FinEst Centre
for Smart Cities

SMART CITY CHALLENGE 2025

City Challenge

Max 3 pages

send to smartcity@taltech.ee by Sept 30, 2025

Challenge Title – Rainwater harvesting in the city

City/county and country – Jelgava, Latvia

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

- **Please describe the challenge of your city / county neighboring a city?**

In recent years, climate change has significantly increased the frequency of extreme rainfall, where precipitation rates exceed both the average daily rate and the sewerage system's capacity. Jelgava is particularly vulnerable: it is a flat city situated between two rivers (6032 hectares in total, of which 293 hectares are open water). As the lowest-lying populated area in Latvia (2.0–4.5 m above sea level), Jelgava faces high groundwater levels, which put additional pressure on its drainage and stormwater systems, especially during spring floods.

All this significantly complicates the removal of rainwater, because the relief does not allow water to naturally leave the area; to remove water into rivers, diverting sewer pipes is used, while the drainage system is used to collect fresh water from the drains and drainpipes. Although the city operates more than 2,500 gullies, a rainwater drainage network of ~143 km, and 12 large collectors, the system is often overwhelmed. It can manage precipitation up to 15–20 mm, but during short and heavy rainstorms of 30–50 mm and more, the system floods, leaving streets and low-lying areas submerged.

- Which category your challenge is primarily in: safe city, happy city, and climate resilient city?

Solving this challenge could be the key to making Jelgava a climate-resilient city. Due to climate change, "tropical type" rains, where large amounts of precipitation fall in a short period of time, are increasingly common in Latvia, so there is a need to adapt to these climate changes using green, innovative and sustainable solutions.

- Why is it important for your city to solve it? How big priority it is for you and why?

For the residents of Jelgava and the municipality, the floods represent problems and losses. At the end of June 2024, the total losses due to damage to infrastructure and property due to heavy rains were around 13 million euros, of which around 7 million were directly to residents' properties. The increase in such cases in recent years shows the need to adapt to this threat and the need to solve it, because in the long term, without changes in the situation, damage will be caused regularly.

- Is this a unique challenge/problem of your city, why or is this by your knowledge a challenge/problem that many cities have – which kind of other cities?

Flat, low-lying cities with aging sewerage infrastructure across Europe face the same challenge. Jelgava can become a model for these cities by piloting scalable, climate-resilient solutions.

2. Innovation.

- How have you solved that issue so far? Why aren't the present solutions good enough? Are there legal obstacles, which ones?

Over decades, local government has invested in improving sewerage infrastructure – reconstructing collectors, enlarging ditches, separating wastewater and rainwater systems. Yet these efforts have limits. Infrastructure expansion is financially demanding, and endlessly increasing pipe capacity is neither technically feasible nor sustainable—especially since the most extreme rainfall events only occur a few times per year.

- What should be the main features, characteristics of the future solution to be potentially best for that challenge or problem?

The future solution must go beyond infrastructure enlargement. The most important functionality that must be present in the solution to this challenge is the ability to collect, store and reuse rainwater, instead of just diverting it. Another challenge will be planning such a solution for the city, because in many places the existing infrastructure leaves no room for big actions, therefore solution should be flexible and modular. Such an approach would combine engineering with green innovation, making Jelgava more resilient while enhancing urban quality of life.

3. Expected impact of your pilot solution.

- What is the expected impact to your city environment you expect to see if the challenge gets solved?

The city will be prepared for floods, the absence of damage to the infrastructure will make the urban environment more attractive and climate-resistant. The integration of green solutions will create more biodiversity, improve air quality, and lower the heat island effect—making Jelgava both safer and greener.

- What is the expected impact to your citizens you expect to see if the challenge gets solved?

Residents will experience greater security and comfort. Their homes, mobility, and essential services (electricity, heating, water supply) will no longer be disrupted by floods. Green spaces and visible water management systems will also enhance well-being and city attractiveness.

- What is the expected impact to your city governance you expect to see if the challenge gets solved?

Less spending on post-disaster recovery means more resources for long-term development projects (education, mobility, digitalization). Stronger resilience planning will also increase trust in local government, showing that it protects both property and quality of life.

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4. Piloting

- Why would you be interested to become a piloting partner of a proposed solution to the challenge you are describing here? Describe shortly your capability to participate.

Why Jelgava is an ideal piloting partner:

- The city already participates in international climate projects (e.g., IMPETUS, focused on early warning systems in case of floods).
- Local government has strong capacity to experiment, a well-developed infrastructure network and previous experience with EU and cross-border initiatives.
- Jelgava offers an ideal testbed: a manageable size, clear vulnerability to flooding, and an administration motivated to adopt innovative solutions.

What Jelgava offers the partnership:

- Readiness to host pilot implementations in both residential and central areas.
- Willingness to share knowledge with other European cities facing similar challenges.
- Commitment to building long-term resilience, turning pilot projects into permanent, scalable solutions.

By piloting here, solution providers will gain a realistic testing environment with direct societal impact and visibility across Latvia and beyond.