involvement is more facilitative, focusing on stakeholder engagement, coordination, and fostering dialogue between logistics operators, businesses, property owners, and residents.

Table 11: Overall replicability factors to consider by local authorities/cities for the micro hub tested in Utrecht.

Factor	Higher suitability for replication	Lower suitability for replication/adaptations needed
Regulatory framework	Cities with access restrictions, LEZ, ZEZs, pedestrian areas or other regulations that create a need for alternative delivery solutions or vehicle types.	Cities with few access restrictions, where conventional delivery vehicles can reach most destinations directly.
Population & delivery density	High-density urban areas with a high concentration of deliveries, creating sufficient volumes to make a hub economically attractive to LSPs.	Lower-density cities or dispersed delivery patterns, where volumes may be insufficient to generate market interest.
Space availability	Cities where suitable locations for a micro-hub can be identified and where the local authority is willing to facilitate or provide space.	Cities with limited availability of suitable urban space, high competition for space, or limited public-sector support for allocating space.
Public & private capabilities	Cities and companies with sufficient operational capacity and capabilities to implement the model.	Generally, not a major replication barrier, unless local actors lack the capacity to operate or support the hub.
Goods transported	Companies handling goods that can be safely and efficiently consolidated at a hub and transferred to appropriate smaller last-mile vehicles. Small to medium order sizes.	Goods requiring specific handling, security or vehicle characteristics. For example, high-value goods may raise security concerns, while food products may have specific requirements related to vehicles, handling, or order sizes.
Company business model	LSPs with sufficient delivery volumes in a concentrated area and a clear operational benefit or necessity from transhipment and alternative last-mile vehicles.	LSPs with dispersed delivery volumes, big order sizes, limited demand in the target area, or no clear operational benefit and or necessity from introducing an additional transhipment point.

5 Replicating the measures piloted in Antwerp

5.1 Overview the Antwerp pilot measures

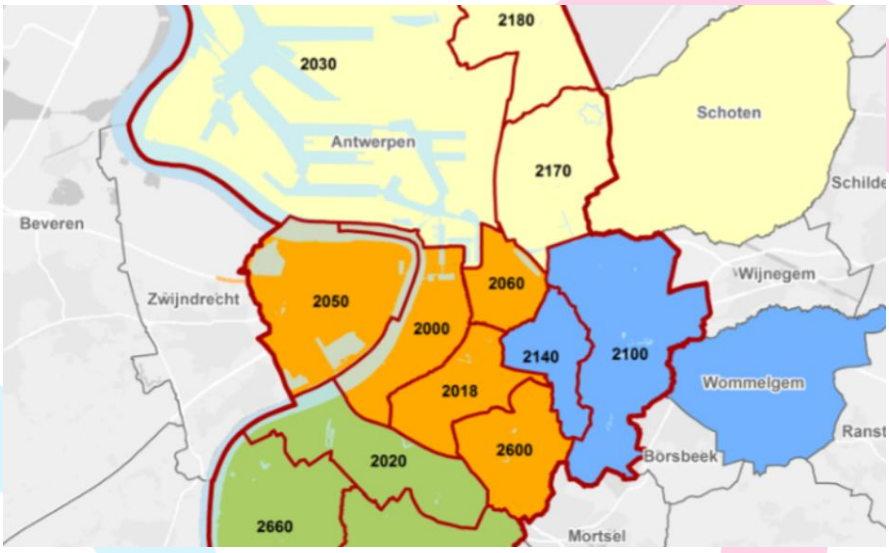
The Antwerp Living Lab addresses the environmental impact of e-commerce last-mile deliveries and, in particular, the high share of deliveries made directly to customers' homes. The pilot brings together the City of Antwerp, Bpost, TORFS and the Mobilise research group at VUB to test how out-of-home delivery options can be made more accessible and attractive to consumers. The underlying premise is that deliveries to consolidated locations, such as Pick-Up and Drop-Off (PUDO) points or retail stores, can reduce the number of individual journeys required to serve dispersed residential addresses and can therefore contribute to more efficient and sustainable last-mile logistics.

The pilot tests a combination of PUDO infrastructure, consumer incentives and targeted communication within a defined urban area covering postal codes 2000, 2018 and 2060. The first component of the intervention is the expansion of the Bpost PUDO network within the pilot area, with the aim of increasing the availability and accessibility of nearby collection points. The pilot then complements this infrastructure measure with communication campaigns and incentive mechanisms designed to encourage consumers to choose an out-of-home delivery option instead of home delivery.

The behavioural intervention focuses on making alternative delivery choices easier and more attractive by encouraging consumers to select nearby PUDO points or delivery-to-shop options, combine parcel collection with trips they would already make, and use walking or cycling to collect their parcels. In this way, the pilot seeks to influence the consumer delivery-choice decision, rather than changing the vehicle technology or routing strategy used by the logistics operator.

The Antwerp pilot therefore provides a test case for assessing the replicability of an out-of-home delivery model supported by expanded PUDO infrastructure and consumer-facing incentives and communication. The replication assessment can examine the conditions required for such a measure to be effective in other urban contexts, including the availability and spatial distribution of PUDO locations, their proximity to consumers and daily activity patterns, the attractiveness of alternative delivery options, the effectiveness of incentives and communication, and consumers' willingness to change their delivery behaviour.

Figure 14: Postcodes of Antwerp and around Source: Stad Antwerpen, 2018



5.2 Replicability by private actors

5.2.1 Les chercheurs d'airs

5.2.1.1 Background information about the company

Les chercheurs d'air is a Brussels-based non-profit association whose origins date back to the Dieselgate scandal in September 2015, which raised public awareness about the gap between official vehicle emission figures and actual pollution levels. In response, a small group of citizens in Brussels began investigating the quality of the air they were breathing. Inspired by similar initiatives in countries such as Germany and Italy, they adopted a citizen science approach, involving volunteers in the collection of air-quality data while following scientific protocols to produce reliable information at a relatively low cost. As public interest in air quality grew, the informal initiative developed into an official non-profit organisation, and Les chercheurs d'air was formally established as an association in 2019. Its work is therefore rooted in citizen participation, scientific data collection, and raising awareness about air quality and pollution in Brussels.

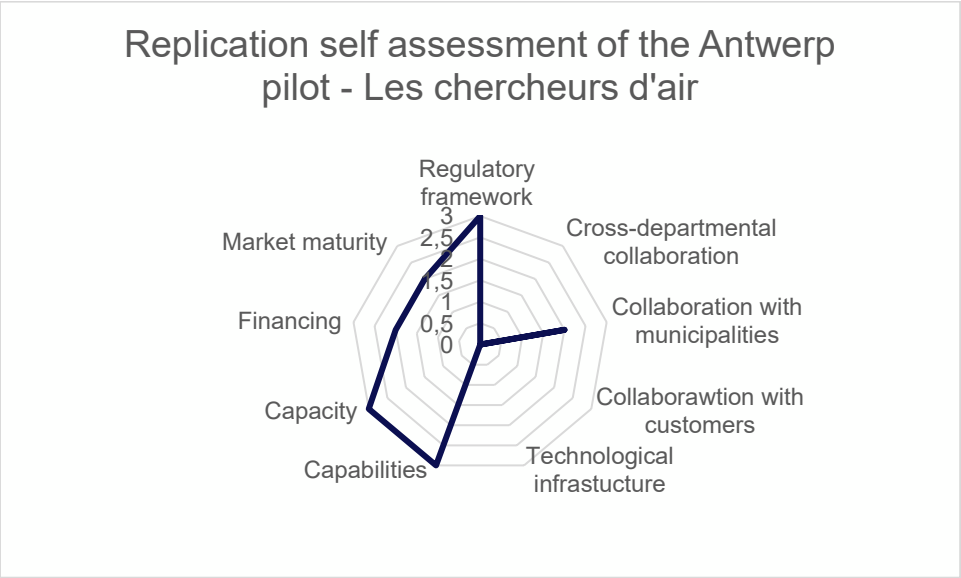
5.2.1.2 Replication Assessment

Les chercheurs d'air looked at the communication campaign and strategy to assess replication. As a small non-for-profit partner organisation some assessment categories such as cross-departmental collaboration, collaboration with costumers and technological infrastructure are not relevant categories to be assessed.

The remaining categories show that the replicability of a communication campaign would overall be moderately feasible under current conditions. The regulatory frameworks in place are currently favourable in the Brussels Capital with a Green Deal for Logistics and a SULP, however little citizen and consumer focus is foreseen in there.

The organisation would rely on external, possibly public funding to engage in such activities. Internal capacities and capabilities are moderately present since the organisation is small and thus needs to prioritise its involvement accordingly. There is an ongoing dialogue with the BCR especially with the administrative level, however the organisation also calls out local politicians whenever they consider their policies to jeopardise the air quality in the BCR. This indicates that a collaboration would need to be on the basis of clear shared objectives if the organisation was to work on this topic with the BCR.

Figure 15: Replication self assessment of the Antwerp pilot - Les chercheurs d'air



5.2.1.3 Action Plan

For Les chercheurs d'air, no full deployment plan was proposed, however following activities could be done with their involvement:

- Campaining and or awareness raising among citizens on the impact on air quality of their online consumption behaviour
- Data collection on logistics impacts on air quality
- Larger citizen focused discussion on sustainable urban logistics practices.

This would be a new thematic area of work for the organisation and would be dependent on public funding to take action. This could happen through the participation in specific funding proposals. Brussels Mobility holds budget for regular campaigns to large audiences and has identified e-commerce as a topic to work on which might be an opportunity to collaborate.

However, compared to the Antwerp pilot a greater involvement of an organisation specialised in engaging citizens could bear the advantage of further leveraging modelling, adapting the communication and engagement of citizens. This might increase the efficiency of the public campaign.

5.2.2 GLS

5.2.2.1 Background information about the company

General Logistics Systems (GLS) is worldwide operating delivery company with its main activity centered on parcel distribution and, in the Benelux region, freight transportation including pallet deliveries. Its parcel business serves both B2B and B2C customers, with an approximate 40/60 split, while out-of-home (OOH) delivery solutions have grown significantly in recent years. In Belgium, GLS operates 12 depots with a fleet of approximately 700 vans, 380 trucks and 270 trailers, supported by around 2,000 ParcelPoints.

These ParcelPoints are used for both last-mile deliveries, either directly or as an alternative same-day delivery option, and first-mile services such as returns. GLS also provides flexible B2C delivery options,

allowing customers to modify their original delivery through alternatives such as delivery to a neighbour, a designated location, or an OOH point, while partnering with BBOX (bnode) for parcel locker solutions. Sustainability is an important focus for the GLS Group, particularly through the electrification of its fleet, with a long-term objective of achieving zero-emission operations by 2045.

In Antwerp, GLS operates across approximately 15 postal codes, using around 20 vans for B2B and B2C deliveries as well as collections from SMEs and OOH locations. Around 50% of these vehicles are electrified, while approximately 70 ParcelPoints support more efficient deliveries. GLS also operates trucks for freight deliveries and trailers for larger collections. To improve efficiency and reduce driving distances, deliveries within Antwerp are supported by a city depot in Deurne, reducing the need for vehicles to travel from the main depot in Puurs, particularly for deliveries in the southern part of the city.

5.2.2.2 Replication Assessment

GLS assessed the replication potential of locker and boutique delivery systems in Belgium as currently limited, citing challenges related to regulatory frameworks, market conditions, customer practices, and access to existing delivery infrastructure. GLS did not rank the replicability.

Regulatory Framework and Collaboration with Municipalities: GLS considered collaboration with municipalities and the current regulatory environment to be suboptimal for supporting broader deployment of alternative delivery models. According to GLS, parcel delivery vehicles are already operating at or near full capacity for both B2B and B2C deliveries. As such, the company does not anticipate that locker-based solutions would significantly reduce the number of delivery vehicles entering urban areas. GLS noted that:

- Delivery vehicles serving cities are generally fully loaded, limiting opportunities to further consolidate deliveries.
- Operational restrictions on larger vehicles imposed by local authorities may require the use of a greater number of smaller vehicles, potentially offsetting efficiency gains.
- In Mechelen, GLS reported operating approximately three fully loaded vehicles per day and indicated that similar utilisation levels are common across parcel delivery operators.
- More targeted or flexible urban access restrictions may be needed to balance urban mobility objectives with operational requirements for parcel delivery services.
- Vehicle weight restrictions present an additional challenge, particularly for electric vehicles, which tend to have higher vehicle weights due to battery systems. According to GLS, this may act as a disincentive for further investment in electric vehicle fleets under the current regulatory framework.

Collaboration with Shippers and Retailers: GLS also identified limited alignment across the supply chain as a barrier to increasing out-of-home (OOH) delivery uptake. Key challenges highlighted include:

- The Belgian market has not yet fully adopted the practice of actively promoting OOH delivery options at checkout, unlike some neighbouring markets where these options are more prominently encouraged.
- Shippers often provide OOH delivery as a free option while charging for alternative delivery choices, but customer awareness and uptake remain limited.
- Many large e-commerce shippers operate outside Belgium or even Europea, reducing the ability to influence their delivery preferences, customer communication strategies, or checkout design.
- Limited transparency regarding the true cost of different delivery methods was identified as a broader issue across the parcel delivery value chain.

