SPACE 4Cities

Innovation Catalogue

20 Solutions Funded by SPACE4Cities

This project has received funding from the European Union for the Space Programme Agency (EUSPA) via the Horizon Europe research and innovation programme under grant agreement No. 101131955.

SPACE 4Cities

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space4cities.eu

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space4cities.eu

Foreword

For more than a year, the tremendous engagement witnessed by SPACE4Cities has proved the necessity to create bonds between the space industry and urban players, especially local authorities like municipalities, regions, public agencies, etc.

On the one hand, local authorities face increasingly interconnected challenges and regulations affecting public spaces: light, air and water pollution, noise, climate change impacts, biodiversity loss, disposable land use, climate-neutrality, congestion, security, pandemics, etc.

On the other hand, space-based data and services (also known as the space downstream industry) become ever more adapted to urban challenges thanks to advancements in quality, precision, awareness and accessibility of satellite data. Based on these trends, Earth observation (EO) and Global Navigation Satellite System (GNSS, notably Galileo) applications are expected to grow to a 55-billion€ market in the EU alone in 2033[1]. However, this market will be largely driven by the public sector which, in the urban context, involves local authorities. Hence the need to help:

- local **authorities** master procurement processes related to space technologies so that they can buy fit-for-purpose, cost-efficient and sustainable solutions;
- **suppliers** understand and anticipate urban challenges as well as navigate procurement rules, so that they maximise chances of contracting with the public sector.

In terms of technology, SPACE4Cities is the first innovation procurement stimulating both EO and GNSS technologies, thus fostering their combination in meeting both European cities' and the space sector's needs. With regard to challenges addressed, it is the first European pre-commercial procurement explicitly covering themes like climate adaptation and urban planning.

The Innovation Catalogue

More than just providing a 2.87M€ funding opportunity for R&D, our project is actually a two-year enabling programme and a collective endeavour. Indeed, SPACE4Cities' partners will provide support services to the 20 selected suppliers, while ensuring that synergies are created between solutions. This activity is led by Aerospace Valley.

One of these key services is the **Innovation Catalogue**, which you are about to read. Designed primarily for European cities, R&I projects and the general public, it will increase the suppliers' visibility and raise much-needed awareness on space applications, services and data.

Given the broad audience considered, we chose to focus on end users, types of cities, innovativeness, use cases addressed and which space data and services are integrated by solutions. Its appealing colours and extensive use of images and logos says it all: space applications are cooler and more down-to-Earth than you think!

Enjoy the reading and join the movement to use space data for public spaces!

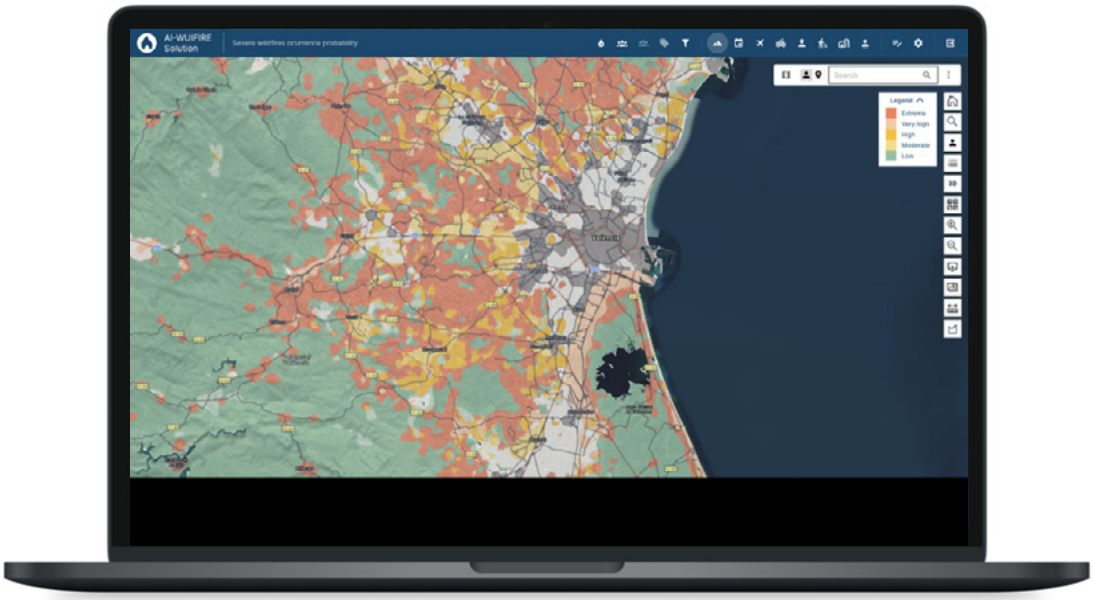
[1]Source: EUSPA EO and GNSS Market Report, Issue 2, copyright © European Union Agency for the Space Programme, 2024.

