

Mobility Lab Helsinki – summary and insights from a smart mobility testbed



**Business
Helsinki**

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1 INTRODUCTION

This final report of Mobility Lab Helsinki (2022-2024) describes the activities of the smart mobility testbed, including its service models, benefits, and challenges. The report supports testbed and living lab operators and other service designers promoting innovation activities. The material is based on experiences accumulated during the operation and an external impact assessment carried out by Demos Helsinki Oy at the end of 2024.

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2 MOBILITY LAB HELSINKI – WHAT, WHY AND FOR WHOM?

2.1 HELSINKI AS A TESTBED FOR SMART MOBILITY

Helsinki aims to be an attractive place to test new solutions in an urban environment. This is promoted through the Testbed Helsinki¹ initiative, which develops the city as a test platform. From 2022 to 2024, the smart mobility thematic area of this test platform activity was carried out under the name Mobility Lab Helsinki. It was implemented as a project funded by the city's innovation fund², in collaboration between Business Helsinki and Forum Virium Helsinki. The project continued the smart mobility testbed activities conducted under the name Jätkäsaari Mobility Lab from 2019 to 2021.

2.2 OBJECTIVES AND PURPOSE

The primary goal of the activity is to strengthen the city's economic base by enabling companies' research, development, and innovation activities (RDI) and creating a knowledge base. Mobility Lab Helsinki supports companies in testing new solutions in a real urban environment and develops a data base and opportunities for the development of digital services.

As a result, Mobility Lab Helsinki has contributed to the city's attractiveness as a business location, serving as a marketing asset in investment promotion activities and attracting international actors to Helsinki. The activity aims to facilitate the emergence of new companies, jobs, and business activities. The development and testing of new solutions also bring new, better services to both the city and its residents.

Mobility Lab Helsinki has served as an umbrella for individual and separate smart mobility experiments and RDI projects. The aim is to better utilise project synergies and bring continuity and efficiency between individual projects and experiments, as well as network the actors involved to create new collaborations.

¹ Testbed Helsinki: www.testbed.hel.fi

² City of Helsinki's innovation fund: <https://www.hel.fi/fi/paatoksenteko-ja-hallinto/tilavaraukset-ja-avustukset/innovaatorahasto>

2.3 TARGET GROUPS AND FOCUS AREAS

The target group of Mobility Lab Helsinki includes companies, but also other entities engaged in research and innovation activities, such as universities. The testbed activity supports actors with new innovative solutions that need to be tested in a real operational urban environment. The actors can be small or large, local, domestic or foreign. Especially for smaller actors, the testbed can offer a unique opportunity to receive feedback on their solutions in the early stages of development. On the other hand, larger actors can validate new development and business ideas. For international companies, it offers an opportunity to familiarise themselves with the local operating environment.

The central focus of Mobility Lab Helsinki has been on digital twins and data related to mobility. Regardless of this main theme, the activity encompasses a wide range of new services and technologies under the term smart mobility or intelligent transport, from mobility services to logistics.

Given the broad target group, one of the goals was to reach a diverse range of actors. During the activity, approximately 150 different companies, 20 research entities, and 50 public entities (e.g., cities, associations) participated in events organised by the project. If the numbers included events co-organised with other actors, visiting delegations to whom the activities were presented, and direct discussions with individual entities, the number would multiply, especially with international actors.

2.4 EXPERIMENTS 2022-2024

During the activity, various experiments were supported and enabled. The role of Mobility Lab Helsinki in the experiments has varied from being the main organiser to providing general support and facilitation, as well as building cooperation. The activity was seen to have facilitated the creation of 15 new RDI cooperation initiatives (e.g., EU projects or other company development projects whose creation or implementation was enabled by the activity). A total of 17 companies participated in experiments carried out as service procurements directly facilitated by the activity, and 10 companies participated in experiments based on company-driven ideas. The following table summarises the experiments. The implementation models are described in more detail in the chapter on the operating model and services.

Mobility Lab Helsinki experiments 2022-2024.

