

Agile pilots for the development of a digital twin for mobility (Mobility Lab Helsinki)

INVITATION TO TENDER 8 NOVEMBER 2023

Procuring entity

Forum Virium Helsinki Oy

Background information

Mobility Lab Helsinki expedites companies' creation of new business activities, products and services by promoting the development of Helsinki's digital twin for mobility, information models and data resources and supporting their effective utilisation. The project is being carried out by the City of Helsinki and Forum Virium Helsinki.

Agile pilots are our way of developing a new and even more functional city in a genuine environment together with residents, businesses and experts.

Read more about agile pilots: <https://forumvirium.fi/en/about/agile-pilots/>

Forum Virium Helsinki will carry out the pilot procurement as part of the Mobility Lab Helsinki project. The objective of the pilot procurement is to serve the overall development of the city's digital twin – to explore and test new methods, such as artificial intelligence, for the information modelling of the current state of street environments and street asset management.

The results of the pilot procurement will be used for the implementation of the CityGML 3.0 street environment test data in 2024. CityGML 3.0 facilitates the representation of the traffic environment as centre lines, point clouds, 3D surfaces and spaces. More information: <https://tum-gis.github.io/road2citygml3/>.

The aim of this work is to interactively create a broader understanding of the potential of the new standard for companies, researchers and developers.

Detailed description and subject of the invitation to tender

With this open invitation to tender, Forum Virium Helsinki Oy is seeking one or multiple supplier(s) to carry out pilots.

The pilot call is looking for a wide range of solutions with high novelty value.

- New methods
- Technical novelty value
- Use of open source
- Scalability

The City of Helsinki has identified a clear need for more accurate and up-to-date information on traffic control equipment, including street elements such as barriers, road markings, traffic signs, traffic lights and signs. Based on the identification of this need, the City stresses the importance of collecting data for a variety of purposes, including as source data for planning, for ordering work and for validating existing street assets on site.

At the same time, the CITY of Helsinki aims to improve its asset management by gaining a better understanding of where different elements of its street assets are located. The information collected will support not only the ordering of works, issuing permits and monitoring, but also navigation and other digital services.

The City of HELSINKI has also carried out an analysis of its current situation and found that some implementation data is scattered across different systems or missing altogether. For this reason, the City aims to centralise this information in one place, making decision-making and planning more efficient. The City of HELSINKI calls this platform CityInfra.

The new solutions to be tested can relate to themes such as the following:

- a method for identifying and classifying street traffic conditions or equipment as 3D geospatial data, for example by using new AI methods to analyse the point clouds of a mobile laser scan to identify lanes and street equipment
- a method for generating line data on the centre lines of traffic lanes, for example by developing an identification method based on point clouds from mobile laser scanning for an open source application
- a method for supporting street equipment maintenance processes, such as a crowdsourcing traffic sign validation using mobile application
- a method for combining existing geospatial data into useful new data, such as using mobile laser scans of the street space to refine street spaces in the city model
- development of the automatic classification of the point clouds of street & airborne laser scanning, for example by crosschecking the consistency and quality of the classification of different datasets
- improving the combined viewing of street view and city model data, for example by developing methods for presenting 360 images on city model

presentation platforms (Cesium).

Source data

The pilot can make use of existing open/paid data or carry out new measurements, as long as all the work and data acquisition costs are included in the tender. The tender must justify the use of paid data and detail the costs of acquiring it.

The pilot will offer the possibility to use the mobile street space laser scanning & 360 street view data from the Jätkäsaari area produced in an earlier Mobility Lab Helsinki pilot (Cyclomedia, October 2022). The quality of the data is similar to that acquired by the City of Helsinki for over 1,000 km of its street network during the summer of 2023. The data also includes elements and areas of street space that have already been interpreted as geospatial data.

A limited preview version of the data will be available for viewing before the deadline for the submission of tenders. To ask for the preview version, please contact jukka.alander@forumvirium.fi. The full dataset will only be made available to the selected companies once the pilot has started.

Mobility data is processed in Mobility Lab Helsinki's Mobility Data Catalog:
<https://mobilitylab.hel.fi/data/>

Helsinki City Models:

<https://www.hel.fi/en/decision-making/information-on-helsinki/maps-and-geospatial-data/helsinki-3d>

Helsinki's open geographic datasets:

<https://www.hel.fi/en/decision-making/information-on-helsinki/maps-and-geospatial-data/make-better-use-of-geospatial-data/open-geographic-data>

Pilot objectives

The aim is that the test data produced will later be available for use by the client (Forum Virium Helsinki and the City of Helsinki) in the production of CityGML 3 test data in 2024.