- The highly competitive nature of the parcel market leaves transport operators with limited leverage to influence retailer or shipper practices.

Market Maturity and Access to Locker Infrastructure: GLS indicated that the Belgian market is not yet sufficiently mature to justify the development of a proprietary locker network. Instead, the company would likely need to rely on access to locker networks owned and operated by other market players. In this context, GLS identified concerns regarding the openness of existing locker systems and the contractual conditions under which third-party access may be granted. According to GLS, a key consideration is whether shared or white-label locker networks can provide fair and non-discriminatory access for all operators while ensuring equivalent service levels. Questions remain regarding the ability of third-party users to offer the same levels of priority, service reliability, and delivery performance as the owner-operator of the locker network. GLS therefore considers the current conditions for open access to existing locker infrastructure to be insufficiently developed to support widespread adoption of a shared locker model.

5.2.2.3 Action Plan

No specific action plan was proposed by GLS at this stage. GLS noted that existing locker networks do not currently meet the conditions for fair and equitable access across all delivery operators, which would be a prerequisite for an effective white-label approach and replication of the solutions implemented in Antwerp.

5.3 Replicability by public authorities

5.3.1 Bruges

5.3.1.1 Background information about the city

Bruges is a medium-sized Belgian city of around 120,000 inhabitants whose historic medieval centre is designated as a UNESCO World Heritage Site. The city attracts more than 8 million visitors annually, while around 20,000 residents live within the historic core. Its compact urban form, narrow cobblestone streets, and high concentration of shops, restaurants, hotels, and cultural attractions make efficient goods distribution particularly challenging.

To address freight-related impacts, Bruges has already implemented several measures, including delivery time windows for heavy vehicles, subsidies for cargo bikes, and support for bpost's zero-emission ecozone for urban deliveries. These initiatives have helped reduce some of the environmental and operational impacts of last-mile logistics in the city centre.

Despite these efforts, Bruges continues to face significant urban logistics challenges. High volumes of visitors and delivery traffic create congestion, safety concerns, and pressure on public space in the densely populated historic centre. Freight movements remain difficult to manage in the narrow medieval street network, and a previous attempt to establish an urban consolidation hub was unsuccessful due to its distance from the centre, limited business uptake, and lack of supporting regulations. As a result, the city is now exploring new solutions, including the development of a logistics hub in the redeveloping quay district and the preparation of a Sustainable Urban Logistics Plan (SULP) to establish a more comprehensive approach to urban freight management.

However, the City of Bruges is not standing still when it comes to urban mobility. In 2025, Bruges became home to Belgium's largest cycling zone. The city is also actively encouraging residents to apply for cargo bike parking spaces in the city centre and will introduce a new parking policy in February 2027, alongside a doubling of the car-free area, which will henceforth be known as the Destination Traffic

Zone. Through this combination of measures, this city is already taking steps to further reduce traffic pressure in Bruges city centre and actively encourage drivers to shift towards more sustainable modes of transport. In doing so, the city is giving more breathing space to vulnerable road users and continuing our commitment to making Bruges an even more sustainable city centre.

5.3.1.2 Replication Assessment

The replication assessment of Bruges focused on the conditions under which PUDO points and locker boutiques could be transferred to their local context.

Political support: Local politicians in Bruges appear generally favourable towards developments related to urban logistics. This provides a supportive political context for the potential replication of the Antwerp pilot.

Permitting requirements: A permit would likely be required, depending on the specific nature and location of the intervention. One important consideration is how the service is legally classified, particularly in relation to existing categories such as retail or commercial activities. Clarifying the type of service would therefore be important at an early stage.

Location and public-space requirements: The feasibility of replication depends significantly on the location proposed. Ideally, the selected location should already be suitable for the intended activity and should not require significant changes to the public domain in order to comply with permitting requirements. The location should therefore be assessed at an early stage, including its compatibility with existing public-space regulations and surrounding activities. For larger locker installations or similar infrastructure requiring placement on public land, rental or other forms of payment for the use of public space could become relevant. This would need to be assessed on a case-by-case basis depending on the location, size and nature of the infrastructure.

Density considerations: Urban density may be an important factor, particularly for operators such as Bpost, as it can influence the viability and demand for urban logistics infrastructure.

Regulatory framework: The Sustainable Urban Logistics Plan (SULP) is currently under development and is expected to provide a useful regulatory framework for future urban logistics initiatives.

Internal collaboration: There is a good level of collaboration within the city administration on urban logistics. A direct line of communication has been established in relation to the Ecozone, facilitating coordination between the relevant departments. The Ecozone initiative involved collaboration with several municipal functions, including:

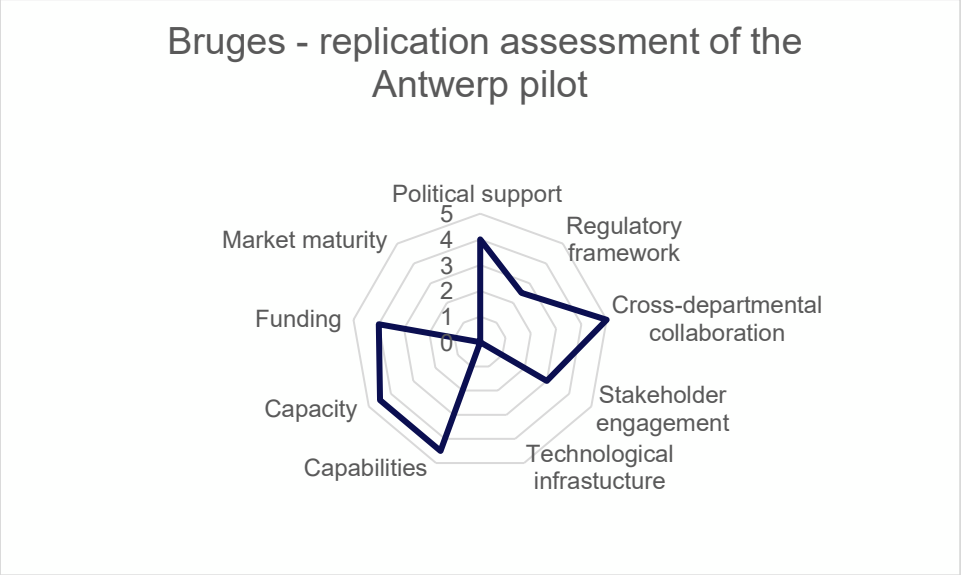
- Permitting
- Tourism
- UNESCO
- Mobility
- Public domain
- Environment
- Police, although the police had a more limited role

This cross-departmental cooperation has also generated internal learning and increased the city's capacity to support similar initiatives in the future.

External stakeholder engagement: The main external stakeholder discussed in relation to the measures was Bpost. Relatively few other stakeholders approached the city directly, and there was limited proactive outreach by the city towards other potential operators or stakeholders. There appears to be significant potential for greater involvement of retailers in future initiatives. For individual shop owners, engagement through the city's economic development department may be more appropriate than approaching them primarily through the logistics or mobility departments.

Financial implications: The financial implications for implementing similar urban logistics solutions are expected to be relatively limited, particularly where existing infrastructure and private or operator-owned solutions can be used.

Figure 16: Bruges - replication assessment of the Antwerp pilot



5.3.1.3 Action Plan

When looking at the replication of the Antwerp pilot in Bruges it is important to recall that lockers have already been implemented in Bruges as part of the Ecozone initiative. Since 2022, 14 locker units, each approximately 1 metre wide, have been installed in the city centre. The implementation was carried out through the relevant permitting process, including a public consultation/investigation. In comparison, Mechelen tested a tendering approach for the implementation of similar locker infrastructure. To date, no other companies have submitted applications to install lockers in Bruges. An important condition attached to Bpost's permit is that its locker system must remain open to other operators. The permit also includes provisions allowing city services to use the system free of charge. However, the technical arrangements required to enable access for both municipal services and other logistics operators are still under discussion.

In addition to the smaller lockers located in the city centre, Bpost also operates larger locker installations, typically between approximately 3 and 7 metres in size, on private land. Any such installation on public land would need to be assessed in terms of permitting, public-space requirements and the principle of market neutrality.

Replication Potential for Bpost Boutiques in Bruges

The concept of a Bpost boutique could potentially also be implemented in Bruges. However, Bpost would need to submit the appropriate permit application before such a facility could be established. At present, Bpost has not approached the City of Bruges regarding a specific Bpost boutique proposal. Following key steps would need to be taken in case of replication:

Table 12: Bruges Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	Month 1	Operator should approach city authority	City permit department, operator
2	Month 1-2	Permit (requires internal discussion as is a new type of activity – often pre-discussion would have happened internally when new trends arise at own initiative of experts within municipality)	Permit department, mobility department
3	Month 3 - 4	Public inquiry around specific location for 30 days – if there are complaints, then further time is needed to review those	Permit department, mobility department
4	Month 4	Decision upon location	Permit department, mobility department
5	Month 5	Installation of the boutique	Operator

5.3.2 Mechelen

5.3.2.1 Background information about the city

Mechelen is a Belgian city covering approximately 6,600 hectares and comprising 12 neighbourhoods and villages, with around 90,282 inhabitants and two railway stations. The city has placed sustainable mobility and urban logistics high on its policy agenda through its Sustainable Mobility Plan (2015), Regional Mobility Plan (2023), and Covenant for Sustainable Urban Logistics (2020). Mechelen aims to achieve a 50/50 modal split and reduce kilometres travelled by 15% by 2030, while also promoting a shift in freight transport towards rail and waterways.

A key objective is to make the city's most important centres emission-free by 2030, including achieving zero-emission deliveries in the city centre. To support this transition, the city has introduced measures such as car-limited zones and bicycle streets, while testing innovative solutions including cycle logistics and parcel lockers. Mechelen also supports collaboration between retailers, logistics providers, citizens, and local organisations through initiatives such as a city hub for retailers, consolidated zero-emission deliveries, public parcel lockers, and an ecozone developed with bpost. The parcel locker and ecozone measure have demonstrated significant environmental potential, including reported CO_2 emission reductions of up to 97%. Between 2018 and 2021 the municipality provided yearly subsidies up to €5,000 to entrepreneurs purchasing cargo bikes.

Furthermore, the city facilitates cooperation through a zero-emission working group and projects involving construction, service logistics, and local businesses, demonstrating an integrated approach to developing cleaner and more efficient urban freight transport.

5.3.2.2 Replication Assessment

The replication assessment of Mechelen focused on the conditions under which PUDO points and locker boutiques could be transferred to their local context. Overall, the measure appears **moderately to highly replicable in Mechelen**, as many of the enabling conditions required for implementation are already in place. The city has prior experience with parcel locker projects, established stakeholder networks, and existing procedures for permitting and location assessment.

Political Support: From a political perspective, replication prospects are generally positive. The concept aligns with previous city policies and projects promoting sustainable urban logistics and parcel delivery solutions. Since parcel lockers are already present in Mechelen, introducing an expanded concept such as an open locker hub or Bbox Boutique would likely be perceived as a natural extension of existing services rather than a completely new intervention. Political support would therefore be expected, although the level of commitment would depend on the required public investment and the availability of municipal budgets.

Regulatory Framework: The regulatory environment is largely favourable because procedures already exist for parcel lockers located in the public domain. Nevertheless, several planning considerations may affect implementation. The suitability of locations varies considerably across the city. In the historic city centre, narrow streets and limited pavement space can make the installation of larger locker facilities difficult. Main commercial shopping streets may also present challenges if planners seek to preserve retail functions and avoid non-retail uses that could undermine commercial vitality. An important consideration concerns the classification of a Bbox Boutique. If such a facility is considered a retail operation, it may fit within existing commercial areas. However, if local planning regulations classify it differently, additional permitting requirements may apply. Residential neighbourhoods may also offer a weaker business case due to lower density levels and lower parcel volumes. As a result, the most promising opportunities may arise in newly planned neighbourhoods or redevelopment projects, where locker hub requirements can be integrated from the outset.

Cross-Departmental Collaboration: Mechelen already has established routines for evaluating and implementing parcel locker projects, which significantly supports replicability. The economic development department would need to assess impacts on local commerce and retail activity. The planning and building departments would need to evaluate the compatibility of the proposed use with the surrounding urban environment. The mobility department would play a particularly important role by assessing vehicle access, loading and unloading arrangements, bicycle parking requirements, and the anticipated travel patterns of users. Given that a Bbox Boutique could generate higher volumes of visits and deliveries than a standard locker wall, a more comprehensive assessment would be required. The presence of existing governance structures, including a zero-emission logistics working group, suggests that mechanisms for interdepartmental coordination and stakeholder dialogue are already available.

Stakeholder Engagement: A major strength for replication in Mechelen is the existence of well-developed stakeholder networks. Relationships with local businesses have already been established through previous sustainable logistics initiatives, creating channels for consultation and co-creation.

In addition, organisations such as *MEST* can provide valuable support by exploring temporary uses of vacant retail properties. Such partnerships could facilitate pilot implementations in underutilised commercial spaces while simultaneously contributing to urban regeneration objectives.