Companies	Topic of test	2022				2023				2024					
Nodeon	Using LIDAR for situational awareness of traffic and C-ITS														
Soilita	Using smart junction data for traffic modelling														
Daimler	Using data collected by vehicles for monitoring the traffic environment														
Callboats	Electric and autonomous water transport														
Xyzt.ai, Geomobility (+ Telia)	Analysis and visualisation tools and testing use of different traffic data sources														
Normiopaste	Collecting data about traffic signs														
Marjetas Academy	Mapping of traffic signs and changes in them														
Sitowise	Three-dimensional modelling of the street environment														
Zero Gravity	Three-dimensional modelling of the street environment														
Drover, Voi, Vianova (+VTT)	Analysis and nudging of e-scooter use behaviour														
Flow Analytics	Traffic flow analysis using combined data from multiple LIDARs														
Telraam	Crowdsourced traffic data collection with cheap sensors														
Technolution	Producing anonymised bicycle use data														
Gispo	Integration of 3D materials into QGIS														
Webion	Observation of the urban space with machine vision solutions														
Sitowise	Automatic categorisation of traffic control objects														
MarshallAI	Machine-vision for collecting data from bicycle parking														
Bikeloop	Smart and modular bicycle parking														
Skoda	Anti-collision sensing and warning system for a tram														
Omni Audio	Audio-guidance virtually and with indoor-positioning e.g. for the visually impaired														
Dreamwaves	Crowdsourced and semi-automatic accessibility data collection with AR														
Cadweiser	Real-time, multi-lingual traffic notifications using AI														
NinjaLABO	Utilising traffic data and APIs with no code vision LLM														

3 CITY AS A TESTBED AND DATA AS A RESOURCE

3.1 CITY AS THE TESTBED

The principle of Mobility Lab Helsinki – and more generally Testbed Helsinki – and its difference from many test environments is that the entire city serves as the test platform. The aim of the test platform activity is to enable experiments in a real urban environment rather than in a restricted or closed test environment. The difference in approach compared to various test tracks and closed laboratories is that the experiments produce experiences specifically from a real operational environment and real use situations. Instead of inviting test users somewhere, the experiments are brought to them. Since 2019, the central location for intelligent transport experiments in Helsinki has been the Jätkäsaari and West Harbour area, although experiments are not limited to this area if it is more appropriate to conduct them elsewhere.

General openness to all kinds of solutions and, on the other hand, an unrestricted location means very diverse possibilities. However, due to the varying needs and requirements of different implementations, each case must be considered individually: is it possible, where, and how.

3.2 DIGITAL TWINS AND DATA AS THE BASIS FOR NEW SOLUTIONS

One of the main focuses of Mobility Lab Helsinki has been digital twins for mobility and, more generally, traffic data as the basis for new services. The fundamental idea is the concept of open data and interfaces, i.e., facilitating the development of services as diversely as possible. Through experiments and product development carried out by companies, the project investigated and developed data related to city models (e.g., CityGML 3.0 and its transport module) and tools for producing and utilising this data. Thus, companies were able to develop their own services and test their ideas while the city and other actors learned about new data opportunities.

Mobility Lab Helsinki produced a working document on digital twins of mobility³, which describes what is meant by a mobility twin in Helsinki, the related ecosystem, data sets with their different parts (information on traffic flows, traffic infrastructure, and context and changes), as well as the related challenges and potential uses.

While Helsinki Region Infoshare⁴, as the open data service for the Helsinki metropolitan area, is a place to find data about the region, which can be freely utilised by everyone, Mobility Lab Helsinki advanced the usability of data further in the form of the Mobility Data Catalog⁵. It aimed to describe the data sets in a structured way, making it easier to find and use essential and useful information. The main purpose of this was to make data sets generated through more experimental and test activities available, whereas HRI mainly focuses on more official data sets.