A free-form report of the work must be submitted in PDF format, explaining the methods used to produce the data and how the data was processed. The report must describe how the pilot relates to the data structures of CityGML 3 and its Transportation Module.

The new data produced/measured in the pilot must be provided in an appropriate geospatial data format in accordance with OGC standards, such as GeoPackage, LAS/LAZ, 3DTiles or similar. The coordinate system to be used is the GK25FIN coordinate system and the N2000 height system, and the unit of measurement is metres.

In addition to any measured data, the source data used must also be provided, which may include data such as the following:

- terrain data measured by different methods
- geospatial data (e.g. base map)
- plan information (e.g. 2D street plans and traffic plans)
- point clouds (e.g. mobile scans)
- street view or oblique aerial photos
- terrain models
- area boundaries, break lines (mapped, digitised) and attribute data used for classification
- centre line data.

The exact area will be agreed upon together with the selected operators.

The pilot results and lessons learned will be presented by the participating companies at a final event organised by Mobility Lab Helsinki. The event will take place after the pilots are over. The results and lessons learned will also be shared more widely at future Mobility Lab Helsinki events.

A maximum of three (3) pilots will be selected for the pilot round. Forum Virium Helsinki reserves the right not to select any pilot.

Who can participate?

The invitation to tender is open to organisations with a valid European business ID. The personnel and administration of Forum Virium Helsinki Oy and their interest groups are prohibited from submitting tenders. Participation as a group ('team') is possible. In this case, the team will appoint a company from among them to act as the contact party for this tender. This company will also serve as the procurement contract party. The procuring entity requires the procurement contract to be signed with a single supplier, with the other parties named in the tender allowed to serve as its subcontractors.

Timetable of the tender process

The deadline for the submission of tenders is 4 December 2023 at 16:00 (Finnish time). The tenders will be evaluated by 8 December 2023. All tenderers will be informed of the tenders selected for the pilot.

The pilots will be carried out between 2 January 2024 and 2 April 2024. The duration of the pilot may not exceed three months.

Tenders must be submitted by using the dedicated tender form:

<https://fvh.io/mlh-agile2023>

In addition to filling in the form, tenderers must submit their actual tender as an attachment. Furthermore, each tenderer can submit a maximum of three (3) other attachments supporting their tender.

Procurement price

The total budget of the procurement is up to EUR 45,000. The maximum number of pilots is three (3). The maximum cost (price ceiling) for one procurement/pilot is EUR 15,000, VAT 0%.

Providing the prices as a range is not allowed. Forum Virium Helsinki Oy will not commit to covering any costs or expenses not included in the tender (e.g. accommodation or travel expenses). The procurement price must cover the implementation of the service in its entirety, including costs resulting from insurance and permits, as well as taxes and charges levied by the authorities, for example.

Tender evaluation procedure

The winning tenders will be selected by the evaluators based on scores assigned in accordance with the evaluation criteria.

The procuring entity has the right to decide not to carry out the procurement, considering factors such as the total funding available.

The final selection will be based on the evaluation criteria.

All tenderers will receive an email announcement of the results and reasoning.

Evaluation criteria

For the purpose of evaluation, tenders submitted will be scored according to the following formula: The procurement criteria are 10% price and 90% qualitative assessment, on a scale of 1–10.

The tenders will be evaluated on the basis of the following qualitative evaluation criteria, taking into account the stated weightings: 1) novelty and innovativeness (30%), 2) feasibility (30%), 3) impact and effectiveness (30%).

Price is scored as specified above.

Each evaluation criterion is scored on a scale of 0–10 points. The points for each of the evaluation criteria will be stated in accordance with the criterion's weighting. The maximum total score that a tender can receive is 100 points (including the price score).

Evaluation criteria scoring

1. The pilot's novelty value and innovativeness (max. 30 points in total)
 - The novelty value and innovative qualities of the service or product (evaluation is carried out based on the personal competence and general and special know-how of the members of the evaluation panel selected by the procuring entity).

- The pilot brings new practices/solutions/perspectives to the modelling of street and urban space.
- What does the pilot implementer think that they will learn as a result of the pilot?