Technological Infrastructure: Technological feasibility is not expected to be a major municipal challenge. The critical issue lies with the operators themselves and the degree to which different

logistics providers can integrate their systems into a shared open locker platform. The success of an open hub model depends on interoperability between operators, shared access arrangements, and compatible parcel management systems. Consequently, technological readiness is largely an external factor rather than a municipal one.

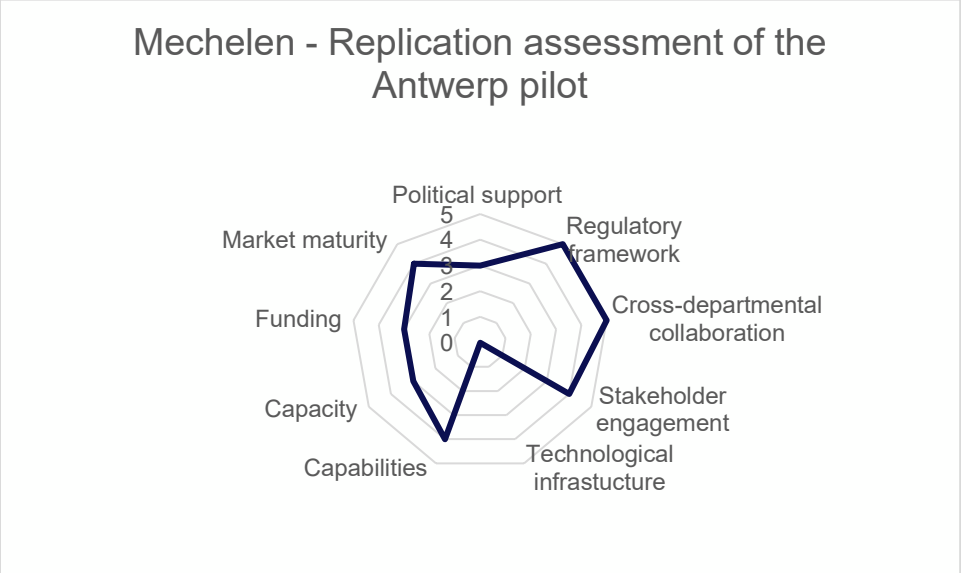
Organisational Capabilities: Mechelen has accumulated relevant expertise through previous urban logistics and parcel delivery projects. This experience provides city staff with a good understanding of stakeholder management, permitting procedures, pilot testing, and communication activities. Such organisational learning reduces implementation risks and supports efficient replication.

Capacity: While knowledge and experience exist, staff capacity remains somewhat uncertain. Sustainable urban logistics has become an increasingly mainstream topic within municipal administrations, but dedicated resources often depend on project-based funding. If no follow-up initiatives are available, capacity levels may fluctuate, potentially slowing implementation and long-term management.

Funding: The financial model also varies according to the location. Where the municipality can provide temporary use of publicly owned space or vacant properties, implementation costs may be relatively limited. In contrast, fully private solutions would depend more heavily on commercial viability and operator willingness to invest.

Market Maturity: Although not explicitly assessed in the stakeholder discussions, market maturity appears to be mixed. Parcel lockers are already a well-established service, demonstrating a mature market for automated parcel delivery. The more innovative aspect would be a shared or open-access hub concept, which requires cooperation between multiple operators.

Figure 17: Mechelen - Replication assessment of the Antwerp pilot



5.3.2.3 Action Plan

From the perspective of Mechelen the effective implementation of the solution would depend on following concrete scenarios:

- Depends whether operators such as Bpost would effectively see the need for such infrastructure
- Depends on area of city operators want to develop such locker boutiques
- Depends on the density and the presence or not of other similar existing services

Table 13: Mechelen Replication Action Plan

Step	Timeline	Description of Step and Responsible Department / Organisation	External Stakeholders Involved
1.	Month 1-3	Evaluate whether locker boutique/PUDO can be implemented as proposed. Assessment should consider the specific city area, population density, and the presence of similar existing services.	Operator
2.	Month 3-5	Determine interest and align expectations. Discussions may be initiated by the operator approaching the local authority, or by the local authority contacting operators, particularly in the context of new area development or redevelopment projects. When existing locker contracts or tenders are revised, consider including boutiques.	Bpost, local authority, locker operators, developers
3.	Month 5-6	Assess location availability and suitability. Consider public versus private locations and accessibility requirements. Responsible departments include spatial planning, urban development, and asset management teams.	Property owners, developers, shop owners, locker operators
4.	Month 6-7	Determine permitting requirements, particularly where parking implications exist. For private locations (e.g., shops), follow standard permitting procedures. Responsible departments include permitting and mobility/parking departments.	Property owners, shop owners, local permitting authorities
5.	Month 7-8	Finalise agreements regarding operation, location use, maintenance responsibilities, and access arrangements. Responsible departments vary depending on ownership and permitting requirements.	Local authority, operators, property owners
6.	Month 8-15	Promote the service and location to residents and businesses. Communication with shop owners can help increase awareness. Cities can support promotion through press releases, and announcements by the responsible alderman/councillor.	Shop owners, local businesses, city communication teams, alderman for economy, media

5.3.3 Brussels Capital Region

5.3.3.1 Background information about the city

The Brussels-Capital Region (BCR) covers approximately 160 km² and is home to around 1.2 million inhabitants. The region has implemented several policies to address urban mobility, emissions, and sustainable logistics, including a Regional Mobility Plan, Low Emission Mobility Plan, and Green Deal for Urban Logistics. Since 2018, Brussels has operated a Low Emission Zone (LEZ), enforced through ANPR cameras, with fines of up to €350 for non-compliant vehicles. Restrictions are becoming

increasingly stringent, including the recent ban on Euro 5 diesel cars, vans and trucks, as well as Euro 2 light vehicles, while full diesel phase-outs are planned for cars by 2030 and vans by 2035.

At the same time, the region is introducing monthly and yearly passes to make the LEZ more accessible to the public, while maintaining the existing LEZ timetable. In addition to regulatory measures, Brussels is actively promoting sustainable urban logistics through the Brussels Green Deal**,** a collaborative platform involving 88 public and private stakeholders. The initiative supports innovative solutions from frontrunners to decarbonise freight and promote knowledge exchange and replication.

THE BCR has been testing innovative solutions such as nano-hubs, micro-hubs, cycle logistics, construction consolidation centres, multimodal terminals, and grouped deliveries**.** These initiatives demonstrate Brussels' commitment to reducing urban freight emissions and congestion while developing more efficient and sustainable last-mile delivery systems.

5.3.3.2 Replication Assessment

The Brussels Capital Region assessed the replicability of the communication campaign deployed in the Antwerp Pilot.

Political support is there in principle, but commitment remains uncertain as current budget constraints limit the scope for new awareness raising and communication initiatives. The platform created through the Green Deal continues to exist and provides opportunities to test logistics solutions. However, significant financial constraints limit the ability to develop new initiatives. Considerable effort is currently focused on maintaining existing Green Deal budgets, leaving little room for additional measures such as communication or awareness campaigns.

Regulatory Framework: Brussels has a relatively strong regulatory framework supporting sustainable urban logistics. The Low Emission Zone (LEZ) acts as a key regulatory driver, with cars and vans required to be 100% electric by 2035 to access the city centre. The Green Deal for Urban Logistics provides a network of pioneers and supported by Secretary of State for the Environment, the Mobility Minister and the Minister of Employment and Economy. In addition, Brussels Mobility already runs mobility-related awareness campaigns that could provide useful experience and channels for future activities.

Cross-departmental collaboration is well established. Key actors involved include the Port of Brussels, Brussels Environment, Brussels Mobility, Brussels Economy and Employment, citydev.brussels who cooperate within the Green Deal, among other projects Brussels Capital Region mainly acts as a facilitator, bringing together stakeholders, but it can also implement communication or awareness campaigns on priority topics, such as to inform drivers of a new restriction under the Low Emission Zone. Retail associations and e-commerce platforms, such as Comeos, are expected to play an important role in campaign delivery. Local municipalities also contribute through their responsibilities regarding permits.

Stakeholder Engagement: Brussels benefits from a strong stakeholder network, although engagement with the retailers' association Comeos would need to be reactivated. Earlier initiatives, such as the SmartDrop project developed with VUB, focused on helping consumers choose more sustainable delivery options. TORFS has expressed interest in promoting the concept to other retailers and could potentially present the initiative during a future Comeos meeting, providing an opportunity to engage additional market actors.

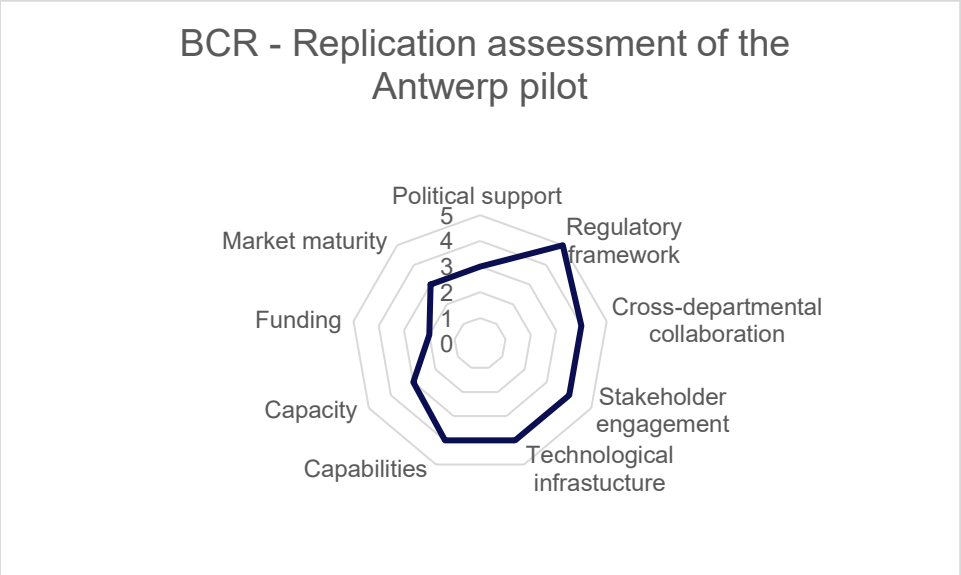
Technological Infrastructure: The region has significant potential due to its existing and dense network of pick-up and delivery points (PUDOs). Similar to Antwerp, Bpost operates an extensive network of collection and delivery locations across Brussels and has established several "Boetik" concepts comparable to those visited during the Antwerp replication workshop. Research conducted by VUB indicates that around 70% of e-commerce deliveries are still delivered directly to homes, suggesting substantial room for shifting demand towards more sustainable delivery alternatives.

Capabilities and capacity: The necessary expertise and knowledge are available in-house within the organisations involved, providing a solid basis for implementation and coordination. Capacity is constrained by staffing limitations. There is currently no possibility to recruit additional personnel to support the initiative.

Funding: Funding availability is a major challenge and is thus having a low score of 1 out of 5. While communication activities could potentially be implemented at relatively modest cost (for example, a promotional video produced in Antwerp cost approximately €4,000), there is currently no dedicated budget available for similar activities or open calls in Brussels.

Market Maturity remains limited and is scored 2 out of 5. Although TORFS has shown interest and willingness to promote the campaign based on its experience in Antwerp, the retailer is not active in the Brussels market. Therefore, additional retail partners with a strong presence in Brussels would need to be identified and engaged to create sufficient market momentum and ensure the success of a consumer-facing awareness campaign.

Figure 18: BCR - Replication assessment of the Antwerp pilot



5.3.3.3 Action Plan

Participants form the BCR to the workshop highlighted that if funds were to be found for such campaign, then following implementation steps would be undertaken.

Table 14: Brussels Capital Region Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1-3*	*Getting stakeholders on board with a coalition of the willing*	*Regional administration (Bruxelles Environnement and Bruxelles Mobilité, Comeos + TORFS (to share experience) + green deal working group, Logistics Service Providers (LSPs) bpost, Mondial Relay, GLS, etc.*
2	*Month 2-3*	*Defining the objective of the campaign and the target group.*	*Regional administration, and LSPs, such as bpost and Retailers*
3	*Month 3*	*Select the channels to be used to reach the target group*	*Regional administration, and LSPs and Retailers*
4	*Month 4-5*	*Finetune the campaign per channels.*	*Regional administration*
5	*Month 6-11*	*Campaign*	*Regional administration, and LSPs and Retailers*
6	*Month 6-12*	*Evaluate the campaign*	*Regional administration, and LSPs and Retailers, research partner (VUB).*
7	*Month 13*	*Decide on follow-up*	*Regional administration, and LSPs and Retailers*

5.4 General considerations about the replicability of the Antwerp pilot measures

Two main distinct measures developed in the Antwerp Pilot were assessed for their replication potential:

- Communication initiatives targeting citizens, led by local authorities and potentially supported by other actors such as associations.
- The use of parcel lockers and locker boutiques by logistics service providers and retailers.