³ Digital twins for mobility working paper. Available from the Smart Mobility section of Testbed Helsinki. <https://testbed.hel.fi/alyliikenne/mobility-lab-helsinki/>

⁴ Helsinki Region Infoshare (HRI). <https://hri.fi/>

⁵ Mobility Data Catalog available at Forum Virium Helsingin website. <https://forumvirium.fi/esittely/data/>

4 APPROACH AND SERVICE MODELS

4.1 CONTACT POINT: CASE-BY-CASE PLANNING AND IDENTIFICATION OF ACTORS

The basic premise of the activity is to enable and support the testing and development of new solutions in an urban environment. The conditions and support needed for various experiments vary significantly. Similarly, the implementation methods of co-development depend on the solution, objectives, desired scope, funding needs, etc. Therefore, collaboration opportunities are considered on a case-by-case basis rather than handling proposals automatically.

The first step in discussing experimentation opportunities is understanding the operating environment and the actors involved. Initially, the aim is to identify the right and relevant parties for the experiment. Finding an interested stakeholder or potential user is a prerequisite for a useful experiment and obtaining valuable insights and feedback.

An essential part of the activity is acting as a contact point for companies. This addresses the challenge often experienced by smaller companies that it is difficult to get in touch with cities. Through discussions, the aim is to identify whether there is likely interest in the idea or solution and with whom the matter should be advanced. Especially for foreign actors, understanding the operating environment and the roles of the city and regional actors saves time and facilitates the right approach.

Experiments are implemented through different paths. Broadly, these can be divided into three categories: company-driven experiments, experiment calls, and joint projects.

4.2 COMPANY-DRIVEN EXPERIMENTS AND IDENTIFICATION OF TARGET GROUPS

Company-driven experiments are cases where solutions are tested based on companies' contacts and proposed ideas. In these cases, the role of the testbed is specifically enabling, meaning that typically the company is not seeking funding for implementation but rather needs a location and other support. For example, the company may have its own development budget, a project funded elsewhere, or another stakeholder or customer funds the implementation. In justified cases, the test platform may also participate in covering costs if the uniqueness and need for the solution are justified.

4.3 INNOVATION CHALLENGES AND IDENTIFICATION OF NEEDS

Innovation challenges – or open calls for agile piloting – are a means by which the test platform sets an open challenge seeking innovative solutions. The challenges are typically defined based on the current needs of various city units or other city-related entities, such as municipal enterprises (e.g. harbour, public transport authorities). Topics and challenges are also identified based on citizen engagement and feedback. In addition to acute needs, the inspiration for challenges can also come from identified trends in new solutions whose utilisation or co-development would be valuable for the city. This can particularly focus on new solutions that the city has not yet prepared for within the framework of regular operations, such as electric scooters or urban aviation, which have appeared on a market-driven basis. Forum Virium Helsinki's guide, Pocket Book for Agile Piloting⁶, based on the lessons from the Smart Kalasatama and Mobility Lab experimentation activities, provides a model for quick and lean challenge-based experimentation.

⁶ Pocket Book for Agile Piloting. <https://forumvirium.fi/en/publication/the-pocket-book-for-agile-piloting/>

4.4 NEW JOINT PROJECTS AND UTILISATION OF SYNERGIES

Joint projects and, for example, applying for EU funding are typical options for larger, longer-term, and more research-oriented cases. The testbed activity can support and provide frameworks and location for the practical implementation of experiments to be done in projects. Utilising project synergies is an essential means of enhancing individual projects, e.g., by providing base data in the form of data sets from other projects and previous experiments, and bringing continuity to the results and lessons of the projects.

4.5 SUPPORT FOR IMPLEMENTATION OF EXPERIMENTS

Project management and collaboration between the parties involved in the experiment, communication, and user engagement are aspects to be considered in all tests and pilots. The testbed activity provides practical support and experience for their implementation. Thus, for example, both the experts from the city and other challenge owners, as well as the experimenting companies, receive support for practical experiment organisation and can focus more on their expert roles and defining the objectives of the experiments, as well as monitoring results and providing feedback.

