

## Challenge for the Cities Cup

### CITY ECOPULSE: DIGITAL SYSTEM FOR MONITORING AND MAINTAINING GREEN URBAN SPACES

#### Focus Area

Solutions in the field of ecology and sustainable urban development.

Development of digital tools that support systematic management of urban green areas, improve the quality of public spaces, and engage residents in environmental stewardship.

#### Objective

To create a viable digital solution that enables effective management of green areas, enhancing environmental sustainability and the quality of the urban environment in northern and industrial cities of Russia.

#### Context and Relevance

In many northern and industrial cities of Russia, the preservation and maintenance of green spaces remains an urgent challenge.

Harsh climate conditions, a short vegetation period, and limited municipal resources complicate the maintenance of urban ecosystems.

One of the typical examples is the town of **Kovdor** (Murmansk Region), a mono-industrial center built around the Kovdor Mining and Processing Plant (Kovdorskiy MPP). The area features a short summer season, long cold winters, and high maintenance requirements for landscaping.

Other common issues include:

- Lack of a unified database on the condition of green areas and public spaces
- Insufficient tools for monitoring, planning, and scheduling maintenance activities

Participants may choose any comparable city where SUEK, SGK, or EuroChem operate, such as Barnaul, Biysk, Rubtsovsk, Kotelnikovo, Leninck-Kuznetsky, Polysayev, Prokopyevsk, Myski, Borodino, Nazarovo, Sharypovo, Kovdor, Kingisepp, Berezniki, Abakan, Chernogorsk, Reftinsky, Chegdomyn.

All of these cities share similar challenges — climatic vulnerability, industrial pressure, and the need for systemic ecological management.

#### Problem Statement

Cities with harsh climates and industrial specialization lack a unified system for monitoring the state of green areas. Municipal services struggle to track vegetation health, schedule watering, pruning, cleaning, and repairs in a timely manner.

As a result:

- Public spaces degrade
- Maintenance costs increase
- Quality of life declines
- Natural potential of the city is lost

### Assignment for Participants

Develop a **digital platform or mobile application** that will enable:

- Monitoring the condition of green and landscaped urban areas
- Recording maintenance needs: watering, pruning, cleaning, repairs
- Displaying information on an interactive map with analytics
- Generating reports and forecasting urban ecosystem conditions

The solution must simplify the work of municipal services, improve maintenance quality, and create engagement mechanisms for residents.

### Possible Development Directions

- **Interactive map** displaying the condition of green areas and public spaces
- **Mobile app for maintenance specialists** with reporting and issue-tracking functions
- **Citizen-facing platform** for submitting requests on damaged or neglected areas
- **Analytical module** for forecasting vegetation health and planning maintenance budgets

### Input Data (Example: Kovdor)

- Population: 16,439 (as of 01.01.2025)
- Major enterprise: Kovdor Mining and Processing Plant (Kovdorskiy GOK)
- Harsh climate, short vegetation season
- Total area of green and landscaped urban spaces
- Pilot project budget: up to 3 million rubles
- Estimated implementation cost: ~1.5 million rubles

### Constraints

- Severe climate and short seasonal maintenance window
- Required operation under limited internet connectivity
- Compliance with data protection and environmental information standards
- Limited availability of monitoring sensors and equipment

### Expected Deliverables

1. Concept and architecture of the digital solution
2. Prototype of the platform or mobile application interface
3. Economic justification and implementation plan

#### 4. Forecast of ecological and social impact:

- Improved condition of green areas
- Increased public engagement
- Reduced maintenance costs

#### **Additional Materials**

- Appendix 1. Input data template: map of public spaces and green areas
- Appendix 2. Data on the total area of green spaces

## Appendix 2. Data on the total area of green spaces

### List of Public Green Areas in the City of Kovdor

Name and Location of Public Green Space	Area, ha
Lakeside Park	≈18.73
Park bounded by Lenina St., Sukhacheva St. and Gornyakov St.	≈5.8
Ravine Park ( <i>или просто "The Ravine" если это природная территория</i> )	≈5.68
Sokolniki Park	≈0.46
Central City Park (around the Palace of Culture)	≈2.07
Park bounded by Pobedy St. and Stroiteley St. (near 1 Koshitsa St.)	≈1.72
Green Square near 28 Koshitsa St. (by the "Uyut" Hotel)	≈2.02
Green Square bounded by Stroiteley St., Sukhacheva St. and the access road	≈0.5
Green Square bounded by Stroiteley St. and Sukhacheva St. (near Checkpoint No. 2 of the Mining and Processing Plant)	≈1.58
Green Square behind 8 Slyudyana St.	≈4.67
Green Square behind 6 Komsomolskaya St.	≈1.07
Green Square by the Church of the Dormition of the Holy Mother of God	≈0.64
Green Square behind 16 Koshitsa St.	≈1.01
Green Square within the block bounded by Konovalova St., Pobedy St., Kirova St. and Lenin Square	≈0.41
Green Square within the block bounded by Sukhacheva St., Kirova St., Konovalova St. and Lenina St.	≈0.71
<b>Total:</b>	≈47.04 ha