Replicability of the communication campaign

- Political commitment, funding, and budget allocation for this type of initiative can be difficult to secure, particularly in times of budget constraint.
- Communication on urban logistics is often not perceived as an essential policy priority.
- However, there is potential when such campaigns are developed collectively by local authorities, citizen engagement organisations, logistics service providers, and retailer associations jointly.
- Retailers, as the actors closest to consumers, have a significant role to play. However, engaging them can be challenging, particularly given the growing share of online retailers operating from outside the EU. In practice, EU-level regulation may be the only effective mechanism to encourage these actors to adopt communication and checkout practices that support sustainable delivery choices.

Lockers and locker boutiques

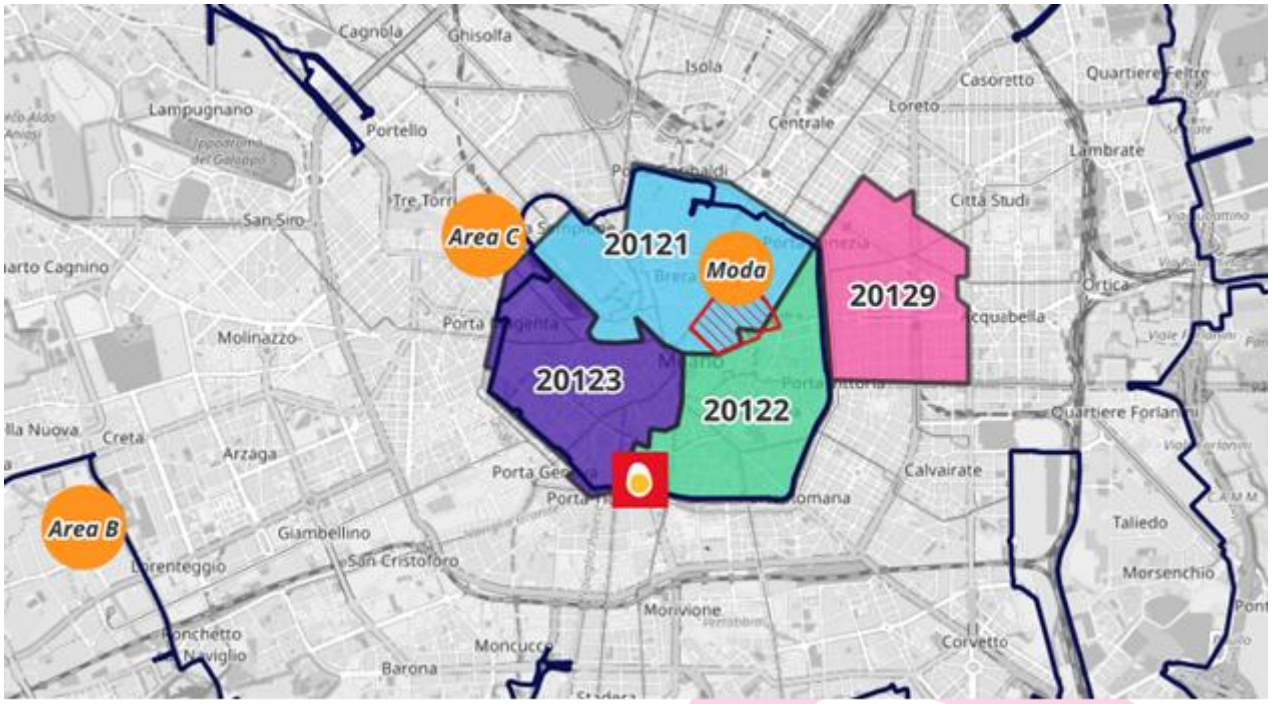
- From a public policy perspective, open-access locker networks represent the ideal scenario. However, the replication assessment indicates that this remains difficult to achieve. Locker markets are increasingly consolidated, and logistics service providers often have limited incentives to open their networks to competitors. As a result, supposedly open systems may still exhibit disparities in accessibility between operators.
- Locker boutiques require sufficiently high parcel volumes to be economically viable, as they involve higher costs than traditional locker walls. Their deployment is therefore more dependent on business case considerations. In addition, planning and permitting regulations play a central role and can vary significantly across locations, affecting the ease with which such facilities can be implemented across European cities.

6 Replicating the measures piloted in Milan

6.1 Overview the Milan pilot measures

The pilot is implemented in Milan, a dense and complex urban logistics environment characterised by high levels of commercial activity, strong e-commerce demand, intense competition for curbside space, and access regulations that directly affect last-mile delivery operations. The pilot takes place within a regulatory context that includes several access and mobility restrictions across the city centre and inner districts, notably Area C (congestion charge), Area B (low-emission zone), and additional Limited Traffic Zone (LTZ) rules in sensitive areas such as the Quadrilatero della Moda. At the same time, e-commerce represents a significant share of urban deliveries, while the limited availability and frequent misuse of loading and unloading bays create considerable operational pressure for logistics operators. This combination of high delivery demand, constrained curbside capacity and regulatory restrictions provides the specific urban context in which the Milan pilot is implemented and tested.

Figure 19: ZIP codes invested by the pilot, So.De. hubs and access regulation perimeters



The Milan Living Lab tests the use of a higher-capacity boxed cargo tricycle as a last-mile delivery measure within IKEA home-delivery operations operated by So.De Social Delivery. The pilot compares two cargo-bike fleet configurations under comparable operating conditions: (1) a standard fleet composed exclusively of Long John cargo bikes and (2) a mixed fleet combining Long John cargo bikes with a higher-capacity boxed cargo tricycle. The purpose of this comparison is to assess whether introducing a higher-capacity vehicle into an existing cargo-bike delivery operation can improve overall fleet performance and make more efficient use of available vehicle capacity.

In particular, the pilot examines the potential of the tricycle to consolidate more loads per route, reduce kilometres and working hours per delivered unit, and increase vehicle utilisation, including through the co-loading of IKEA deliveries with parcels from other So.De clients. The pilot therefore provides a concrete test case for assessing the replicability of integrating higher-capacity cargo vehicles into urban

last-mile delivery fleets, and the operational conditions under which such a measure can generate benefits.

The pilot is implemented in ZIP codes 20121, 20122, 20123 and 20129, using So.De's existing city hub at Via Calatafimi 10 and its adapted OVO management system. Route-level indicators—including travelled kilometres, parcels, stops, shipments, weight, route duration and the share of IKEA co-loaded deliveries—are monitored to compare the performance of the two fleet configurations and provide evidence for the subsequent replicability assessment.

Table 15: Synthetic benchmark between two and three-wheels cargo bikes

Category	Long John (Bullitt)	Tricycle (Tricylift)
Type		
Public perception	Agile and widely used for goods transport	Bulkier and less agile, but closer to a van, making it easier for the public to picture logistics services
Weight & volume	100 kg payload, limited space, often volume constraints with bulky items	200 kg payload, 2 m³ box, optimized for bulky deliveries. Volume is usually saturated before weight
Protection	Open loading area, limited weather protection for goods and rider	Enclosed box and rider pedalling comfort (recumbent drive)
Stability & safety	2 wheels, less stable when heavily loaded	3 wheels, more balance and safety with heavy or voluminous loads
Brand visibility	Limited space for logos/visibility	Large box surface ideal for branding and visibility

Alongside the operational test of the cargo-bike fleet, the Milan Living Lab tests a consumer communication measure designed to increase awareness, trust and acceptance of sustainable cargo-bike home delivery. The measure consists of revising and expanding IKEA's customer-facing communication so that the sustainability benefits of cargo-bike delivery are communicated more clearly and credibly. In particular, the checkout message on IKEA's website was redesigned to move beyond a generic environmental claim and explicitly communicate both the reduced environmental footprint of cargo-bike deliveries and the dignified and protected working conditions provided to couriers.

The communication measure is implemented across several customer touchpoints, including the IKEA online checkout, postcards delivered with parcels, QR-code access to a post-delivery survey, LinkedIn posts, So.De newsletters, landing pages and planned visibility measures associated with the branded tricycle box. The pilot assesses whether providing more specific information on both the environmental and social sustainability dimensions of the delivery service can influence consumer awareness, trust, willingness to choose the cargo-bike delivery option and willingness to recommend it.

From a replicability perspective, the pilot therefore provides a test case for assessing the transferability of sustainability-oriented customer communication as a complementary measure to the deployment of

cargo-bike deliveries. Particular attention is given to the extent to which such communication can be integrated into an existing e-commerce customer journey, taking into account the technical, organisational and corporate constraints of IKEA's online purchase process.

6.2 Replicability by private actors

6.2.1 Parrott Delivery

6.2.1.1 Background information about the company

Parrott Delivery is a logistics company based in Rome, Italy, specialised in sustainable urban deliveries using cargo bikes, logistics consulting, and express delivery services. Its main activities include the delivery of parcels, business supplies, and express shipments, with a particular focus on last-mile urban logistics. The company currently operates a fleet of six cargo bikes in Rome and employs approximately seven people, while also having access to around 2,000 m² of storage space to support its logistics operations. Parrott Delivery collaborates with several actors in the logistics and urban mobility sector, including Click&Log Roma City Logistics, Ferrovie dello Stato Italiane, and Gruppo Logistico Laziale Distribuzione. The company also provides same-day delivery services, working with e-commerce platforms and partners such as Wora and iCarry.

6.2.1.2 Replication Assessment

In the replication assessment done by the representative of Parrott the ZTL Tridente is clearly seen as a favourable regulatory framework and would match the operating conditions of So.De in Milan's *Quadrilatero della Moda* neighbourhood. However, the uncertainties surrounding the short- and long-term implementation of the ZTL make operational planning difficult.

Internally, the company has all the capacities, capabilities and expertise required to expand its operations. However, the main challenging factor remains the maturity of the market and the importance of having retailers willing to conduct their last-mile operations by cargo bike. Should retailers reach out to Parrott to carry out deliveries within the ZTL by cargo bike, the company would have the operational capacity to provide the service.

Regarding trailer testing, the company considers the cost of such equipment to be the main financial hurdle. It would therefore be important for them to identify either a temporary rental scheme or a potential collaboration that would allow them to integrate a trailer into their fleet. Potentially gaining further market share in Rome's city centre could make such an investment more financially feasible.

Figure 20: Parrott Replicability self-assessment



6.2.1.3 Action Plan

Parrott sees good margin to replicate the Milan pilot, initial steps are already being envisaged and are detailed below.

Table 15: Parrott Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1.	Month 1	Parrott should engage with the City of Rome through the existing *tavolo merce* to discuss the possibility of testing cargo-bike deliveries within the ZTL Tridente. The objective is to clarify the conditions for the pilot, access arrangements and what evidence the City would need to assess the model.	City of Rome; *tavolo merce*; other freight and logistics stakeholders, Parrott /
2.	Month 1–2	Map supermarkets, retailers and other businesses with delivery needs in the Tridente area. Particular attention should be given to the supermarket that has already contacted Parrott. The aim is to identify sufficient delivery density to make cargo-bike operations commercially viable.	Supermarkets; retailers; intermediary/logistics companies, Parrott commercial team
3.	Month 2–3	Assess whether deliveries should be operated directly from retailers or through a consolidation point outside/at the edge of the ZTL. Define routes, delivery windows, consolidation requirements and the appropriate vehicle type. A two-wheel cargo bike could be used for smaller deliveries,	Retailers; logistics intermediaries; potential consolidation/hub operators, Parrott operations team

		while a quadricycle could be considered for higher volumes.	
4.	Month 2–3	Determine the appropriate equipment according to the goods and delivery volumes. For supermarket deliveries, the Polybox may be sufficient; larger volumes may require a quadricycle. Establish operational limits for volume, weight and number of deliveries per trip.	Supermarkets; vehicle/equipment suppliers, Parrott operations/fleet team
5.	Before the end of the current ZTL test period	Run a limited operational test with one or more retailers to compare cargo-bike and van deliveries. The supermarket's existing internal test, which reportedly found cargo bikes more effective than vans for the relevant deliveries, can provide a starting benchmark.	Supermarket/retail partner; drivers/couriers; City of Rome, Parrott
6.	During the pilot	Collect data on delivery times, number of deliveries per route, vehicle utilisation, operating costs, distance travelled and access/parking advantages. Particular attention should be given to whether the slower movement of cargo bikes across the wider city is offset by easier access and unloading within the ZTL.	Retail partners; couriers; City of Rome Parrott operations team
7.	Month 3–4 / after pilot	Assess whether sufficient delivery density exists to make the service economically viable. If individual deliveries are too costly, examine consolidation across several retailers or the use of a shared logistics intermediary.	Retailers; supermarkets; logistics intermediaries Parrott commercial + operations teams
8.	Towards the end of the ZTL test period	Based on the pilot results, engage with the City on the conditions required for continued cargo-bike operations in the ZTL. This could include loading/unloading arrangements or other operational provisions.	City of Rome; *tavolo merce*; freight operators; other relevant authorities Parrott
9.	Month 4–6	If the pilot demonstrates sufficient demand and operational feasibility, formalise cooperation with retailers and intermediaries. Expand the number of participating retailers to increase route and delivery density.	Supermarkets; retailers; logistics intermediaries Parrott business commercial team
10.	After the test phase	Use the evidence from the pilot to establish a longer-term cargo-bike delivery model for the Tridente, potentially based on consolidated deliveries from several retailers and/or a hub-and-spoke model.	City of Rome; retailers; logistics operators; transport/freight stakeholders, Parrott

6.2.2 La Sajetta

6.2.2.1 Background information about the company

La Sajetta is a cycle logistics company based in Parma, Italy, operating since 2013. The company provides sustainable last-mile delivery services throughout the area within Parma's ring roads, with a particular focus on the ZTL (Limited Traffic Zone). Its operations are supported by a micro-hub located at the edge of the restricted zone, where customers can drop off parcels for same-day delivery using exclusively electric cargo bikes.

