

FinEst Centre
for Smart Cities

SMART CITY CHALLENGE 2024

City Challenge

Max 3 pages

send to smartcity@taltech.ee by May 15, 2024

Challenge Title – AI for detecting street markings

City/county and country – Tartu City, Estonia

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1. What is the future urban challenge that would need a solution to?

Today, the challenge for local governments is to carry out various monitoring activities with limited human resources.

We see a great opportunity here to use AI to automate surveillance activities and reduce the pressure on human labour. The problem is getting worse over time.

Another important challenge is the implementation of data-based decision-making processes for municipalities and the collection, processing and management of basic data used in these processes.

A growing trend is the use of drones for data collection and service provision.

In the case of this challenge, it is important to integrate the aforementioned three components into one monitoring activity.

One of the use cases for which we are looking for an integrated solution is to identify the quality of pavement markings and, based on the received data, create work orders for updating the markings for the contractor.

Since this topic is relevant for all municipalities, we see great potential here. The AI-based approach can also be used in other supervision activities - supervision of road construction, supervision of construction permits, supervision of landscaping works, etc.



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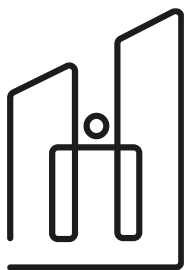


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2. Innovation.

The city of Tartu uses ArcGis software for spatial data. As far as we know, the mentioned software is used by many municipalities both in Estonia and abroad.

Monitoring of pavement markings is currently mainly done visually, where a municipal official or a representative of the contractor drives through the streets and visually records the condition of the markings. Monitoring requires the time resources of specialists and leads to CO2 emissions in transport.

In this challenge, there are the following important points that need to be resolved:

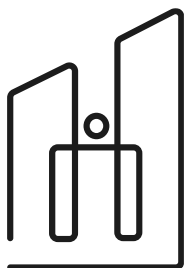
1. Regular (at least twice a year - spring and autumn) collection of spatial data (for example, using drones);
2. Analysis of the collected data using AI and definition of the wear class of road surface markings (for example, 3 classes);
3. Calculation of marking restoration volumes by class;
4. Creation of work orders in the ArcGis environment;
5. Updating the spatial data of markings in the ArcGis environment (including identification of missing markings and new markings).

3. Expected impact of your pilot solution.

Creating and piloting a street marking monitoring solution gives us the knowledge and skills to automate monitoring activities. The innovative solution makes it possible to reduce the burden on municipal employees in supervision activities and thereby use the existing human resources more optimally. The pressure to increase manpower is decreasing. Conducting the pilot creates the prerequisites for the automation of other monitoring activities.

The main benefit of implementing the solution is the saving of time resources (estimated at 30-40 hours per year) and the reduction of CO2 (estimated at 65 kg per year).





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4. Piloting

Since we see a great need for the implementation of AI-based monitoring solutions, we are ready to pilot the aforementioned street marking monitoring solution in Tartu.

We have the readiness to conduct a pilot and the ability to support with human resources.

Carrying out this pilot will allow us to gain the necessary knowledge and experience to automate other monitoring activities.



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