Index of solutions

AI-WUIFIRE

MAIN CONTRACTOR:
VEXIZA
WWW.VEXIZA.COM

AI-WUIFIRE IS a GIS solution that helps cities prevent and manage wildfire risk in wildland-urban interfaces (WUI). It combines remote sensing, advanced modelling, and Copernicus satellite data to produce spatially detailed fire severity predictions, updated in near real time. The platform integrates modules for prevention, response, and post-emergency analysis, allowing municipalities to visualise high-risk areas, coordinate actions, and assess impacts through an intuitive dashboard. The platform automates complex data processing tasks, eliminating technical barriers for end users. Outputs are delivered in lightweight, GIS-ready formats, enabling fast, informed decision-making without the need for advanced expertise in remote sensing or AI.



CHALLENGE ADDRESSED

Climate resilience

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Emergency management and humanitarian aid
- Infrastructure

Innovativeness of the Solution

AI modelling: ML algorithms trained on Copernicus datasets to model the complex interactions between vegetation, topography and fire behavior.

Data ingestion: Automatically ingests, processes, and updates wildfire severity predictions in near real time

User-friendly visualization: Combines all data sources into a unified web-based GIS platform that translates complex spatial and satellite-derived data into intuitive dashboards and actionable maps.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Facilitates preventive action to reduce wildfire risk in wildland-urban interfaces, protecting therefore human lives, housing, and public infrastructure. Also helps lower emergency response costs and mitigates secondary health impacts, such as avoiding potential smoke episodes affecting urban populations.

END-USER / CUSTOMER PROFILE

- Municipal emergency services
- Local government departments for urban and land-use planning

TYPE OF CITIES TARGETED

Cities with populated urban-forest interfaces, unmanaged vegetation and a fire-prone climate.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