La Sajetta serves a diverse range of customers, including neighbourhood shops, supermarkets, offices, medium and large companies, medical laboratories, local producers, and dental clinics. Its deliveries mainly consist of documents, parcels, registered mail, printer toner, dental products, groceries, stationery, pastries, and flowers. The company typically operates with a small team of two to three employees, consisting of one full-time and two part-time workers, while its workforce can increase to eight or nine employees during the peak November–December period.

Its fleet includes electric cargo bikes, conventional bicycles, and cargo trailers. La Sajetta has developed its customer base through direct engagement with local businesses, word-of-mouth, and social media, reflecting its strong connection to the local community. In addition to its logistics activities, the company has developed several community-oriented initiatives, particularly in the area of social inclusion. Cargo bikes provide an accessible entry point into the labour market for disadvantaged people, as they do not require a driving licence and can offer greater stability through three-wheeled designs.

6.2.2.2 Replication Assessment

When assessing the replicability of the Milan pilot, La Sajetta concentrated on the social dimension of the operations, meaning to propose a model were the logistics company serves the integration of refuges on the local labour market, while also ensuring the right training and contractual security.

Regulatory Framework: La Sajetta operates within a generally supportive regulatory environment. The existence of Limited Traffic Zones (ZTLs) creates favourable conditions for sustainable urban logistics solutions, as access restrictions can encourage the use of low-emission delivery models. However, the impact of these regulations is currently limited by the widespread availability of permits allowing conventional vans to enter restricted areas. Furthermore, electric vans are still permitted to access pedestrian streets and are only expected to become subject to access fees in the future. While the regulatory framework offers opportunities for replication, stronger incentives for clean and consolidated last-mile delivery would further strengthen the business case.

Cross-Departmental Collaboration: The operational model requires relatively limited internal coordination, as the initiative is managed by a small team and involves straightforward logistics processes.

Collaboration with Customers and Clients: There appears to be strong market demand for the service. Existing and potential clients, including local businesses such as a patisserie and a flower shop, have already expressed interest in collaborating with La Sajetta. The organisation has also established partnerships with retailers, including Carrefour, for home delivery services. At present, growth is constrained more by operational capacity than by customer demand. The use of vouchers and the current collaboration with logistics operators through two ZIP codes demonstrate that the model could be scaled further if additional resources become available.

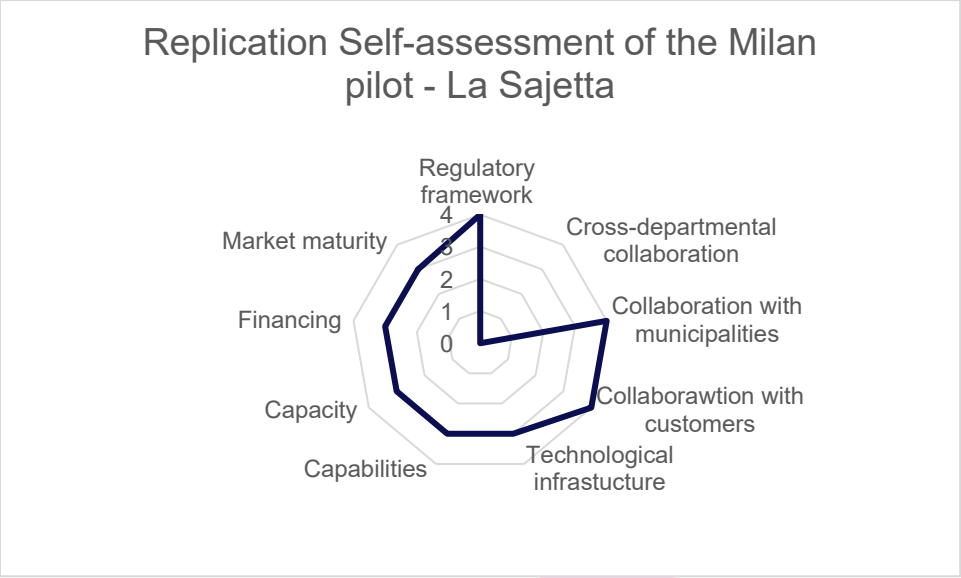
Collaboration with the Municipality: La Sajetta successfully participated in a municipal call for proposals and obtained access to a hub location, providing a physical base for operations. Although rent must be paid for the use of the space, the municipality's willingness to allocate urban logistics space demonstrates a form of institutional support.

Technological Infrastructure: The initiative relies on a dedicated delivery planning and routing software solution (So.De Kit) to manage operations. While such tools improve efficiency and scalability, they do not represent a significant technological barrier since similar logistics management solutions are widely available on the market. Replication would therefore require access to basic digital planning capabilities rather than advanced or highly specialised systems.

Capabilities and Human Resources: The current model functions effectively at its present scale; however, future expansion would require additional staff. This suggests that operational know-how is already in place, but growth could be limited by human resource availability and recruitment capacity. Replication is feasible, although organisations seeking to scale the model should anticipate the need for dedicated personnel and operational management capabilities.

Financing: Funding opportunities exist through public calls and foundations, particularly for social enterprises. However, these funding streams generally support established organisations rather than business creation. Access to start-up capital remains a challenge, as applicants are typically required to demonstrate an existing business plan and operational viability before becoming eligible for financial support. As a result, while funding can facilitate growth and consolidation, securing resources during the initial development phase may represent a barrier to replication.

Figure 21: La Sajetta Replication self-assessment



6.2.2.3 Action Plan

Concrete steps towards implementation have already taken place since the workshop happened and are detailed in the below table.

Table 16: La Sajetta Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	Months 1-4	Discuss with CIAC association in Parma about combining activties and becoming as “empresa sociale” (social enterprise in English).	CIAC, La Sajetta
2	Month 4-5	Develop a joint business plan with training and repair chop activities where refugees close to the association would be trained and employed	CIAC, La Sajetta
3	Month 6-tbd	Use space won by La Sajetta in the tender process last year to open hub	CIAC, La Sajetta, City of Parma
4	Month 7-tbd	Increase customer base (flower shop, pastry chops had expressed interest to use cargo delivery.	CIAC, La Sajetta, Retailers

6.2.3 UPS

6.2.3.1 Background information about the company

UPS (United Parcel Service) is a global logistics and parcel delivery company providing a wide range of services, including transportation, distribution, warehousing, and supply chain solutions. The company serves both B2B and B2C delivery services markets, delivering e-commerce and retail parcels, industrial goods, and specialized healthcare products such as pharmaceuticals, medical devices, and vaccines.

UPS operates across more than 200 countries and territories and delivers millions of packages every day through an extensive global network combining road, air, and last-mile transportation. Road transport represents the majority of its delivery operations, particularly for regional and last-mile distribution, while air freight is primarily used for long-distance and international shipments. Where infrastructure allows, UPS is also testing to integrate rail and intermodal transport into its network. Sustainability has become an important part of the company's logistics strategy, with solutions including the use of alternative fuels such as HVO and Sustainable Aviation Fuel (SAF), electrification through electric delivery vans and e-bikes, and route optimization to improve network efficiency and reduce emissions.

UPS also invests in energy-efficient buildings and facilities and offers carbon-neutral shipping options to customers. To support these initiatives, the company collaborates with a wide range of stakeholders, including fuel suppliers, vehicle manufacturers, logistics partners, technology providers, customers, NGOs, and certification bodies, enabling the development and implementation of lower-emission and more sustainable logistics solutions.

6.2.3.2 Replication Assessment

Several barriers could affect the wider replication of cycle logistics from the perspective of UPS. The current national regulatory framework does not yet provide sufficient support for the development of cargo-bike logistics. In particular, cargo bikes are required to use cycling infrastructure, while the dimensions permitted under the road code can limit the length and width of cargo bikes. This can constrain the development and deployment of larger or more innovative cargo-bike configurations.

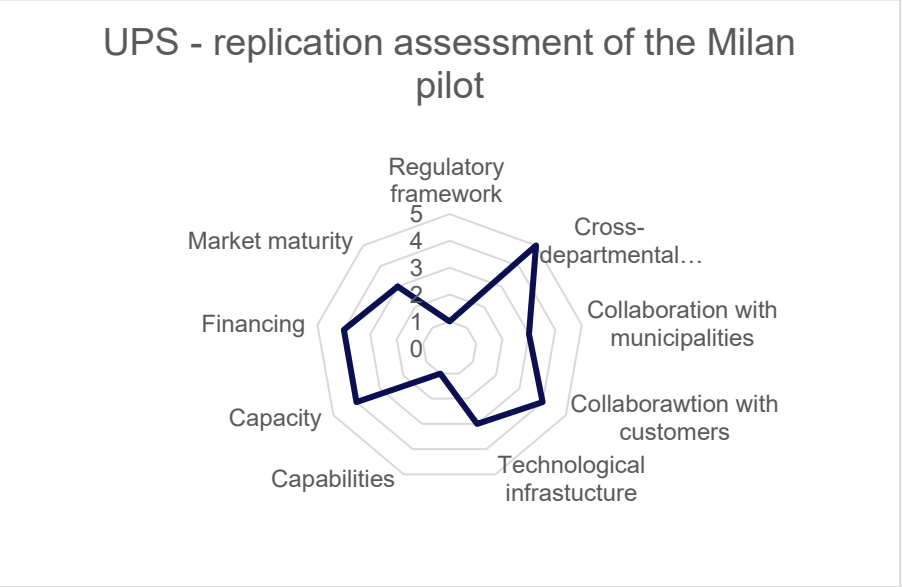
Market acceptance also remains an important challenge. Some clients remain sceptical about the safety and reliability of cargo-bike deliveries, particularly for high-value goods, which represent an important part of the shipments handled by operators such as UPS. Building confidence in the security of these operations may therefore require specific procedures and potentially additional training for staff involved in handling and delivering high-value goods.

The capacity limitations of cargo bikes can also affect the attractiveness of the model for retailers that work mainly on B2B like UPS. Compared with vans, cargo bikes can carry lower volumes per delivery, potentially requiring several deliveries to the same retailer during the day. This can conflict with the preferences and operational routines of shops, which may favour a single daily delivery aligned with specific inventory and receiving schedules.

Infrastructure represents a further barrier, particularly where private logistics hubs are concerned. The cost of securing and operating suitable space on the private market close to the most demand dense urban areas (city centers) can be significant, especially in dense and high-value urban environments such as Milan. At the same time, existing infrastructure planning has not yet extensively explored smaller-scale solutions such as mini-hubs or container-based hubs, which could potentially provide a more flexible and lower-space alternative.

Finally, market maturity and delivery density remain critical conditions for scaling cycle logistics. Larger volumes of goods being transported by cargo bike could significantly improve the viability of the model. The experience of UPS indicates that cargo bikes are already used where operational conditions are favourable, particularly in areas with relatively flat topography, sufficient delivery density and a high concentration of small-parcel deliveries. This suggests that the potential for replication is closely linked to the characteristics of the local market and urban environment.

Figure 22: UPS replication self-assessment of the Milan pilot



6.2.3.3 Action Plan

No full deployment plan was developed by UPS, yet some actions were identified that could be along those lines:

- Make in-house market search on real estate development for micro hubs or containerised hubs.
- Asses which sectors would be keen on receiving deliveries by cargo bike.
- Eventually asses which training investments would be required for cargo bike drivers
- Follow regulatory development regarding national laws on cargo bike standards.

6.3 Replicability by public authorities

6.3.1 Rome - Roma Servizi per la Mobilità (RSM)

6.3.1.1 Background information about the city

Rome has a Sustainable Urban Logistics Plan (SULP) which combines regulatory measures and infrastructure investments to improve urban freight sustainability. Key measures include the deployment of logistics micro-hubs, promotion of cargo bike deliveries, expansion of parcel lockers and pick-up/drop-off points, optimisation of loading bays, and stricter freight management within the city's ZTL. The city is also supporting the transition towards zero-emission freight vehicles while using extensive stakeholder engagement to build support for implementation.

6.3.1.2 Replication Assessment

The replication potential of the proposed urban logistics measures tested in Milan, depends first on the existing political, regulatory, institutional, and infrastructural conditions of the city of Rome.
From a political perspective, the municipality provides technical support for sustainable urban logistics, but its ability to directly support private logistics operators through the provision of public space is challenging. This is particularly relevant in the city centre, where very little public space is available for logistics activities. While potential locations for logistics mini-hubs may exist outside the Tridente area, their implementation would require political and administrative support from the relevant municipal departments. The approved Sustainable Urban Mobility Plan (SUMP) and Sustainable Urban Logistics

Plan (SULP) provide an important strategic foundation for sustainable freight initiatives; however, the main challenge lies in translating these plans into concrete actions and ensuring their effective implementation. Rome's current policy activities also demonstrate an established interest in innovative urban logistics: the municipality has participated in initiatives such as MOVE21 and has developed a Living Lab approach for urban logistics.

