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Centre for Economic Development, Transport and the Environment

Urban Mobile Robotics – Call for Companies to Create Robotics Pilots

Buyer organizations	Forum Virium Helsinki Oy (Business ID 2170029-2) and Metropolia University of Applied Sciences Oy (Business ID 2094551-1)
Subject of tenders	Piloting mobile robotics solutions in challenging urban environments
Type of tenders	Open call for tenders
Submission deadline	**5.12.2025 at 11:59 PM**
Info webinar	**12.11.2025 at 10–11 AM**

1. Background and objectives

1.1. Project description

The pilots created through this call for tenders will be a part of the Urban Mobile Robotics project. The goal of the project is to co-create mobile robotics solutions for challenging urban environments and to promote the competitiveness and growth of participating companies. The project is co-funded by the European Regional Development Fund (ERDF) and Centre for Economic Development, Transport and the Environment in the Häme area and is implemented by Forum Virium Helsinki Oy and Metropolia University of Applied Sciences Oy. The Urban Environment Division of the City of Helsinki will provide the challenges and indicate the piloting areas in the city's urban environment.

The pilot program will be launched in early 2026. Its goal is to accumulate knowledge and practical expertise in using mobile robotics in challenging urban environments.

A challenging urban environment refers to areas with complex infrastructure, unpredictable pedestrian and vehicle traffic, varying terrain and changing weather that current solutions in the market can't necessarily be directly implemented to.

The pilot program will promote creating solutions to similar environments and offer an opportunity to test different solutions in an authentic urban environment. The program will be implemented in cooperation with suitable interest groups of the City of Helsinki.

1.2. The subject and goal of the tenders

The subject of the tenders is mobile robotics technology solutions suitable for the urban environment, which perform tasks in the air, on the ground, or in water.

Our goal is to find 6–9 providers to create product development pilots. Our goal is to accumulate knowledge of new and innovative solutions relating to challenging urban environments and that improve the city's services, maintenance, and decision-making. We are especially hoping to help small and medium-sized companies develop solutions to authentic challenges acutely needing to be resolved, and to promote the businesses' competitiveness and growth.

2. Themes and subjects of the pilots

The solution should relate to one or more of the following challenges and one of the following themes. The tender should clarify which of the following themes the company is providing a solution to.

Blue City – A safe and digitalized marine city

Helsinki could be the first city in the world that continuously monitors, collects samples, and guards its marine areas with the help of mobile robotics. Our goal is to create autonomous, unmanned underwater vehicles and data solutions that monitor the quality of the water, map the seafloors, and promote aquatic and marine safety.

1. Safe beaches and ports

The goal is to create an autonomous surveillance and control system that improves the safety of public beaches, ports, and marine areas. The system will detect risks and anomalies on time, monitor the movements of swimmers, and detect emergencies in real time. Robotics equipment can also be utilized in lifeguard and rescue missions, collecting things from the water, identifying foreign objects, and monitoring the condition of waterways.

2. Smarter water quality monitoring and urban runoff management

Presently, monitoring water quality is slow and sporadic. Our goal is to achieve a real-time robotics and data analysis based report process that enables a quick response to any anomalies in water quality. The desired solution monitors cloudiness, oxygen and nutrient levels, temperature, and electric conductivity of the water as well as automatically takes samples of the water for future research.

3. Separate suggestion

Participants can also submit a separate, water-based robotics solution that brings added value to the City of Helsinki and its residents. The solution must perform tasks in the air, on the ground, or in water and produce data that can be utilized by different sectors of the city, such as improving infrastructure, security, or municipal management services.

Urban Sky – A smart and controlled urban airspace

The urban airspace is a brand-new infrastructure where drones and sensors serve as a part of the city's day-to-day life. Our goal is to create a safe and controlled airspace where mobile robotics promote surveillance, maintenance, and decision-making.

1. Smarter construction site monitoring

Monitoring and controlling construction sites takes a lot of resources and usually has to be done manually. Our goal is to improve the safety, transparency, and efficiency of construction sites by monitoring their progress and any possible anomalies in real time.

2. Preventive maintenance – detecting leaks and temperature anomalies

Each year, the city loses significant amounts of energy and water due to leaks and waste heat. Our goal is to develop a system based on aerial robotics and thermal imaging that detects leaks and anomalies early and enables preventive maintenance.