Permits and locations are typically the first practical matters to consider when planning to test new solutions in urban space. The city acting as a testbed does not mean that existing rules or permit processes can be bypassed for experiments, or that a suitable space can always be arranged for them. However, it means that the relevant aspects are considered together with the actors, and the right permit processes and potential locations for practical implementations are identified.

Practical installations and their planning often require multifaceted collaboration. The role of the testbed is typically to coordinate planning and contact, bringing together, for example, city departments, experimenting companies, and contractors carrying out installations. Since the testbed activity is openly defined without strictly defined frameworks (i.e., seeking suitable locations for very different services in the city rather than giving specifications of what can be done and where), planning often starts with basic clarifications and identifying the right responsible persons.

4.6 USER ENGAGEMENT

A key purpose of living lab-type activities is to provide a contact point for users and receive feedback from them. Permanent or recurring experimentation in the same environment – whether it is a neighbourhood, station area, or vehicle – creates familiarity among those moving in the area and enables the establishment of communication channels such as email lists and joining local social media channels. Compared to random self-initiated development campaigns by companies, a more well-known city-driven testbed is easily perceived as more credible and trustworthy, lowering the threshold for participating in the experiments.

4.7 NETWORKING, INFORMATION EXCHANGE, AND CONTACTS

The testbed activity brings together city experts and companies through the implementation of experiments or discussions about their ideas. Joint events, for example, between experiments operating in the same field, bring together industry actors and often create good connections between companies doing the pilots and development. Events, presentations in various contexts, visiting delegations, and participation in joint booths at events, etc., also bring visibility and recognition to the experiments done and the companies behind them. Testbed and living labs is a topic that attracts many international contacts to the city, seeking to learn about both the piloted solutions as well as the testbed practices. Visibility and a recognised position as a pioneer in innovation activities provide good opportunities for exchanging best practices and solutions, as well as collaboration with international actors and cities.

Experiment opportunities are crucial for start-up companies, which need practical experience and proof of their ideas to communicate to investors. Therefore, collaboration with start-up incubators and accelerators opens new connections and opportunities for the creation and growth of new businesses. Similarly, experiences and insights into diverse new solutions and city challenges provide useful understanding, which is occasionally utilised to support universities in planning course topics or lectures.

5 CHALLENGES AND REALITIES

5.1 PHYSICAL SPACE AND INSTALLATIONS

Dedicated test environments, such as specially equipped facilities or vehicles, are easier to communicate and evaluate than finding a suitable location on a case-by-case basis. However, this limits the possibilities based on the available settings. Finding suitable places and generally having access to urban space is often a significant challenge. Space is typically the most critical resource in cities, and urban space is intended for its designated use – such as open market squares – rather than being a playground for commercial actors. The role of the experimentation activity is to try to align temporary experiments and learning from solutions that meet the city's own goals with the development needs of companies. Post-experiment implementations and space usage naturally require their own handling. From a spatial and permit perspective, it is worth considering whether public space is the most suitable place for the experiment or whether private areas, such as shopping centres, might be more practical.

Choosing locations and planning installations often require collaboration among many actors, which takes time. Complexity and the possibility of e.g. obtaining electricity can significantly impact delays and make finding a suitable location difficult.

5.2 SCOPE AND EXPECTATIONS FOR THE EXPERIMENTS

For the impact and significance of results and credibility, it is important to consider the goal of the experiment and the scale at which it should be implemented. Small-scale experiments can produce preliminary results and observations that are valuable, especially in validating early-stage concepts for further development decisions. Obtaining credible and statistically significant impacts, on the other hand, often requires much larger implementations in terms of both time and area.

It is also important to be aware of the risk that a poorly or too narrowly implemented experiment produces poor results, which can create the impression that the solution itself does not work. This can pose challenges for experimenting with the same or other similar solutions due to the perception that "this has already been seen and it didn't work." Overall, managing expectations and setting realistic goals from the beginning is crucial.

