

SMART CITY CHALLENGE 2025

City Challenge

Max 3 pages

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

Challenge Title – Smart Marine Pollution Detection and Response

City/county and country – Istanbul Metropolitan Municipality (IMM) – ISBAK, Turkey

Main contact from your city/county – Emin Abbaszade, ISTANBUL IT AND SMART CITY TECHNOLOGIES INC. (ISBAK), R&D and Innovation Process Expert, eabbaszade@isbak.istanbul, +90 534 507 62 38

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

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

Istanbul is facing growing marine pollution in the Bosphorus, Golden Horn, and nearby creeks due to solid waste from land, ships, and floodwaters. This pollution threatens marine life, coastal areas, and public health. Since the Bosphorus is a vital waterway linking Asia and Europe, protecting it is a high priority for the city.

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

climate resilient city

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

Addressing this challenge is a top priority for Istanbul Metropolitan Municipality and ISBAK, as pollution control directly protects the marine ecosystem, reduces health risks, strengthens tourism, and preserves Istanbul's international reputation. Without an effective solution, pollution levels will continue to rise, damaging both environment and citizen life quality.

- 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?

While the Bosphorus is unique as an international corridor, marine pollution is a global problem faced by many coastal and port cities with heavy maritime traffic, such as Rotterdam, Singapore, Hong Kong, Helsinki, and Tallinn. Thus, Istanbul's experience and solutions can serve as a model for other cities worldwide.



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2. Innovation.

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

Until now, marine pollution has mostly been managed through manual clean-up operations and limited surveillance. These methods are expensive, slow, and cannot ensure continuous monitoring. In Istanbul, the responsibility is divided: İSTAÇ (Istanbul Environmental Management Corporation) under the municipality cleans the sea surface, the Directorate General of Coastal Safety manages maritime traffic, and the Ministry of Environment, Urbanization and Climate Change enforces environmental rules. Because the duties are split between these institutions, coordination is slow and enforcement against polluters is often weak.

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

The future solution should provide continuous 24/7 monitoring under all weather conditions and integrate advanced technologies such as radar, thermal and infrared sensors, standard video cameras, drones, and ship tracking via AIS signals. These tools should be connected through a centralized decision-support platform that applies AI and machine learning for early warning, prediction of pollution spread, and trend analysis. The system should deliver real-time alerts, enable data sharing among relevant authorities, and ensure seamless coordination between municipal, maritime, and environmental institutions. By combining detection with rapid intervention, the solution will shift marine pollution management from reactive clean-up to proactive prevention.

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?**

Cleaner seas and coasts in the Bosphorus and Golden Horn, with less solid waste, healthier marine life, and stronger protection of the water ecosystem.

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

Better public health through reduced exposure to polluted waters, improved quality of life, and enhanced recreational and tourism opportunities along the city's coasts and waterways.

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

Stronger monitoring and enforcement capacity, improved inter-agency coordination, and data-driven decision-making that allows authorities to act faster and more effectively against polluters.





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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.**

Istanbul Metropolitan Municipality and ISBAK are interested in becoming a piloting partner because the city has both the need and the capacity to test such solutions. Istanbul has experience with smart city projects, technical teams, and existing services like İSTAÇ for sea cleaning. This makes the city well prepared to host pilots, test new technologies in real conditions, and quickly use the results in daily operations.

Istanbul Metropolitan Municipality / ISBAK. ISBAK is an affiliated company established by the municipality to provide smart city solutions and is fully owned by Istanbul Metropolitan Municipality.

CHECKLIST AND FAQ

Are you a city, municipality or a campus / private real estate developer?

Yes – you are warmly welcome to propose 1-3 challenges, one challenge per one template

No – do not send us any challenges but wait until we have gathered urban challenges and you are welcome to propose solution ideas by November 30

Are you describing challenge or problem? – Yes, then great.

Does a city need to propose a solution idea as well? – No, the researchers and companies will propose their solution ideas to the challenges proposal by the cities.

Can only Estonian cities propose challenges? Can only EU cities propose challenges? – No, cities* from whatever country are warmly welcome.

*A **City** is a local administrative unit where the majority of the population lives in an urban centre of at least 50 000 inhabitants and cities from countries with less than 5 cities of more than 100 000 inhabitants if they have more than 10 000 inhabitants. Those countries are: Croatia (HR), Cyprus (CY), Estonia (EE), Ireland (IE), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Slovenia (SI) and Slovakia (SK).

Can our city participate without proposing a challenge? – Yes, that is also possible but then you need to vote for challenges proposed by other cities. This can be done between Oct 2-30.

How will the challenges be evaluated? – We will not evaluate the proposed challenges but other cities/municipalities/campuses/private real estate developers can vote for the proposed challenges. In Round 5 researchers will start to propose solution ideas only to the challenges that have minimum one Estonian city/county and one city/county from another country.





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