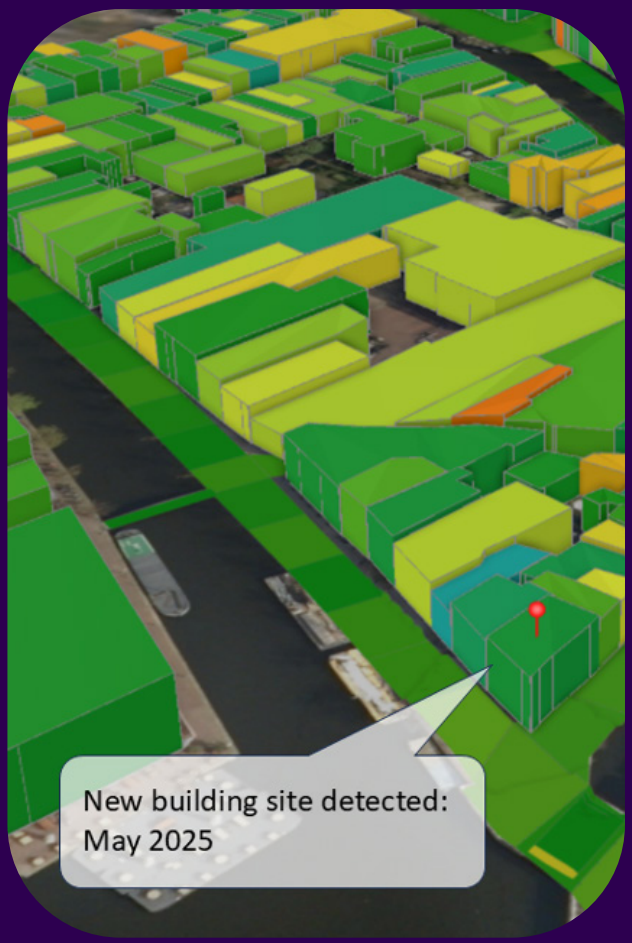
Copernicus Emergency Management

CEM

MAIN CONTRACTOR:
SENSAR B.V.
WWW.SENSAR.NL

THE CITY ELEVATION MONITOR (CEM) is a powerful solution designed to support municipalities in the proactive, data-driven management of urban infrastructure. As cities face increasing challenges related to aging assets, climate resilience, and urban growth, CEM offers a powerful toolset to help local governments make smarter, safer, and cost-effective decisions. Built with the needs of municipal professionals in mind.

The three components of CEM - Scan-Detect-Map- harness the power of satellite-based elevation monitoring and advanced analytics to deliver timely insights into ground movement, structural shifts, and environmental changes. These insights enable city officials, engineers, and planners to prioritize maintenance, mitigate risks, and allocate resources more efficiently—ultimately enhancing public safety and service delivery. Whether monitoring critical infrastructure, planning new developments, or responding to environmental risks, CEM empowers municipalities to adopt a risk-based, future-ready approach to urban management. Whether you're planning infrastructure upgrades, monitoring vulnerable areas, or optimizing maintenance schedules, CEM gives you the data you need to act with confidence.



CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Emergency management and humanitarian aid
- Infrastructure
- Rail
- Road and automotive
- Urban development and cultural heritage

Innovativeness of the Solution

City Elevation Monitor (CEM) is a web-based portal for municipal professionals, providing interoperable and real-time data access to monitor urban assets. It is a 'Level-3' InSAR product using data fusion to provide precise, millimetre-level deformation data per object, so its change detection service is weather-independent. CEM also includes HeightMapper for height models using SAR2Height algorithms. It enables data-driven decision-making to manage elevation risks and protect assets.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

By monitoring surface deformations and changes in elevation, the CEM helps identify potential hazards early thus increasing safety, enables informed decisions about infrastructure projects. CEM's is cost-effective, potentially saving public funds by preventing repairs and optimizing maintenance. By detecting inundation, the CEM supports efforts to protect natural resources and manage urban ecosystems sustainably.

END-USER / CUSTOMER PROFILE

- Asset managers
- Technical managers
- Policy makers
- Engineers operating within or on behalf of municipalities, risk management and maintenance planning teams

TYPE OF CITIES TARGETED

CEM is designed to serve municipalities of all sizes by offering tiered service levels —Light, Basic, and Advanced.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus Land Monitoring Service

CHERISH

MAIN CONTRACTOR:
EONSIGHT
WWW.EONSIGHT.EU

CHERISH (Cultural HERitage InSAR-based Surveillance for Hazards) is a satellite-based monitoring solution designed to help European cities detect and anticipate ground deformation risks affecting Cultural Heritage assets. Combining Copernicus Sentinel-1 data, the European Ground Motion Service (EGMS), and advanced Persistent Scatterer Interferometry (PSI) techniques, CHERISH delivers asset-level risk indicators through a user-friendly dashboard or API. By integrating explainable AI and local geospatial datasets, the service enables municipalities to move from reactive to preventive maintenance strategies. CHERISH builds on eOnsight's prior expertise in bridge monitoring and offers a scalable, non-intrusive tool to safeguard historic monuments, districts, and landmarks—preserving not only cultural identity but also supporting city planning and tourism resilience.

CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Urban development and cultural heritage

Innovativeness of the Solution

CHERISH builds on our prior experience with bridge monitoring to deliver a non-intrusive, Persistent Scatterer Interferometry (PSI)-based EO solution for Cultural Heritage assets. It combines Copernicus data, interpretable ML, and open-source Synthetic Aperture Radar (SAR) data processing into a scalable, interoperable service. Dual delivery mode (dashboard/API) enables seamless integration into municipal systems, from digital twins to GIS, supporting predictive, asset-level risk insights.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

CHERISH promotes preventive preservation of cultural heritage, reducing maintenance costs and emergency interventions. It supports tourism resilience, enhances urban planning with Earth Observation (EO) data, and limits the need for intrusive ground surveys, lowering environmental footprint.