2. Feasibility (max. 30 points in total)

- The description of measures, timetables and resources shows that the service can be implemented in a high-quality and safe manner, within the agreed timeframe and at the location specified in the invitation to tender. Feasibility will be evaluated on the basis of the work plan submitted.
- The competitor demonstrates that they have sufficient competence and resources to implement the service. Competence of the personnel assigned for the pilot project, e.g. CVs or other characterisations and support material.
- Other partnership arrangements (the implementing team, subcontractors and collaboration with the sector or other operators, for example) are described well.

3. Impact and effectiveness (max. 30 points in total)

- The intended impact of the service/method and the method to verify the impact are described clearly.
- The service can be replicated or reproduced.
- The solution to be tested will create new opportunities, methods or practices for collecting, combining and utilising data.
- The code produced in the pilot is open source and documented on GitHub or a similar service.

4. Price (max. 10 points)

- The calculation formula for the price comparison is this: the lowest price / the comparable price x 10 points.

Tenders evaluated to be of equal value may receive the same score. Each criterion will be evaluated as a whole. Points will be awarded to the nearest one (1) point, and the total score will be stated to the nearest 0.1 point.

In the event that multiple tenders receive the same total score, the deciding factor will be the price score of the tenders, and in the event that multiple tenders also receive the same price score, the deciding factor will be the score for the individual quality criteria in numerical order from lowest to highest.

Procurement decision and contract

The procurement decision is made based on a separate decision issued by Forum Virium Helsinki Oy. The procurement decision and its grounds will be provided in writing to all concerned parties.

A contract with the service provider(s) selected for the service is only established upon the signing of a separate contract. The procuring entity has the right to refuse to establish a contract if it becomes apparent after the issuing of the procurement decision that the service provider does not fulfil the eligibility criteria specified in the invitation to tender.

The separate contract between Forum Virium Helsinki Oy and the selected service provider(s) will be signed by the end of January 2024.

Service providers' own contract terms will not be accepted and cannot be included in tenders.

Implementation of the pilot

Each pilot will be confirmed with a separate contract and payment terms.

The price of the pilot must be indicated with VAT at 0% and will be paid based on an invoice. The pilot will be paid for in one or more instalments, depending on the scope of the pilot and the supplier's resources. The payment term is defined in the contract.

The supplier selected for the pilot will be subject to a separate reporting obligation based on the contract.

Forum Virium Helsinki will assist the supplier in finding contact persons related to their pilot project within the City of Helsinki.

As part of the pilot programme, a seminar will be organised to share the results of the pilots with stakeholders and other interested parties.

The final event of the pilots will be held in spring 2024. The companies selected for the pilots will present the pilot results and lessons learned at the event.

Forum Virium Helsinki, the City of Helsinki and its unincorporated enterprises and subsidiaries retain the right to use the pilot project and tender process in their communications.

The contract will be signed during January 2024, and the pilot period will start on that date and last for a maximum of three (3) months.

Additional information and questions related to the invitation to tender

On behalf of Mobility Lab Helsinki, participants have access to a range of background information. The information is available on the project website.

Link to the project website: <https://mobilitylab.hel.fi/open-call-12-2023/>

Questions about the invitation to tender can be submitted during the tender period. Questions on the themes and technical aspects of the pilot can be submitted until 27 November 2023 and general questions on the invitation to tender can be submitted until 1 December 2023.

All questions must be sent in writing to jussi.knuutila@forumvirium.fi (subject line: Kokeiluhaku / Mobility Lab Helsinki).

The questions asked and the answers to them will be published on the Mobility Lab Helsinki website: <https://mobilitylab.hel.fi/open-call-12-2023/>.

Information about the procurement procedure

General principles of the procurement

Forum Virium Helsinki will procure pilots to be carried out in the Helsinki region as part of the Mobility Lab Helsinki project. The procurement will be carried out in accordance with the Act on Public Procurement and Concession Contracts (1397/2016). A separate announcement on the competition will be published on the HILMA procurement service (<https://www.hankintailmoitukset.fi/en/>).

It is a public procurement falling below the national threshold.

The tender process is completely electronic. Tenderers must provide their contact email addresses.

After the end of the tender period, the tenders will be opened and evaluated. Forum Virium Helsinki Oy may request that tenderers submit, add, clarify or supplement incomplete or incorrect information and documents within a specified period. Tenders that do not correspond to the invitation to tender will be excluded from the evaluation.

Forum Virium Helsinki Oy treats all the parties participating in the tender process and other suppliers in a non-discriminatory and equal manner, operating transparently and in accordance with the principle of proportionality. After the evaluation, a decision will be issued on the procurement. The decision will include the selected supplier and the grounds for the selection.