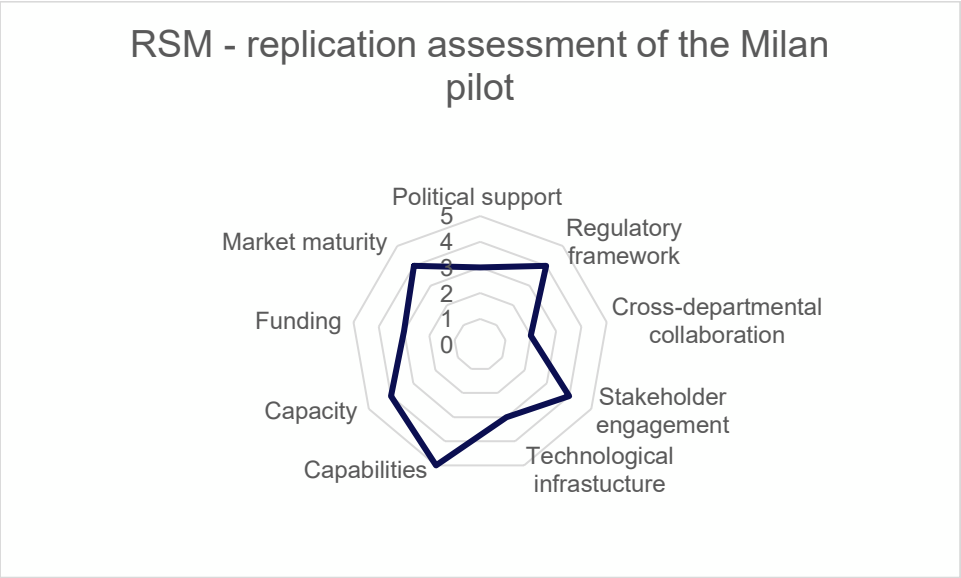
From a regulatory perspective, the municipality has an important role in defining access conditions for urban freight through the regulation of Limited Traffic Zones (LTZs). Vans currently pay an annual fee to access the LTZ with different rates depending on the Euro category (ranging from yearly fee of 1152€ to 2032€), while, according to the assessment, since 1 July 2026 electric vehicles are also required to pay to enter the Tridente area. The measure is intended to manage the significant increase in electric vehicles already authorized to enter the ZTL (restricted traffic zone), reduce traffic congestion levels within these zones, and improve the availability of parking for authorized vehicles. This means that vehicle electrification alone does not necessarily provide preferential access to the area and therefore may not be sufficient to incentivise a shift towards zero-emission delivery vehicles. At the same time, the existing regulatory and technological framework provides a basis for more targeted freight-management measures. Electronic gates and time-window management are already in place, while the municipality is also developing systems to monitor vehicles and parking. Rome's strategic planning documents further identify the use of electronic access control and more flexible permit management as part of the evolution of the city's ZTL system.

Inter-institutional coordination represents another important condition for replication. Cooperation between the mobility, urban planning, and environmental departments would need to become stronger, while links with the social affairs department are currently more limited. This is particularly relevant if sustainable logistics initiatives are expanded to include a social dimension, such as training and employment opportunities through cycle logistics. Stronger institutional coordination could therefore facilitate the transition from strategic planning to implementation and help clarify responsibilities for measures involving public space, mobility regulation, environmental objectives, and social inclusion.

The involvement of private and local stakeholders is also essential. Bringing together logistics service providers, retailers, merchants, and other actors with different operational and commercial interests remains challenging. A Living Lab and discussion platform already provide a basis for dialogue, yet retailer associations would need to be more actively engaged, including through direct contact with individual businesses and the aggregation of merchants within the Tridente. This is particularly important because identifying a suitable location for a logistics hub is only the first step; the success of such a facility ultimately depends on finding logistics service providers and merchants willing to use and finance the service.

There are also several infrastructural and technological considerations affecting replication. The existing electronic access-control system and parking-monitoring infrastructure provide a positive basis for managing deliveries, while the planned installation of exit gates in the Tridente and in the LTZ of the historical centre could provide additional information on vehicle movements and delivery patterns. However, the lack of dedicated cycling infrastructure remains a limitation for the wider deployment of cargo-bike logistics. These conditions suggest that replication would require not only a suitable regulatory framework but also sufficient physical infrastructure and reliable data to assess how new delivery models perform in practice.

Figure 23: RSM - replication self-assessment of the Milan pilot



6.3.1.3 Action Plan

Against this replicability assessment background, two measures emerging from the Milan pilot appear particularly relevant for Rome: the creation of mini-hubs and the promotion of cycle logistics**.**

Discussions have already taken place with cargo-bike operators concerning the development of container-based hubs around the city centre**,** and potential locations have been identified in parking spaces that are currently underused. The mobility department would, however, need to approve the use of these spaces. The mini-hub concept could allow goods to be consolidated outside or at the edge of restricted areas before being transferred to cargo bikes for the final delivery stage. This would directly support the objective of reducing the number of conventional vans entering the city centre.

The Tridente represents a particularly relevant area in which to test these measures. Its characteristics can be compared with Milan's Quadrilatero della Moda, as both areas have a high concentration of luxury retail and require frequent deliveries of relatively high-value goods. In both contexts, an important objective is to reduce the number of delivery vans entering the area without compromising the service provided to retailers. In Rome, the existing electronic access-control system provides an opportunity to monitor the effect of potential changes in delivery arrangements. Measuring average delivery times, vehicle numbers, and the performance of cargo-bike deliveries could therefore help determine whether cycle logistics can provide an effective alternative for deliveries within the Tridente.

Replication could be extended beyond physical logistics infrastructure through the promotion of lockers and PUDO (Pick-Up and Drop-Off) points. A communication campaign combined with a survey could assess the willingness of retailers and customers to use these alternatives, and there has already been interest from the administration in exploring this approach. The potential introduction of a social delivery model, involving training and integration opportunities, could provide an additional dimension to the replication process, although this would require the involvement of the appropriate municipal departments and organisations working in social integration.

Overall, Rome presents a promising but conditional environment for replication**:** the strategic and regulatory foundations are largely in place, but successful implementation will depend on access to suitable space, stronger institutional coordination, stakeholder engagement, and the adaptation of the Milan measures to Rome's specific operational and regulatory context.

Table 17: RSM Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1.	Month 1-2	Build on the discussions already held with cargo-bike operators to define the operational requirements for mini-hubs and cycle logistics. Identify potential operators, delivery flows and types of goods that could be suitable for consolidation and cargo-bike delivery.	Cargo-bike operators; logistics companies; retailers; freight operators, Mobility Department (RSM)
2.	Month 1-3	Map underused parking spaces and other potentially suitable locations around the city centre and assess their suitability for container-based mini-hubs. Consider accessibility, proximity to delivery demand, space availability and potential conflicts with other uses of public space.	Local municipalities/districts; cargo-bike operators; local businesses Mobility Department (RSM)
3.	Month 2-4	Seek the necessary administrative approval for using selected parking spaces or other public areas for mini-hubs. Develop an operating agreement defining responsibilities for installation, maintenance, access and use of the hub.	Cargo-bike operators; property/space owners; Mobility Department (RSM)
4.	Month 2-3	Define the Tridente as the initial testing area, given its concentration of luxury retail and its similarities with Milan's Quadrilatero della Moda. Establish the baseline situation for deliveries, including the number of vans entering the area and existing delivery patterns.	Retailers; logistics operators; cargo-bike operators; Tridente stakeholders, Mobility Department (RSM),
5.	Month 3-4	Design the mini-hub and cycle-logistics model. This could involve consolidating goods outside or at the edge of the restricted area before transferring them to cargo bikes for final delivery. Define delivery windows, consolidation processes, vehicle requirements and responsibilities.	Cargo-bike operators; logistics companies; retailers, Mobility Department (RSM),
6.	Month 3-4	Use the existing electronic access-control system and other available data to establish indicators for the pilot. These should include average delivery times, number of conventional vans entering the Tridente, number and performance of cargo-bike deliveries, and potentially vehicle kilometres and delivery reliability.	Technology providers; logistics operators; cargo-bike operators; retailers, Mobility Department (RSM)

7.	Month 4-6	Identification and authorisation to use the areas and installation of the infrastructure (mini-hubs/lockers)	Technology providers; logistics operators; cargo-bike operators; retailers, Mobility Department (RSM)
8.	Month 6-16	Run the test phase	Technology providers; logistics operators; cargo-bike operators; retailers, Mobility Department (RSM)
9.	Month 6-17	Evaluate	Technology providers; logistics operators; cargo-bike operators; retailers, Mobility Department (RSM)

6.3.2 Bologna

6.3.2.1 Background information about the city

The Metropolitan City of Bologan and the city of Bologna has developed a comprehensive approach to urban freight through the adoption of both a Sustainable Urban Mobility Plan (SUMP) and a Sustainable Urban Logistics Plan (SULP). These strategies address the growing impacts of freight distribution, parcel deliveries and e-commerce while supporting the city's wider climate and mobility objectives.

A key element of this approach is Bologna's Low Traffic Zone (LTZ), introduced in 2005 and progressively strengthened over time. Covering around 80% of the historic city centre (3.2 km²), the LTZ is controlled through 18 access points and automated enforcement systems. Since 2020, environmental criteria have been incorporated into access regulations, encouraging logistics operators to gradually shift towards cleaner vehicles.

Combined with the implementation of the "City 30" initiative, the LTZ has become an important tool for reducing emissions from urban freight transport. The city plans to continue tightening access requirements, with the long-term ambition of restricting LTZ access to electric vehicles by 2030, significantly reducing CO_2 emissions from logistics activities.

At the metropolitan level, the SULP extends beyond the city centre to include industrial areas, logistics nodes and critical infrastructure. Within the framework of the URBANE project, Bologna and its partners developed a business model for a network of sustainable micro-logistics hubs, supported by innovative last-mile delivery solutions such as cargo bikes and light electric delivery vehicles. The initiative aims to improve delivery efficiency while reducing congestion and environmental impacts.

An important outcome of Bologna's approach has been the strengthening of cooperation between public authorities and private stakeholders. This resulted in several collaborative initiatives, including the signing of the Ethical Metropolitan Logistics Agreement in 2022, demonstrating how stakeholder engagement can support the transition towards a more sustainable and efficient urban logistics system.

The City of Bologna is also part of the EU Mission for Climate-Neutral and Smart Cities and signed an ambitious climate neutrality pathway through its Climate City Contract. In support to these objectives, the NetZeroCities programme is providing tailored technical assistance to Bologna through the City Expert Support Facility to develop a targeted scenario assessment and pilot street implementation framework for sustainable urban logistics and last-mile deliveries within the ZTL. This provides a potetial context for replication.

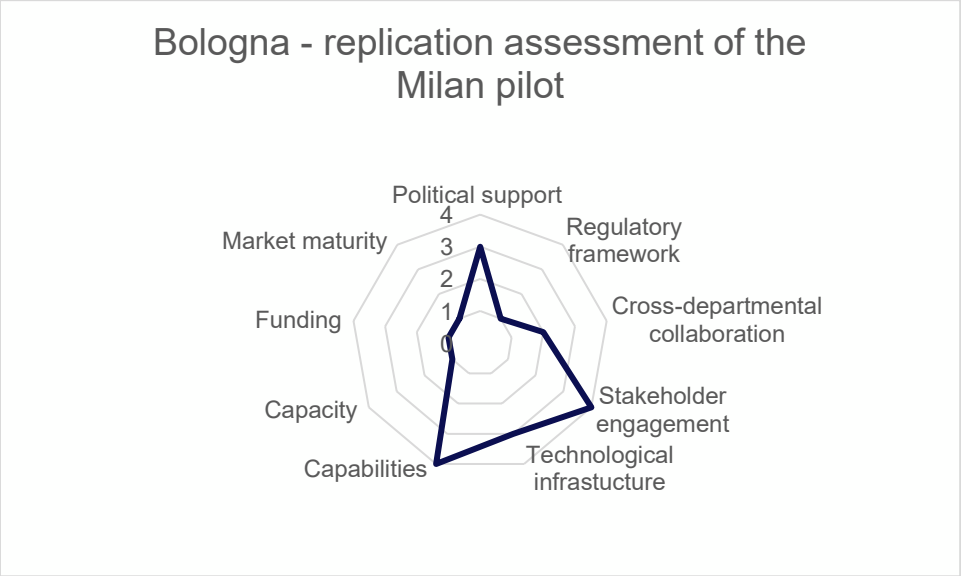
The assignment will initially focus on four priority tram corridor streets and will provide a high-level replication methodology to guide the subsequent extension of the approach to the wider ZTL, with the aim to reorganise last-mile urban freight distribution in a way that reduces congestion and emissions, supports the transition towards low-emission and net-zero logistics models, safeguard tram operations and pedestrian areas, ensures a more efficient and coherent use of limited public space within the ZTL, and ultimately support Bologna's wider climate neutrality commitments. The procurement phase started in October 2026.

