

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 – Detailed solutions for nature-based rainwater systems

City/county and country – Hundipea area in Tallinn, Estonia

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

A major future challenge for our city and Hundipea is sustainable stormwater management. Traditional “grey” infrastructure cannot keep pace with growing rainfall variability, urbanization, and environmental pressures. Nature-based solutions (NBS) like rain gardens and sustainable urban drainage systems (SUDS) offer promise but may sometimes underperform due to design flaws, technical uncertainties, and poor maintenance—issues that can also harm public perception.

Many of these problems could be solved by selecting the right, locally adapted plant species. Properly chosen plants filter pollutants, improve infiltration, stabilize soil, and support biodiversity in ways engineered solutions alone cannot. **Yet not all plants perform equally, and knowledge about which species are best suited for specific sites remains limited.**

This challenge is primarily in the resilient city category.

For Hundipea, this challenge is particularly significant due to the strong interconnection with neighboring urban areas. Rainwater from surrounding districts and city streets flows across our territory before reaching the sea. When left untreated, this runoff directly impacts the shared ecosystems and public spaces of Hundipea. Without well-designed and properly maintained solutions, both Hundipea and Tallinn face the risk of deteriorating water quality, declining biodiversity, and heightened vulnerability to flooding. Addressing this issue is therefore essential for ensuring resilient infrastructure, protecting public health, and enhancing the overall quality of urban life.

Solving this challenge is a high priority, as stormwater systems are long-term infrastructure investments that directly influence citizens’ quality of life and trust in urban development. Without effective solutions, the costs of remediation and system restoration increase, and public skepticism toward innovative environmental measures grows. **Choosing the right plant species, ensuring proper maintenance, and adopting long-term monitoring are therefore critical to building durable, cost-effective, and publicly accepted stormwater systems.**



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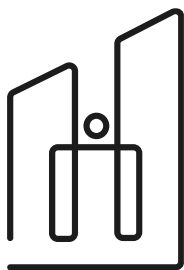


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This is not a unique challenge for our area alone. Across Europe and globally, many cities—particularly those in temperate and boreal regions—face similar difficulties in implementing NBS. Issues such as plant mortality, system aging, uncertain maintenance responsibilities, and aesthetic acceptance are widespread in urban areas from Northern Europe to North America. Thus, our city shares this challenge with many others, and by developing effective, resilient, and scalable solutions, we can contribute not only to local sustainability but also provide a model for other municipalities worldwide.

2. Innovation.

At present, this challenge remains unresolved, but it will need to be addressed in the near future. The current approach relies on years of experimentation to identify suitable plant species, which results in high costs for maintaining and managing these systems. A future solution should therefore focus on identifying the most appropriate plant species for the specific area—species capable of filtering pollutants, enhancing infiltration, stabilizing soil, and supporting biodiversity.

3. Expected impact of your pilot solution.

The expected impact of the solution would provide both Tallinn and Hundipea better rainwater management systems and healthy low maintenance greenery in the city.

4. Piloting

Yes, Hundipea is interested in serving as a pilot partner. The area is already equipped with rainwater pipes that discharge local runoff into the sea, and preparations are underway for the development of a new urban district comprising both residential and commercial areas. We are committed to integrating sustainable rainwater management systems into this development.