Language

The languages of the tendering process are Finnish and English. Some materials are only

available in English. Tenders and their attachments must be submitted in Finnish or English.

Order of precedence and conflict resolution

Order of precedence:

1. The tender submitted as an attachment via the information form page (<https://oc.fvh.io/agile-pilots-for-the-development-of-a-digital-twin-for-mobility-mobility-lab-helsinki/>)
2. The information provided on the form
3. The information presented in the attachments to the tender

In the event of contradictions in the information provided:

1. Any differences between the prices presented on the form and in the attachments will result in the tender being rejected as invalid.
2. Any contradictions in the statements of price provided in the attachments will result in the tender being rejected as invalid.
3. Not including price information in the attachments and/or the form will result in the tender being rejected as invalid.
4. Not including the actual tender as an attachment will result in the tender being rejected as invalid.

The tenders must be valid until 4 June 2024.

Content of the tender

The tender must

- describe the content, quality and scope of the service
- include the total price of the service and a breakdown of the costs
- detail the equipment and personnel used for the service, and
- indicate any professional and trade secrets.

Before the evaluation of submitted tenders, the procuring entity will ensure that the tenderers fulfil the eligibility requirements:

- the good financial standing of the tenderer (the tenderer must attest in its tender that it has sufficient resources to implement the pilot)
- fulfilment of the obligations specified in the Act on the Contractor's Obligations and Liability when Work is Contracted Out.

In other words, tenderers must provide, upon request, certificates and statements of taxes paid and pension insurance premiums and any necessary insurance policies in accordance with the Act on the Contractor's Obligations and Liability when Work is Contracted Out. This obligation shall remain in effect even after the issuing of the procurement decision.

The tenderer must have sufficient financial resources relative to the scope and quality of the pilot project. The tenderer agrees to supply a statement from a credit

data institution (Suomen asiakastieto Oy or similar) at their own cost upon request.

Upon request, the tenderer must also supply Forum Virium Helsinki Oy with its financial statements for the most recent financial period. If the tenderer cannot supply its financial statements due to having only recently commenced operations, the tenderer can, upon request, supply a report of its solvency and financial standing in another manner approved by Forum Virium Helsinki Oy.

The eligibility requirements and the evidence requested to determine their fulfilment are relevant to the tenderer's capacity to provide the service being procured and have been proportioned to the nature, purpose and scope of the procurement.

The procuring entity reserves the right to decide not to carry out the procurement in its original scope due to insufficient tenders or other reasons related to the eligibility of the tenders. The entire procurement may be cancelled if the tenders are considered insufficient in terms of content with regard to the invitation to tender. Insufficient tenders include, but are not limited to, tenders that do not meet the conditions and objectives of the invitation to tender.

The procuring entity reserves the right to not accept all tenders if they are very similar in terms of content. In such a situation, the procuring entity may still select other, non-similar tenders even if they had a lower score than the similar tenders excluded from the tender process.

Tenders submitted by the deadline will be evaluated by Forum Virium Helsinki Oy's panel of experts.

Rights

The subject of procurement is a pilot as a service without materials or equipment. However, the implementation of the pilot project may require devices or other equipment.

Unless otherwise agreed, the results, lessons and conclusions from the pilot are the property of the Supplier.

Both the Client and the City of Helsinki have the right to freely use the results, lessons and conclusions from the pilot in the Client's operations and future projects. The pilot shall not affect either Party's existing intellectual property rights.

The Client and the City of Helsinki shall be free and have the ongoing right to use, amend, disclose and publish the data produced in the project without separate permission from the Supplier, for any purposes. This data includes the raw data collected during the project, the material handed over at the end of the project and any data produced or collected by the client from interfaces opened. The Supplier shall not be responsible for any errors, the quality, or derivatives of this data, or their potential impacts.

Changes

Forum Virium Helsinki Oy may change and cancel events and presentation sessions as well as change the way in which they are organised so that they are held remotely or delivered in the form of recorded materials due to a pandemic or other exceptional circumstances.

These arrangements will not affect the duration of the invitation to tender or the opportunity for operators to ask further questions electronically.

Information event

An information event on the pilot call will be held on Wednesday 27 November 2023 at 13:00–14:00 (Finnish time). The event will be organised as a live webinar.

The registration link for the webinar will be published on the website of the pilot call: <https://mobilitylab.hel.fi/open-call-12-2023/>.

Contact person

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