3. Separate suggestion

Participants can also submit a separate, aerial-based robotics solution that improves safety, monitoring, or energy usage in the city. The solution must perform tasks in the air, on the ground, or in water and produce data that improves the city's services or decision-making.

Smart Ground – A functional and sustainable city throughout the year

A functional and sustainable city uses mobile robotics, data, and circular economy to ensure that the city's infrastructure, maintenance, and logistics work effortlessly throughout the whole year. It is the nervous system of the city, maintaining its liveliness and the smooth running of its services with no interruptions.

1. Monitoring and modeling infrastructure

A city is made up of thousands of kilometers of streets, cycle routes, and tunnels, but maintaining them is scattered and laborious. Our goal is to create a solution that monitors the infrastructure of the city and offers constant, real-time, automatically updated reports.

2. Automation and logistics of winter maintenance

From 2028 onwards, dumping snow in the sea will be forbidden. This will create a need for new means of collecting and handling the snow. Our goal is to build a preventive, data-driven robotics solution that handles the collection, transporting, storing, and melting of the snow in an eco-friendly and cost-efficient way.

3. Separate suggestion

Participants can also submit a separate, ground-based robotics solution that improves the efficiency of the city's infrastructure, maintenance, or logistics. The solution must perform tasks in the air, on the ground, or in water and produce useful data on e.g. the urban environment, traffic, or energy consumption.

2.1. Piloting locations in the city

A location will be indicated to each pilot individually. Possible locations might include the following: general areas in central Helsinki; parks, beaches and other waterfronts, marine areas; new residential areas in Jätkäsaari and Kalasatama; ports.

3. Schedule, budget, and support

3.1. Schedule

Event	Date and time
Info webinar	**12.11.2025 at 10:00–11:00 AM**
Early bird submission deadline	**15.11.2025 at 11:59 PM**

Submission deadline	**5.12.2025 at 11:59 PM**
Announcing the chosen pilots	**19.12.2025 (at the latest)**
Pilot program kick-off	January 2026
Implementation of pilots (phase 1)	1/2026–6/2026
Implementation of pilots (phase 2)	7/2026–12/2026
Tender validity deadline	31.5.2027
Additional information deadline (questions must be sent by e-mail)	30.11.2025

3.2. Budget and funding

- We have reserved an overall budget of **45.000 euros** (VAT 0%) for all participating pilots.
- The **maximum amount** reserved **for individual pilots is 10.000 euros** (VAT 0%).
- **Recommended budget:** We recommend that the budget for any singular tender be **€0–10.000** (VAT 0%) per pilot.
- Participants are asked to provide an exact number as well as an itemization for the requested funding stated in their tenders.

3.3. Expert support and resources

- Each chosen pilot will receive expert support for development and testing from **Metropolia's Robo Garage workshop**.
- The support may include e.g. engineering, machinery, and access to private testing environments.
- The maximum value of the support is **25.000 euros** (VAT 0%) per pilot.
- In summary, each individual pilot may receive funding up to €10.000 and expert support and resources valued up to €25.000.

4. Technical requirements and data handling

The aim of the pilot is to gather useful data on the urban environment, infrastructure, bodies of water, and other related fields of the City of Helsinki so that the information can be shared and applied to other service areas of the city as well.

- **Data transfer:** The company can offer its own **Application Programming Interface** for data transfer or submit the data in a different form.
- **Data formats:** Typical data formats used by the City of Helsinki include but are not limited to: **GeoJSON, CSV, TIFF, LAS, MP4, JSON, shp and gpkg**. The solution must generate UMR compatible data.
- **Types of data:** The collected data might include e.g. 3D scanning, image-based data acquisition (RGB, temperature), underwater data (sonar images, water quality), environmental IoT data, or the robot's operative data (routes, diagnostics).

4.1. Data requirements

The table below presents the data formats used by the City of Helsinki. The company can offer its own API for data transfer or submit it in a different form. There may be restrictions on the data transfer to the City's information pool.