5.3 AVAILABILITY, SUFFICIENCY AND USABILITY OF DATA

For data-driven services, it is necessary to consider whether there is enough data, if there are gaps, and if there are challenges related to its accuracy. For example, in terms of the city-level traffic situation awareness, the data level may be spotty (e.g point-based measurement locations rather than continuous coverage) or incomplete for different modes of transport, so weaknesses must be understood and considered in the evaluation and conclusions of the experiment. The availability of data as open or commercial, as well as usage rights and restrictions due to information and privacy protection, can also be obstacles.

For services that produce or utilise data, information and privacy protection (e.g., GDPR⁷) must be considered. Data handling must be careful if it potentially contains personal data, which broadly includes various registers, such as facial or license plate recognition and other information linked to individuals. Time should be allocated for privacy assessments and risk evaluations related to these and ensuring the feasibility of implementation before experiments. Even if similar or specific solutions have been implemented elsewhere, the interpretation of risks and what is ok varies by actor.

In experiments and procurements, it is good to carefully consider the terms and practices related to data usage rights if and when the goal is broader and more open utilisation of data. Contracts should detail the scope of usage rights (e.g., free redistribution, copying rights, further processing rights, publication rights). It is important to ensure that the contract does not limit usage rights too narrowly to a specific purpose without a valid reason but allows for broader uses. Especially for shorter experiments, but also in general, it is important to consider data usage rights even after the contract has expired. Anonymising data when necessary increases its usability.

5.4 IDENTIFYING NEEDS AND RESOURCES

A new idea alone is not enough to initiate a useful experiment if a corresponding need is not identified. In the case of company-driven experiments, the first challenge is typically finding a stakeholder (i.e. the right person, department or organisation) with a genuine need for the matter. Experiments should not be conducted just for the sake of experimenting, and it does not serve any party if the right experts are not involved in providing feedback and, on the other hand, learning from it.

Superficially similar solutions are often encountered. Therefore, the testbed can serve as a good initial point for discussing ideas and advancing suitable ones. The testbed approach has received much praise from especially startups for the opportunity to discuss with the city, as getting responses can often feel hopeless.

It should be noted that experiments are often additional work for experts in different subjects. A genuine need for better solutions brings motivation for the idea, but even then, the right and sufficient time for doing it must be found. Separate funding needs naturally bring their own challenge in obtaining it.

One challenge in selecting experiments is that there can easily be multiple similar solutions. It is necessary to critically consider whether implementing similar experiments is confusing from the users' perspective or whether comparing different options is valuable in itself.

In experimentation activities aimed at accelerating innovation, it is essential that the actors offering solutions are genuinely engaged in development. The nature of experiments is to learn and develop new things. If a company sees the experiment purely as a traditional solution delivery, the lessons are easily weak, and the activity can feel forced. This should be considered, especially in innovation challenges and agile pilot calls.

5.5 FINDING TEST USERS

Although the idea of living labs is to engage users and receive feedback from them, it must be recognised that finding test users is often challenging. Reaching larger audiences, in particular, is a significant challenge that must be considered in setting goals and especially in communication planning. Based on the goals of the experiment and user groups, the right channels and places for reaching users must be considered (e.g., resident groups, visible advertisements, student groups, social media, traditional media, pop-up events, etc.).

⁷ General Data Protection Regulation (GDPR). <https://eur-lex.europa.eu/eli/reg/2016/679/oj/eng>

In principle, those who see the tested services as genuinely useful and interesting for themselves will use them and provide feedback. Campaigns and incentives, such as gift cards to local restaurants, cinemas, etc., can be used for engagement, but their implementation must also be planned and resourced sensibly.

A critical consideration is the quality and maturity of the service being tested. If the user experience is difficult or unclear, usage often stops there, and user experiences do not develop. A poor user interface can result in feedback and the perception of the service's functionality being weak, even if its core functions are as desired.

6 BENEFITS AND IMPACT

6.1 BENEFITS FOR COMPANIES

The most direct benefit for companies utilising a testbed is the development and acceleration of innovation activities. Besides testing technical feasibility, practical experiments provide an opportunity for good dialogue with potential customers, experts, and users. The development process receives quick feedback on what works and any misconceptions about needs and usage.