END-USER / CUSTOMER PROFILE

- City infrastructure, heritage, and urban planning departments
- Cultural protection agencies

TYPE OF CITIES TARGETED

European cities with historic urban cores and Cultural Heritage sites exposed to ground motion risks.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

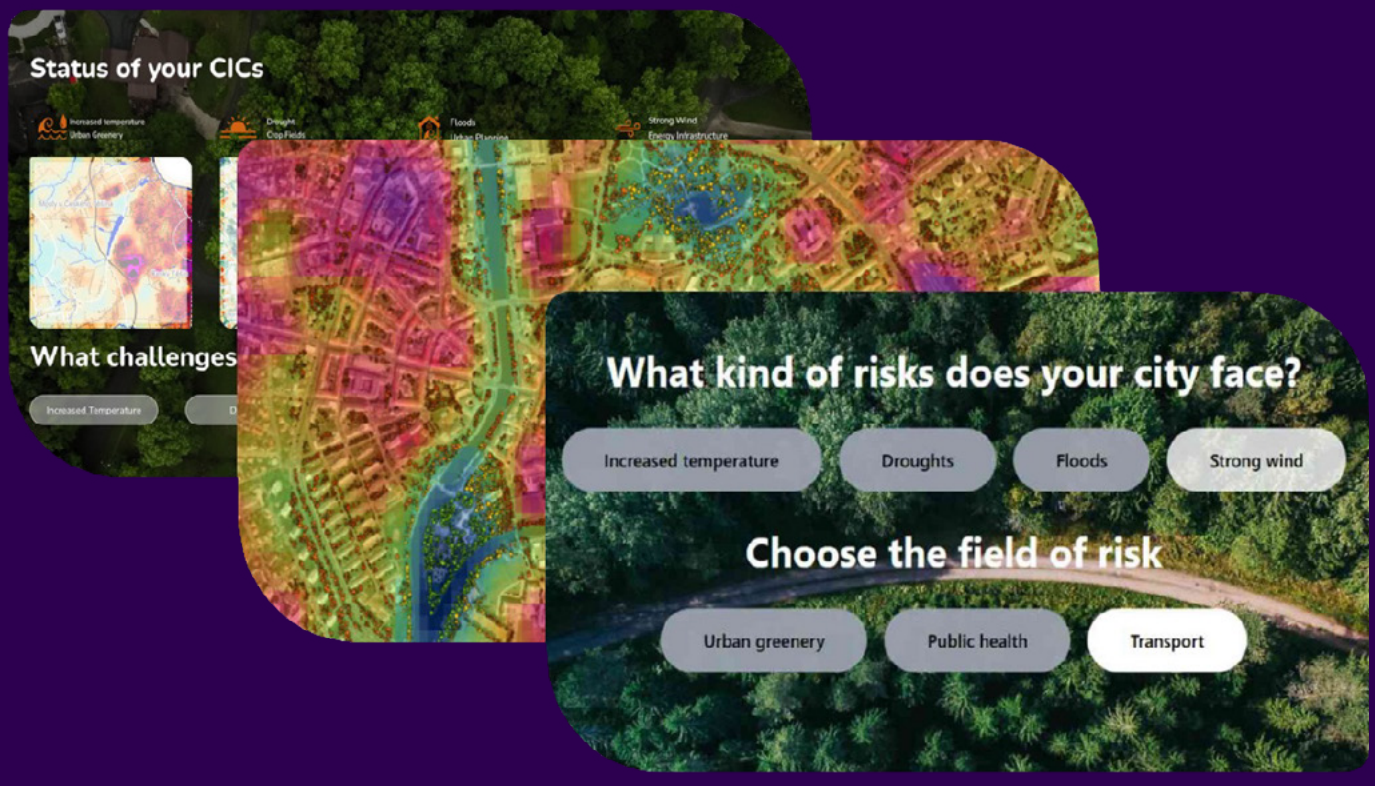
Copernicus Land Monitoring Service

CICADA

MAIN CONTRACTOR:
ASITIS S.R.O.
WWW.ASITISREADY.COM

OTHER CONSORTIUM MEMBERS:
- **WORLD FROM SPACE S.R.O.**
  WWW.WORLDFROM.SPACE
- **ÚSTAV VÝZKUMU GLOBÁLNÍ ZMĚNY AV ČR, V. V. I.**
  WWW.CZECHGLOBE.CZ