6.3.2.2 Replication Assessment

The replication assessment shows that the replication of the Milan measure would be feasible yet challenging on many aspects (four criteria are ranking below or equal to 2).

While political support and stakeholder engagement are ranked high due to effective political willingness to engage in the topic and ongoing collaboration with the ecosystem thanks to several EU- funded projects, the municipality would face major barriers on funding availability, lacking regulatory frameworks and staff availability. The municipality has existing expertise on the subject of urban logistics however, there is little staff available to work on urban logistics policies. The low parking fees in the city centre are considered a hurdle in the replication of such micro-hub, mainly due to lack of incentivisation and constraints for such usage.

Figure 24: Bologna - replication self-assessment of the Milan pilot



6.3.2.3 Action Plan

Bologna presents several opportunities to replicate and adapt the micro-hub model developed in Milan, particularly in response to the increasing pressure on the city centre's road space.

The arrival of the new tram network is expected to further reduce space available for conventional vans and could create additional challenges for deliveries during daytime hours. At the same time, cycling is increasing in Bologna, and the use of cargo bikes is gradually developing, although their uptake remains limited and some local businesses continue to manage deliveries with their own vehicles. These

developments create a potential case for combining proximity logistics spaces, cargo-bike deliveries, and alternative delivery times. Rather than directly transferring the Milan model, Bologna could first distinguish between different types of demand, particularly deliveries to shops and deliveries to individual customers, and assess which delivery models are most appropriate for each.

A first step would be to better understand the current situation in the areas affected by the tram. A survey of retailers could identify what types of goods are delivered, at what times, by which vehicles, and how frequently deliveries take place. This information could be combined with an analysis of ZTL access points and vehicle movements to identify when and where delivery vehicles enter the historic centre. Such evidence would help determine whether cargo-bike deliveries, night-time deliveries, unattended deliveries, or other solutions could realistically replace part of the current van traffic. In particular, the municipality could investigate whether cargo-bike deliveries could prevent double parking, which is currently a significant issue, or whether night-time deliveries using secure solutions such as large lockers or unattended delivery areas could provide an alternative. Small autonomous delivery vehicles could also be considered in combination with the tram infrastructure, although their feasibility and acceptance would need to be assessed.

The availability of suitable micro-hub locations would be another critical element. Bologna could conduct a systematic mapping of underused spaces within approximately 200 meters of the historic city centre, including office spaces and ground-floor commercial or other privately owned premises. Once potential locations have been identified, the municipality could launch a public call for proposals to identify operators or organisations interested in developing and managing a micro-hub. This approach could allow Bologna to overcome the limitations associated with directly providing public space while still facilitating the creation of a distributed logistics network close to the city centre.

An important opportunity for replication lies in Bologna's existing funding and innovation mechanisms. The city's participatory budgeting and *Cittadinanza Attiva* framework could potentially be used to support a locally adapted version of the Milan So.De. model, particularly if the project incorporates a strong social dimension. The idea of combining logistics with social inclusion, training, and employment opportunities appears particularly relevant in Bologna, where previous initiatives involving the municipality and Fondazione Innovazione Urbana have explored the concept of an ethical delivery company. A local organisation or logistics operator could potentially apply for funding through an appropriate municipal call, with the micro-hub and cycle-logistics components presented as part of a wider neighbourhood regeneration and social innovation project. However, this would require identifying a suitable local actor able to develop and submit the proposal, as well as establishing stronger links between the mobility department and the departments responsible for active citizenship and social initiatives.

The replication process could also build on Bologna's wider innovation ecosystem and existing programmes, which support innovation and investment. These platforms could provide an opportunity to investigate whether a micro-hub or sustainable urban logistics pilot could qualify under existing innovation or public-interest funding schemes. At the same time, the experience of retailers and logistics operators suggests that cost competitiveness will be an important consideration. For example, discussions with IKEA indicated that cycle logistics can currently be significantly more expensive than conventional delivery methods, meaning that the business case for micro-hubs and cargo-bike deliveries cannot rely on environmental benefits alone. The model may therefore need to combine operational efficiencies with public support, social value, or other incentives.

Table 18: Bologna Replication Action Plan

Step	Timeline	Description of step and responsible department / organisation	External stakeholders involved
1	*Month 1-3*	*Identify the flows of e-commerce and the density of deliveries (like AMAT did with the Politecnico di Milano)*	*University* *Chamber of commerce* *City of Bologna* *Retailers*
2	*Month 2-3*	*Call in stakeholder mapping*	*LSP* *City of Bologna* *Retailers*
3	*Month 3*	*City launches call for collaboration*	*City of Bologna*
4	*Month 4-5*	*Cargo bike company to search and define retailers to collaborate with*	*LSP, retailer*
5	*Month 6-11*	*Find hub location with selected partner*	*LSP* *City of Bologna* *Retailers*
6	*Month 6-12*	*Launch activities*	*LSP* *City of Bologna* *Retailers*

6.3.3 Parma

6.3.3.1 Background information about the city

Parma is an Italian city covering approximately 256 km² and home to around 200,000 inhabitants, with its population having increased by approximately 30,000 over the past two decades. The city also hosts around 30,000 university students and attracts more than one million tourists annually, supported by its growing reputation as a tourist destination and “city of gastronomy.” Parma has introduced several measures to manage urban mobility and improve the quality of its historic centre, including a Limited Traffic Zone (LTZ) covering approximately 39% of the historical centre, low-speed zones covering around 20% of the city, and pedestrian areas representing approximately 8% of the historic centre.

These measures are supported by the Sustainable Urban Mobility Plan (SUMP), a long-term strategic framework aimed at improving the movement of people and goods across the urban and surrounding areas. Within its SUMP, Parma places significant emphasis on urban logistics, including redefining access, transit, and parking regulations in the city centre and introducing a Zero Emission Zone (ZEZ) for goods delivery vehicles. The plan also proposes the creation of proximity logistics spaces, where goods can be consolidated and transferred to smaller, less polluting vehicles for last-mile delivery, potentially incorporating parcel lockers to facilitate flexible and asynchronous transfers. In addition,

Parma aims to promote cycle-logistics services using cargo bikes, support the electrification of commercial vehicles by expanding charging infrastructure, and introduce innovative parking and urban-space management systems using technologies such as sensors and intelligent systems. Overall, these measures demonstrate Parma’s efforts to combine sustainable mobility, cleaner freight transport, and innovative last-mile logistics solutions.

6.3.3.2 Replication Assessment

Replication overall ranks high in Parma since all replicability cireteria rank equal or above 4.

Political Support: The Municipality of Parma demonstrates strong political support for sustainable urban logistics by making a municipal facility available to serve as a hub for cycle logistics activities. This tangible commitment provides a concrete foundation for implementing and scaling cargo bike-based last-mile delivery solutions.

Regulatory Framework: Parma has an enabling regulatory environment that supports sustainable urban logistics. The city has implemented a Limited Traffic Zone (LTZ), a Zero Emission Zone (ZEZ) for goods delivery vehicles, and pedestrianized areas in the city centre. In addition, strategic planning tools such as the Sustainable Urban Mobility Plan (SUMP) and the BiciPlan provide a policy framework that encourages sustainable mobility and logistics solutions.

Cross-Departmental Collaboration: The Municipality of Parma has experience in working across departments and engaging external actors through participatory processes. Municipal projects are regularly developed with the involvement of citizens, technical experts, educational institutions, and trade associations, fostering collaboration and shared ownership of initiatives.

Stakeholder engagement mechanisms are already embedded in municipal planning processes. The development of the BiciPlan and the SUMP involved consultations with a range of stakeholders, including technical experts and relevant sector representatives. Further engagement with logistics operators could strengthen support for the replication of the selected practice.

Technological Infrastructure: The municipality possesses the infrastructure required to support the implementation of the selected practice. Existing urban logistics and mobility infrastructure provide a suitable basis for expanding cycle logistics operations and related services.

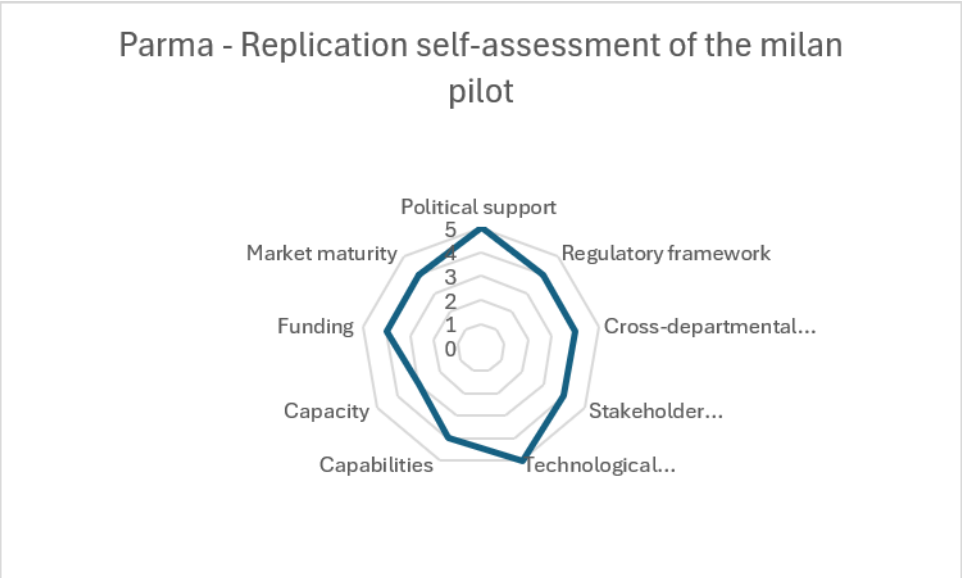
Capabilities: The Municipality of Parma has access to the expertise required to support the initiative. While the logistics analysis has been entrusted to an external specialist company, municipal technical staff are actively involved and available to collaborate throughout the project, ensuring knowledge transfer and local ownership.

Capacity: The municipality has dedicated technical staff capable of supporting the initiative. To strengthen its capacity, Parma has chosen to complement internal resources with external companies that specialise in logistics sector studies and analysis, allowing access to additional technical expertise.

Funding: The municipality is contributing in kind by providing a dedicated space that can be used as a logistics hub. The facility is expected to be leased to a company operating last-mile delivery services with cargo bikes, creating a potentially sustainable operational and financial model.

Market Maturity: The market for cycle logistics in Parma is already developing. A cargo bike delivery provider has been operating in the city for several years, demonstrating existing demand and market viability. More recently, a second operator began delivering fruit and vegetables directly from the wholesale produce market to school canteens, indicating growing interest and adoption of sustainable logistics solutions among local businesses and institutions.

Figure 25: Parma Replication self-assessment of the Milan pilot



6.3.3.3 Action Plan

The municipality did not provide a full deployment plan. However, actions recently launched already show some avenues for replicating the Pilan pilot. A call for applications has recently been launched offering subsidies for the purchase of e-bikes and cargo bikes; this initiative is open to both private citizens and businesses. This might stimulate greater uptake of such modes in the local logistics ecosystem. In addition, annual subsidies are available to companies that implement measures and initiatives for sustainable mobility; the purchase of cargo bikes and the use of cargo bike services for business operations are among the activities that earn the most points.

6.4 General considerations about the replicability of the Milan pilot measures

The assessment of the Milan pilot demonstrates that its core measures, particularly the promotion of cargo-bike deliveries with a mixed and diversified fleet, offer significant potential for replication in other urban contexts. The experiences of Rome, Bologna and Parma highlight that successful replication involves having regulatory frameworks in place that push the market towards adopting more cargo-bike based practices (i.a. UVARs).

Rome presents promising opportunities, particularly in the Tridente area (Limited Traffic Zone), where the concentration of luxury retailers and existing electronic access-control systems provide favourable conditions for testing micro-hubs and cycle logistics.

In terms of enabling conditions, the generalised absence of micro-hubs and similar spatial constraints is present in most cites. Such condition emphasise even more the need for collaboration with other actors since public space might not always be available for micro-hubs.

In all replicator cities the lack of internal staff to work on urban logistics is a barrier for replication. The link to the social dimension as promoted by So.De offers great avenues for the municipalities to connect this policy to other policy objectives such as inclusion and to diversify the funding opportunities for logistic activities.

The assessment of private-sector actors indicates that the replication of the Milan pilot is feasible, provided that the model can be adapted to local market conditions and demonstrate a clear business case for logistics operators and their customers.

The experiences of Parrott Delivery, La Sajetta and UPS highlight that the availability of operational expertise is not sufficient to ensure replication. The main determinants of success are the maturity of the local market, the density and predictability of delivery demand, access to suitable logistics infrastructure, and the ability to compete with conventional van-based deliveries in terms of cost, reliability and service quality.

Findings suggest that replication should be targeted towards delivery flows and customer segments where cargo bikes offer a genuine operational advantage, rather than assuming they can replace vans across all logistics activities.

Overall, the private-sector self-assessment suggests that successful replication of the Milan pilot requires a market sensitive and phased approach. Initial trials could establish delivery volumes, operational performance, vehicle utilisation and costs, while testing different hub configurations, equipment and customer partnerships. Public authorities can facilitate this process by enabling access to suitable spaces, providing regulatory certainty and supporting collaboration between logistics operators and retailers.