Data related to the task		
Category	**Type of information**	**Typical formats**
3D-scanning	Geometry of infrastructure	.LAS, .LAZ, .E57, .XYZ, .PLY, .OBJ
Image based data acquisition	RGB pictures, videos, multispectral, temperature	.JPEG, .MP4, GeoTIFF
Underwater data	Sonar images, water quality, seafloor mapping, infrastructure	.MP4, .LAS, .LAZ, .JPG + meta files
Underground data	GPR radars: pipes, cables, structures	GeoJSON (analyzed objects)
Environmental IoT data	Air, weather, noise	.JSON, .CSV

Specialized environmental data	Radiation, gas chemicals, mobile network coverage	.JSON, .CSV, GeoJSON
Audio data / acoustic observations	Environmental sounds, sounds of machinery, nature sounds	.WAV, .FLAC, .MP3, .CSV (spectral analysis)
Physical samples	Underwater, soil, aerial, and surface samples (metadata)	.JSON, .CSV
Maintenance and repairs	Tremors, strain, and expansions (from external sources)	.CSV, .JSON (as time series)

Input data		
Category	**Type of information**	**Typical formats**
GIS data	Maps, location data (input or analysis)	.gpkg, GeoJSON, CityJSON, CityGML, .shp
AI derived data	Identifying and classification of objects (result of processing)	COCO JSON, GeoTIFF, .shp, Pascal VOC (XML), .txt (YOLO)
Chemical and/or microbiological analyses	Laboratory results of samples (result of processing)	.CSV, .JSON, .XLSX

Operative data		
Category	**Type of information**	**Typical formats**
Sensory fusion data	Synchronized LiDAR, cameras, IMU, GPS (raw data)	.bag (ROS), .CSV, .JSON, HDF5, .pb (Protobuf)
Route and locomotion data	Chosen routes, odometry, location	.GPX, .bag, .json, .CSV
Robot’s diagnostics	Battery diagnostics, motor data, temperature, error logs	.CSV, .log, .JSON, .bag, .prom

Activity log and decision-making	Autonomous decisions, error management	.log, .JSON, .CSV, .bag
Interaction data	Grabbing, pressure, force, manipulation	.CSV, .JSON, .bag, HDF5
Magnetic field and compass data	Bearing, location without a GPS	.CSV, .JSON, .bag
Sensor calibration data	Calibration data of cameras and sensors	YAML, .JSON, .XML

5. Participation and evaluation

5.1. Participation and content of tenders

- You can participate in the open call by filling out the following form: https://elomake.metropolia.fi/lomakkeet/46745/lomake.html.
- The participants can also submit a maximum of **four (4)** attachments or links to support their tenders. The attachments may include testimonies and/or examples of previous work cases, a visual representation of concepts, and a video demonstration.
- We ask the participants to submit a concise summary of the contents of the pilot and its implementation (in a written form or as an attachment) so that we can evaluate the price compared to the end product.

5.2. Terms and conditions for participants

- Companies and other organizations with a **valid European Business ID** can participate.
- We also accept tenders from groups or teams of different participants.
- The participant confirms that they comply with any and all current **sanctions set by the European Union, the United Nations, and the Nation of Finland**.
- **Permission to use as a reference:** The participants consent to the use of their service or pilot as an example or a reference in social media and other types of content of Forum Virium Helsinki, Metropolia University of Applied Sciences, and the Urban Mobile Robotics project.
- **Rights to collected data:** Forum Virium Helsinki, Metropolia University of Applied Sciences, and the Urban Mobile Robotics project has unrestricted access rights to all data and solutions collected or created under the project.

- The participant is responsible for informing the buyer of which parts of the tender should be processed **confidentially**.

5.3. Evaluation criteria

Forum Virium Helsinki and Metropolia University of Applied Sciences will name a jury of experts to evaluate the tenders. The tenders will be evaluated by the following criteria and emphases. Each criterion will be judged on a scale of **0–20 points**.

Criteria	Summary	Emphasis
Significance for the city	How important is the challenge for the city's urban environment and how much will the solution improve the city's services, efficiency, or sustainability?	**20%**
Technical realism	How easily can the challenge be solved with existing or future technologies?	**20%**
Innovativeness and novelty	How much does the challenge promote new solutions and business opportunities?	**20%**
Commercial potential	How likely is it that the solution can be more widely utilized in Finland and internationally (scalability)?	**20%**
Price and extent	The price of the tender compared to realism and extent of the pilot's implementation.	**20%**

5.4. Early bird advantage

Every tender submitted by 15 November 2025 will receive an additional **5 points** to their evaluation.

6. Further information and contact

Any questions regarding the tenders must be submitted by e-mail by **30 November 2025 at the latest** to **aleksis.pillai@forumvirium.fi** subject line: *Urban Mobile Robotics Call for Tenders*). All questions and their answers will be published on the pilot program's website.

Contact information

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