CICADA, through its CTAPP (Climate Transition App), equips European cities with an interactive platform that transforms climate strategies into tangible, local actions. CTAPP combines Earth observation (EO) data from Copernicus and Galileo, local infrastructure records, and citizen-sourced input to identify urban vulnerabilities and prioritize climate adaptation measures. Its innovative use of Climate Impact Chains supports planning and predictive modeling for heatwaves, floods, droughts, and other hazards, offering tailored dashboards and a mobile app for civic participation. CTAPP's impact spans short-term action and long-term governance improvement.



CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

CTAPP uniquely combines Copernicus EO data, local records, and citizen inputs into Climate Impact Chains, that evaluate climate change-driven risks in a broad context through actual weather, real vegetation condition, or demography and social distribution of citizens. As such, it is bridging science, planning, and engagement. Its real-time dashboards, geospatial analytics, and app-based civic reports provide practical tools to transition cities from crisis response to proactive resilience.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Mapping drought- and heat-related vulnerability of trees helps to effective resources allocation and coordination, allows for faster climate action, sustainable planning. Reduces risk exposure, improves health state of green infrastructure, and strengthens data-driven municipal governance. Involves public in climate and urban decision making. Empowers cities to plan for impacts of investment projects enabling monitoring of indicators towards city goals.

END-USER / CUSTOMER PROFILE

- Municipal climate officers
- Urban planners
- City developers
- Decision making bodies
- Advisors
- Smart city, data and GIS officers

TYPE OF CITIES TARGETED

Mid-sized cities and bigger (10,000 + cities)

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO

copernicus

Climate Change Service
climate.copernicus.eu

sentinel-2

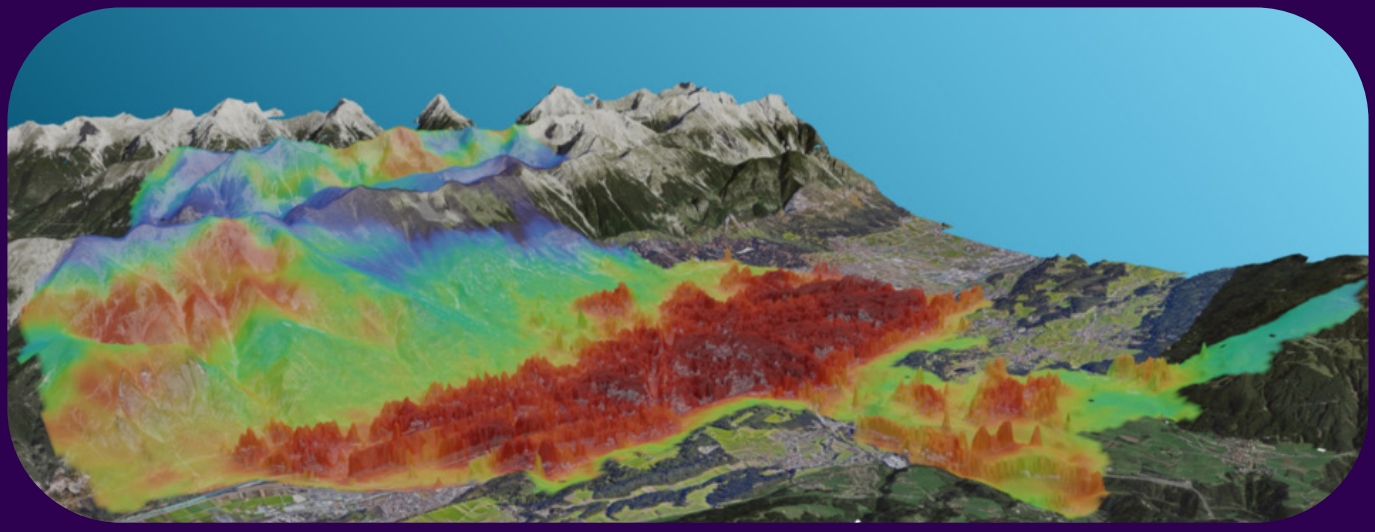
sentinel-1

CIRUS

MAIN CONTRACTOR:
GEOVILLE INFORMATION SYSTEMS AND DATA PROCESSING GMBH
WWW.GEOVILLE.COM

OTHER CONSORTIUM MEMBERS:
- **AVALON PLANNING LIMITED**
  WWW.AVALONPLANNING.CO.UK
- **TRINOMICS B.V.**
  WWW.TRINOMICS.EU