Practical experiments are a good way to gain visibility and initial references for solutions. In addition to the actual experiment period and demonstrations, a testbed often communicates widely to various parties about the tested solutions and, at the same time, about the companies behind them. This helps in reaching new contacts and potential customers.

Even without an actual experiment, dialogue with testbeds helps understand previous experiences and the operating environment with its actors and challenges. Understanding the operating environment is essential, especially for new companies or those coming from elsewhere (e.g., what needs, constraints, challenges, and actors exist in the area; such as service providers, legislation, winter conditions, etc.). Discussions also help identify synergies with other development projects and potential partners.

According to the impact assessment conducted by Demos Helsinki, the experiments were particularly beneficial for long-term learning, product development, and strategic direction of companies, even though the immediate economic impacts were smaller.

The experiments supported the verification of product usability and helped identify development areas, which supported product development and commercialisation. Testing in a real urban environment revealed potential problems with products and provided valuable information on what works and what needs further development.

Experiments and collaboration with the City of Helsinki increased the visibility, credibility, and marketing opportunities of companies. The city's own data provided companies with a competitive advantage, as other actors did not necessarily have access to (or awareness about) it.

Companies were able to use the experiments to assess whether it was sensible to develop the idea further or if resources should be directed elsewhere.

Follow-up survey results showed that the true value and impact of the experiments might only become apparent over a long period and are often not immediately assessable after the experiment ends. Therefore, it is good to keep in mind that evaluating innovation activities too early can lead to conclusions that give a weaker impression of the benefits than reality.

6.2 BENEFITS FOR THE CITY

From an economic policy perspective, the significance of the testbed lies in the creation of new business and commercial activities through the acceleration of, and support for, innovation activities. Additionally, the activity and leadership in development increase the city's recognition and attractiveness as a place for companies to conduct innovation activities.

Experiments and continuous collaboration with companies developing new solutions increase the city's knowledge and expertise. Experiments provide information on the state-of-the-art in various fields. It is an agile way to see if solutions have the potential to address the city's challenges or do things in new ways. Through experiments, it is possible to proactively gain valuable insights into new solutions, so that the best solutions can be adopted, for example, through future procurements, and the city can prepare for the future and guide development in the desired direction for less clear cases. Experiments often also generate new data for both the experimenters and the city, as well as a basis for new development.

6.3 BENEFITS FOR CITIZENS

Ultimately, the purpose of the solutions being tested is to be implemented and improve people's lives. Engaging users in the development activities helps create services that interest people. On the other hand, solutions that improve traffic management or planning, for example, make people's lives smoother. Information or coffee sessions organised for citizens to present the experiments, as well as participation in events and festivals aimed at residents, bring the activities closer to people. This enables discussions about everyday challenges and the consideration of new services directly related to needs.

7 SUMMARY AND RECOMMENDATIONS

In addition to the approach and services described in the report and the related benefits and challenges, we recommend considering the following perspectives in the test platform activities to maximise impact. The recommendations are based on the impact assessment conducted by Demos Helsinki and the experiences, insights and observations accumulated during the activities.

1. Clarifying the objectives of the testbed

To increase impact, it is essential to clarify which problems the activities aim to address. The testbed activities and their objectives can be directed either towards a) promoting traffic and climate goals or b) supporting economic policy goals.

a) Supporting Traffic and Climate Goals:

- Prioritise topics that support emission reduction goals: test zero-emission mobility solutions, improve traffic flow, collect data to support planning and decision-making with clear objectives.
- Direct activities towards large, established companies that offer concrete and mature, already scalable solutions to the city's challenges.

b) Strengthening New Business and Local Start-ups as an Economic Policy Goal:

- Provide start-ups with piloting and reference opportunities.
- Help companies find their first customers.
- Promote networking with international start-up incubators and ecosystems.
- Support the commercialisation of innovations and the creation of new jobs and business models.

