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 Platform Using Cameras

Planned pilot project duration – 24 months

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

- Which city challenge/-s proposed by the cities / counties you are targeting? NB! Please choose one from the list of urban challenges chosen for the Smart City Challenge 2025, i.e. Round 5.

  "Urban Freight Loading Zones " by Tallinn, Estonia
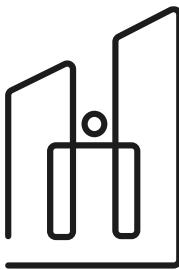
2. The solution you are proposing

- 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 (with some instances where new cameras need 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.), and detecting different traffic-related events. Data is processed on the EDGE and abides by all required data privacy standards (GDPR, ISO).

Our solution allows the city to automatically identify vehicles in the zones of interest, and define when and how they would be dealt with. Our solution can automatically cut evidence material on traffic infringments, in this case stopping in the loading zones, standing there for too long or unauthorized cars parking there. This can be adjusted to city's needs, either sending real-time alerts to police or registering number plate and other relevant information in the platform and then automatically processing this as a fine 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 and connect with the necessary public organizations.

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.

Current approaches, to monitoring loading zone compliance usually rely on enforcement by police or traffic wardens periodic patrols or solutions that need a lot of infrastructure such as inductive loops and purpose-built sensors placed in pavement or curb. Monitoring loading zone compliance with patrols uses resources and cannot give 24/7 coverage. Monitoring loading zone compliance with sensors serves only one purpose, needs building permits, and takes a long time to install. Monitoring loading zone compliance also does not provide the real-time data that urban logistics planning needs, for decisions based on evidence.

The main benefit with our solution is the data sourcing approach. It works by using the city's existing camera network and servres multiple purposes, while being able to detect these events, any other event in view and keep using it for suirveilance. The data sourcing approach combines the city's existing camera network, with computer vision algorithms that are trained for traffic environments. If human eyes can see the event the data sourcing approach can train the computer vision algorithms to recognize the event automatically. What distinguishes our solution is operational reliability in challenging conditions. Our algorithms have been trained and validated for heavy rain, snow, fog, and nighttime scenarios, delivering consistent accuracy above 97.2% around the clock. This weather-resilient performance is essential for Nordic and Baltic cities where enforcement tools must function year-round without degradation.

The only thing cities need is to identify these points of interest, 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.
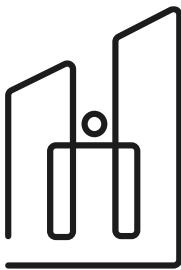
Within this pilot, in collaboration with TalTech researchers, we could develop an urban delivery logistics functionality in addition to the currrent functionality. For example, in historic city centers where maneuvering space and transport capacity are limited, video footage could be analyzed and, based on the data, delivery permissions could be granted to specific operators. Temporary delivery staging areas could be established in locations that do not disturb city residents. When delivery operators arrive at the staging area, they would be assigned a place in the queue and, when their delivery slot becomes available, provided with the optimal and fastest delivery route.

4. Expected impact of your pilot solution.

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

Automated enforcement ensures the new traffic law translates into actual behavioral change—pavements return to pedestrians, loading zones function as designed, and delivery vehicles no longer block traffic lanes or mount curbs. The data generated reveals which locations need additional loading infrastructure, enabling evidence-based curb allocation

in a city where space is scarce. For Tallinn's historic centre, consistent enforcement protects narrow streets never designed for modern delivery volumes.

Reliable loading zone availability reduces emissions from vehicles circling for parking or idling behind double-parked trucks. Efficient zone management is also a prerequisite for sustainable last-mile logistics—cargo bikes and electric delivery vehicles cannot afford time lost to congestion or unavailable stops. Beyond enforcement, continuous traffic flow data supports long-term planning: measuring low-emission zone impact, identifying pedestrianization opportunities, and tracking modal shift over time.

Pedestrians—especially children, elderly, and mobility-impaired residents—gain safer streets when delivery vehicles no longer force them into traffic lanes. Automated enforcement applies rules uniformly around the clock, building public trust through transparency rather than selective patrols. Residents on commercial streets experience reduced noise and obstruction, while businesses benefit from faster, more predictable deliveries when zones work as intended.