FinEst Centre
for Smart Cities

SMART CITY CHALLENGE 2025
Solution idea for the city challenges

Max 3 pages
send to smartcity@taltech.ee by Nov 30, 2025

Solution Idea Title (max 5 words, no acronyms) – Transport Monitoring and Enforcement Platform
Planned pilot project duration – 24 months
Main contact/-s – name, e-mail, phone, university + department or company name:

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1. Which urban challenge or problem are you planning to provide a solution to?

"Traffic Data Insights for Safe City" by Cēsis, Latvia

2. The solution you are proposing

- What is the solution you are proposing for the challenge above?
- How does it solve the city challenge you target?

We're proposing a video analytics solution running on the city's existing surveillance cameras (or in some instances new cameras are required to be installed). Video analytics is based in our developed Computer Vision algorithms that help classifying different traffic objects (cars, vans, buses, bicycles, pedestrians, etc.), measuring the flow of each object in real-time, and detecting different traffic violations (running the red traffic light, illegal turns, entering the bus lane, etc.). Data is processed on the EDGE and abides by all required data privacy standards (GDPR, ISO).

Our solution allows the city to view the data and analyze it through our platform. In this platform not only the statistical data can be worked with but also automatically cut evidence material on traffic infrignments. The approach we are taking not only allows the city to easily analyze the data but also gather real-time data on traffic in long-term 24/7. If there is a need to provide the data into existing city's data platforms and tools, they can be easily fetched through our API.

3. Innovation and piloting of your pilot solution.

- What are the best solutions available now that solve the challenge you target? (There are some solutions there for sure) How will your solution be better? What is the innovation in it?

- What do the cities need for piloting the proposed solution? How the piloting could work?
- Please provide short information about the capabilities of the research and development proposed team. Your team should have members from TalTech as well for sure. In case you do not have them yet, which skills would you need from TalTech.

The biggest innovation lies in the data sourcing approach. For reliable statistics and decision-making you require reliable data but in most instances the data available is not detailed enough, doesn't have the full picture, and focus on specific data points. Also, often approaches of installing different sensors or heavy infrastructure (expensive and lengthy with building permits) takes place but the sensors often only serve a single purpose and don't deliver as detailed data as say using computer vision. Meanwhile, using existing camera infrastructure can be scaled across the city in no time, doesn't require new infrastructure, and any new event can be trained to be recognized by our algorithms (whatever your eyes see, we can train to be automatically detected). In addition, what we stand out with is the accuracy as we've trained our models to work in complicated weather conditions (heavy rain, snow, etc.) as well as night time to enable reliable 24/7 monitoring and continously deliver acurracy of >97.2%. We've also explored and piloted use cases of camera usage in public transport to register entering and exiting passengers and comparing it to ticket sales to identify how often peope drive without purchasing tickets.

The only thing cities need is to identify cruical intersections for them, and provide access to the video feed of their cameras. In some instances where cameras might have to be installed, only necessity is electricity, and these are easliy movable to other points within a day's time.

We have a strong internal development team but see additional knowledge would be useful in new algorithm development to expand the functionality on optimizing public transport routes and expand on enriching the datasets with additional data the city is gathering for even wider analysis on city's performance in many aspects related to mobility. Interesting research scenarios would also include simulating or forecasting event or flow change occurance in the city.

4. Expected impact of your pilot solution.

- What is the potential impact for city environments, sustainability and citizens?

  For cities this would result in more data-based decision-making which would result in optimized urban infrastructure in long-term. Also, short-term decisions can be made if an acute problem is identified. Sustainability and citizen benefits root in better decision made by cities using reliable data. People get to places faster, with optimized public transport, biking paths, the roads are much safer with automatic enforcement discouraging all traffic participants to brake rules.