7 Conclusions

The self-assessment of the Milan, Antwerp, Utrecht and Oslo pilots shows that their measures can be replicated in other cities in the same national context, as well as other European cities, provided they are adapted to local regulatory, urban and market conditions. Successful replication requires cooperation between public authorities, logistics operators, retailers and citizens, alongside a clear assessment of operational and financial feasibility. Notably, replication activities have already moved beyond the planning stage and are currently being implemented in Bergen, demonstrating that the project has exceeded its original replication objectives and generated tangible uptake during the project lifetime. The Brussels Capital Region, Bologna, Rome, Parrott and La Sajetta are also already envisaging concrete actions towards replication.

Key messages for cities and public authorities

- ***Establish supportive and predictable regulations.*** Access restrictions, low- and zero-emission zones and appropriate parking rules encourage sustainable delivery models and provide certainty for investment.

- ***Facilitate access to suitable space.*** Micro-hubs, lockers and collection points require accessible, well-located sites. Where public space is limited, partnerships with private property owners can provide alternatives. Rewarding operators with better environmental performance through priority access to public space can be another option.

- ***Adapt measures to local conditions.*** Micro-hubs and cargo bikes are best suited to concentrated delivery demand and areas where they offer clear advantages. Collection points and lockers likewise require sufficient demand to be viable.

- ***Strengthen coordination and capacity.*** Dedicated public authorities' staff, stakeholder collaboration and adequate resources are essential to plan, implement and evaluate measures.

- ***Integrate communication and wider policy objectives.*** Joint campaigns involving cities, retailers, logistics operators and citizen organisations can encourage sustainable delivery choices. Logistics initiatives can also support social inclusion, training and employment. Public tender can also be used to reward operators with better social performance.

Key messages for e-tailers and logistics operators

- ***Offer the alternative first and make it affordable.*** Sustainable delivery cannot be selected if it is unavailable. E-tailers and operators can provide slower, consolidated and/or out-of-home options for all eligible orders and make them visible at checkout.

- ***Explain the trade-off.*** Customers may accept one or two additional delivery days when this is due to environmental and/or social responsibility and clearly communicated.

- ***Demonstrate commercial viability.*** Assess delivery volumes, operating costs, vehicle utilisation and potential efficiency gains before investing or scaling up.

- ***Choose solutions suited to the delivery flow.*** Cargo bikes, micro-hubs, lockers and collection points shall be prioritised whenever feasible, but are not universal solutions; their suitability depends on the goods, customer requirements and local context.

- ***Secure demand and partnerships.*** Collaboration with retailers and the consolidation of deliveries from different customers increase volumes and improve operational efficiency.

- ***Communicate sustainable options to customers.*** Retailers and logistics operators should make alternative delivery and collection options visible and convenient, ensuring that awareness campaigns are supported by accessible services.

- ***Optimise infrastructure and operations.*** Hub location, loading access, transhipment time, security, space costs and local regulations all influence operational feasibility.

- ***Test before scaling.*** Pilot trials should measure demand, costs, reliability and vehicle utilisation, providing evidence to refine the model and determine whether expansion is justified.

Annex A – Replication assessment template for companies

Replicator Company: [insert name]

Transferability Assessment is a criteria-based assessment designed to help companies understand if the chosen practices are transferable to their local context and identify potential barriers and risks for effective transfer to another market setting.

Transferable measure: [provide a descriptive title]

Assessment framework [fill out the table below for each selected practice]:

Enabling conditions	Scoring scale (from 1 to 5)	Score 1 to 5	Explain the reasoning for the given score in one or two sentences
1. Regulatory framework	1 – Regulatory frameworks inhibit the implementation of the selected practice 5 – The necessary regulatory frameworks are in place to ensure the implementation of the selected practice		
2. Cross-departmental collaboration	1 – The company lacks internal collaborative structures and processes to implement the measure smoothly. 5 – The company has all internal collaboration practices, processes and instruments in place for a smooth implementation.		
3. Collaboration with customers/clients	1 – The collaboration with clients /costumers would be a hurdle in the uptake 5 – The collaboration with clients /costumers is smooth and should allow an easy uptake		
4. Collaboration with municipality	1 – The company has no established collaboration with the municipality 5 – The company has a well established collaboration with the municipality		

5. Technological infrastructure	1 – The technological infrastructure necessary for the implementation of the selected practice is underdeveloped 5 – The company has the necessary infrastructure for the implementation of the selected practice in place.		
6. Capabilities	1 – The company has no relevant in-house expertise to implement the selected practice 5 – The company has in-house experts ready to support the implementation of the selected practice		
7. Capacity	1 – The company has a major lack of capacity to ensure the implementation of the selected practice 5 – The company can mobilise the necessary capacity to ensure the transfer and implementation of the selected practice		
8. Funding/Financing	1 – There are no financial means available to transfer and implement the selected practice 5 – Financial means for the transfer and implementation of the selected practice are secured		
9. Market maturity	1 – The market is not ready enough for the take up of such measure 5 – The market is mature enough for the efficient development and take up of this measure		

Annex B – Replication assessment template for cities

Replicator City: [insert name]

Transferability Assessment is a criteria-based assessment designed to help cities understand if the chosen practices are transferable to their local context and identify potential barriers and risks for effective transfer to the local setting.

Transferable measure: [provide a descriptive title]

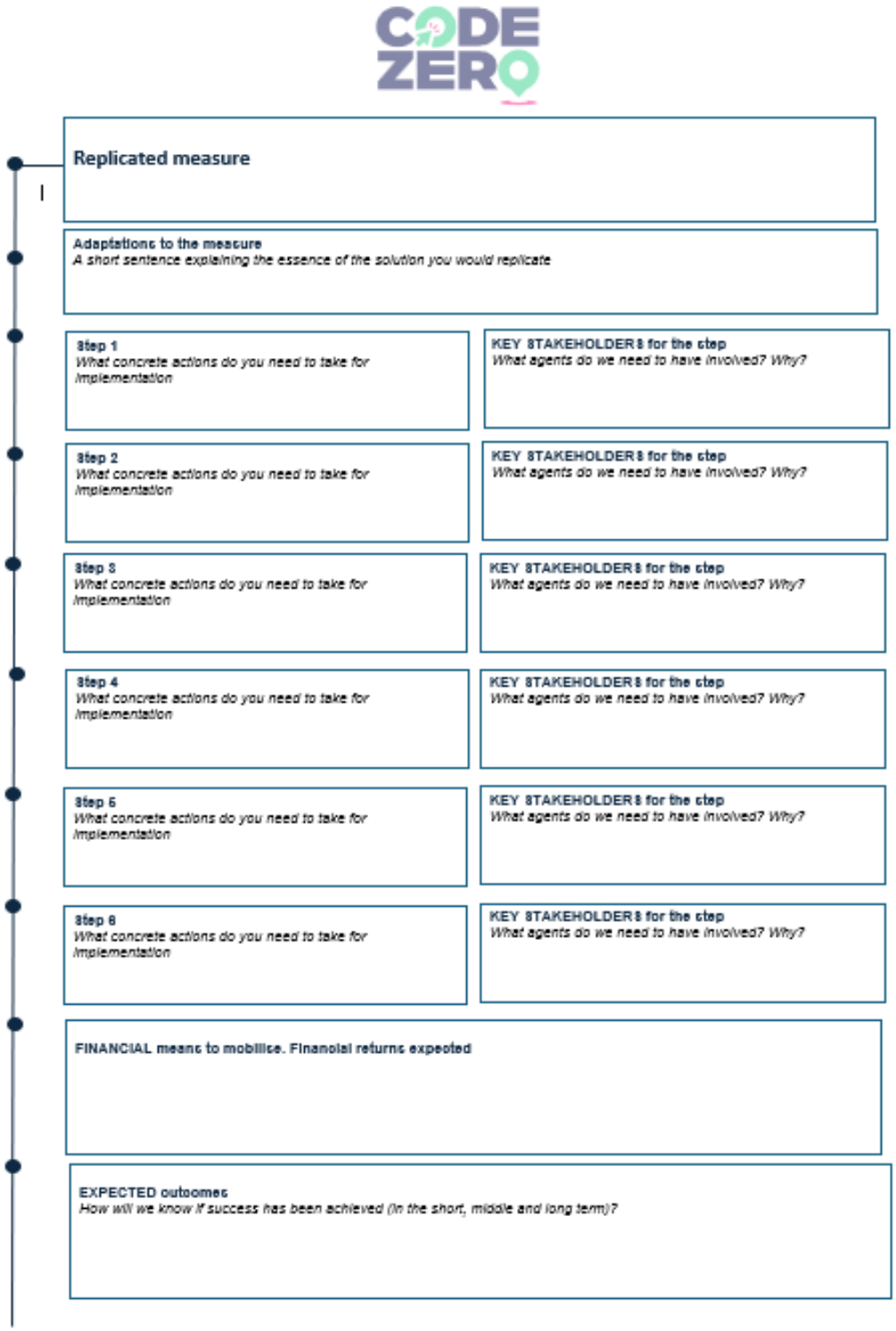
Assessment framework [fill out the table below for each selected practice]:

Enabling conditions	Scoring scale (from 1 to 5)	Score 1 to 5	Explain the reasoning for the given score in one or two sentences
1. Political Support	1 - The Municipality politically opposes the transfer of the selected practice 5 - The Municipality has strong political support for the implementation of the selected practice		
2. Regulatory framework	1 – Regulatory frameworks inhibit the implementation of the selected practice 5 – The necessary regulatory frameworks are in place to ensure the implementation of the selected practice		
3. Cross-departmental collaboration	1 – The Municipality lacks a culture of collective decision-making and internal collaboration 5 – The Municipality has in place collective decision-making and internal collaboration practices and instruments		

4. Stakeholder engagement	1 – The Municipality does not have in place citizen and stakeholder engagement processes or mechanisms 3 – The Municipality has in place a strong collaborative process with an open governance structure		
5. Technological infrastructure	1 – The technological infrastructure necessary for the implementation of the selected practice is underdeveloped 5 – The Municipality has in place the infrastructure necessary for the implementation of the selected practice		
6. Capabilities	1 – The Municipality has no relevant in-house expertise to implement the selected practice 5 – The Municipality has in-house experts ready to support the implementation of the selected practice		
7. Capacity	1 – The Municipality has a major lack of capacity to ensure the implementation of the selected practice 5 – The Municipality has mobilized the necessary capacity to ensure the transfer and implementation of the selected practice		
8. Funding	1 – There are no funds available to transfer and implement the selected practice 5 – Funds for the transfer and implementation of the selected practice are secured		

9. Market maturity (*optional)*	1 – There is no existing market or there are no companies capable of implementing the selected practice locally 5 – The market is mature and many different companies ready to help out with the implementation of the selected practice		

Annex C – Action Plan template used during the replication workshop



Replicated measure

Adaptations to the measure
A short sentence explaining the essence of the solution you would replicate

Step 1 *What concrete actions do you need to take for implementation*	**KEY STAKEHOLDERS for the step** *What agents do we need to have involved? Why?*
Step 2 *What concrete actions do you need to take for implementation*	**KEY STAKEHOLDERS for the step** *What agents do we need to have involved? Why?*
Step 3 *What concrete actions do you need to take for implementation*	**KEY STAKEHOLDERS for the step** *What agents do we need to have involved? Why?*
Step 4 *What concrete actions do you need to take for implementation*	**KEY STAKEHOLDERS for the step** *What agents do we need to have involved? Why?*
Step 5 *What concrete actions do you need to take for implementation*	**KEY STAKEHOLDERS for the step** *What agents do we need to have involved? Why?*
Step 6 *What concrete actions do you need to take for implementation*	**KEY STAKEHOLDERS for the step** *What agents do we need to have involved? Why?*

FINANCIAL means to mobilise. Financial returns expected

EXPECTED outcomes
How will we know if success has been achieved (in the short, middle and long term)?

Annex D – Exemplary agenda of a study visit and replication workshop in Olso on 5th March 2026

Time	Content
08.45-09:00	*Security check at Oslo City Hall*
09:00-09:15	*Registration and Welcome Coffee*
09:15-11:00	Welcome & Introduction by Bjarne Johannessen, Assistant Director General, City of Oslo Introduction to the pilot – presentations by: - Teodor Bäckström and Stig-Magne Pedersen, IKEA Norway - Patryk Bubilek, Agency for Urban Environment, City of Oslo - Agency for Urban Environment – City Patrol - Delphine Pernot, TOI - Howard Weir, TOI
11:00-11:15	*Short coffee break*
11:15-12:30	Replication Workshop part 1 - Replicator companies and cities present their challenges and context (45min) and identify the measure they would be interested to replicate. - Focus on: Bring HD, City of Bergen, City of Stavanger - Assess condition for replication (staff, finance, time, technical conditions, legal frameworks etc (30 min) - *Split into groups*
12:30-13:30	*Lunch*
13:30-15:30	Replication Workshop part 2 - Reflect on actionable steps (1h) - Feedback session (45min) *Reconvene into plenary*
15:30-17:00	Visit of the delivery location - Stortorvet (Stortorvet 7, 0155 Oslo)