2. Stronger commitment from city departments

To address the challenge of identifying genuine needs and actively involving the right experts, stronger involvement and commitment from the relevant departments is key to impact. Individuals focused on active innovation activities within their substantive work can facilitate the identification of acute challenges and make it easier to find time for planning experiments.

- Develop clear structures within the city organisation that support continuous learning and linking business cooperation to strategic goals.
- Promote the commitment of departments to experiments so that they are perceived as their own, supporting continuity and broader utilisation of results.
- Hire a project person within the city department to strengthen the city's commitment.

3. Deepening co-development with partnership models

As a general perspective on business cooperation, various longer-term partnership models and jointly defined visions and clear goals can help engage actors in development work. This is particularly linked to traffic and emission reduction goal-oriented development, through which motivation and real implementation opportunities arise.

- Implement partnership models, such as lifecycle and alliance models, to support co-development between the city organisation and companies.
- Bring together city departments, research institutions, and companies to solve common problems.
- Support business cooperation with a low-threshold participation model that connects large companies, start-ups, and research organisations.

4. Supporting commercialisation and follow-up paths

A familiar challenge and concern in all project-based activities is what happens after they end: how to advance good ideas and solutions towards implementation, commercialisation, and scaling. Depending on the target group (e.g., start-ups vs. larger companies), support services and follow-up paths should be considered already before experiments through clearly defined mutual goals. Managing expectations and understanding what the experiments aim to learn and, on the other hand, what restrictions related to public procurement rules exist for follow-up are essential for useful results and satisfied participants. From the beginning and throughout the experiment, it is worth considering whether the goal is, for example, a follow-up development project or the idea of communicating and marketing the results to certain parties.

- Promote innovative procurements and innovation partnerships linked to the city's strategic investments.
- Include research and development services and product piloting in the procurement processes.
- Allocate part of the tenders to start-up companies.
- Utilise partnership models.
- Provide companies with resources, expert support, and tailored follow-up paths for developing business models and, for example, internationalisation.

5. More precise allocation of resources

Focusing activities in terms of operating models, topics, and the scope of implementations is always a matter of choice. In allocating resources, it is worth considering what you mainly want to achieve and, on

the other hand, what the choices may exclude. Concentrating activities on fewer but larger experiments increases potential impact and the credibility of the experiments. On the other hand, it also limits the number of participants and may reduce opportunities to support experiments, especially for early-stage ideas and start-up actors. Similarly, a precise thematic focus (which is often typical for individual projects) leaves less room to listen to and support entirely new and more transformative solutions.

- Allocate funding to larger and more impactful experiments, supporting long-term product development and commercialisation.
- Concentrate resources on the city's strategically important goals and tighten the focus of experimentation programs.
- Maintain partially separate funding for smaller, company-driven experiments that are not directly related to the city's procurement needs and support the promotion of company-driven innovation activities.

6. Evidence-based impact assessment framework for the experiments

The primary goal of small-scale experiments is often to produce initial experiences and hints about whether the tested solution is promising, whether the initial assumptions are correct, and whether it is worth further developing or testing more extensively. More credible and investment decision-supporting results require sufficient scale of experiments and proper impact assessment. If the goal is genuinely to demonstrate impact with the experiment, an evaluation work should be added, which naturally requires its own resources.

- Develop an impact model in collaboration with city departments, committed to the city's strategic goals.
- Provide each experiment with a clear evaluation framework and easy-to-implement follow-up for companies during the experiment phase, as well as support for impact assessment.
- Conduct impact assessments by an external party.
- Create references for local and international markets through communication.

7. Strengthening networks

Network activities in various forms have been found useful from the perspective of both companies and other actors. Various events, presentations of experiments, and bringing actors together add significant value for creating new partnerships. Through the test platform activity, it is possible to offer visibility to the activities of participants in various networks and forums.

- Long-term cooperation with existing networks and promoting international cooperation.
- Regular matchmaking and demo events.
- Clearer commitments between the city and companies, such as joint projects aimed at commercialisation.