CIRUS project addresses the challenge of urban transformation and climate resilience by developing an advanced climate intelligence system that integrates high-resolution land surface temperature (LST) modelling, digital twins, and multi-source environmental and socio-economic data. It enables monitoring, predicting, and assessing urban heat risks while optimizing planning interventions — such as 15-minute city strategies that incorporate nature-based solutions, infrastructure retrofitting, and active mobility networks — for urban planners, policymakers, and infrastructure managers. Combining Copernicus satellite data, satellite based LST measurements, in-situ measurements, and predictive climate models, CIRUS provides high-resolution heat assessments to identify vulnerable areas and evaluate potential interventions. Its digital twin technology further allows scenario-based planning to simulate the effects of urban greening, land-use modifications, and infrastructure adaptations before implementation.



CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

Sustainable mobility

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Urban development and cultural heritage

Innovativeness of the Solution

CIRUS innovativeness lies in integrating high-resolution EO data, AI, digital twins, and real-time analytics to map urban land surface temperatures at a 10 m resolution. Moreover, it simultaneously addresses urban heat risks and optimizes mobility and urban planning for climate adaptation through dynamic scenario testing on a single platform. Designed for widespread adoption and scalability, the solution will be available as both a standalone SaaS application and an integrable API microservice.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

CIRUS contributes to improving mitigation measures targeting urban heat islands (e.g. low-emission mobility, blue-green infrastructure); reducing carbon emissions; improving public health; creating greener, higher-quality public spaces that enhance residents' well-being; strengthening local economies; and optimizing energy use, lowering costs.

END-USER / CUSTOMER PROFILE

- Urban planners
- Infrastructure managers
- Policymakers
- Investors
- Researchers
- Citizens

TYPE OF CITIES TARGETED

All cities, regardless of size or location, are targeted.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus

Climate Change Service
climate.copernicus.eu

Land Monitoring Service

CityMotion

MAIN CONTRACTOR:
DETEKTIA EARTH SURFACE MONITORING S.L.
WWW.DETEKTIA.COM

CITYMOTION by Detektia is a next-generation solution for intelligent, proactive urban infrastructure management. Cities are constantly evolving systems, yet authorities still lack scalable tools to monitor how ground and infrastructure behave over time. CityMotion leverages satellite InSAR technology to deliver millimetric deformation monitoring at city scale—without physical sensors. This data is made available through a robust, API-first platform that integrates seamlessly with digital twins, GIS, BIM, and external datasets. On top of this, AI agents interact with the API to detect anomalies, predict risks, and provide insights through a natural-language interface. These agents can autonomously analyze trends, correlate variables (e.g. rainfall, construction), and support real-time decision-making. With two innovation layers—an operational InSAR API and an emerging AI integration framework—CityMotion shifts cities from reactive to predictive management. It enables timely interventions, reduces risk, improves transparency, and empowers more resilient, sustainable urban planning.

CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Infrastructure
- Rail
- Road and automotive
- Urban development and cultural heritage

Innovativeness of the Solution

API-first architecture enables seamless integration of satellite InSAR data with urban systems (Digital Twins, GIS) and interaction with AI agents using advanced techniques like Function Calling. This unique combination transforms urban deformation monitoring into a proactive, predictive process, enhancing safety, efficiency, and resilience in city management.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

The solution helps EU cities and regions by improving infrastructure monitoring, enabling early risk detection, reducing costs, and supporting climate resilience. It enhances public safety, health, coordination, and citizen trust, while aligning with the 'do no significant harm' principle for sustainable impact.

END-USER / CUSTOMER PROFILE

- Urban planners
- Engineers
- Asset managers
- Risk officers
- GIS teams in cities and regions

TYPE OF CITIES TARGETED

All EU cities, from small towns to large metropolitan areas.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

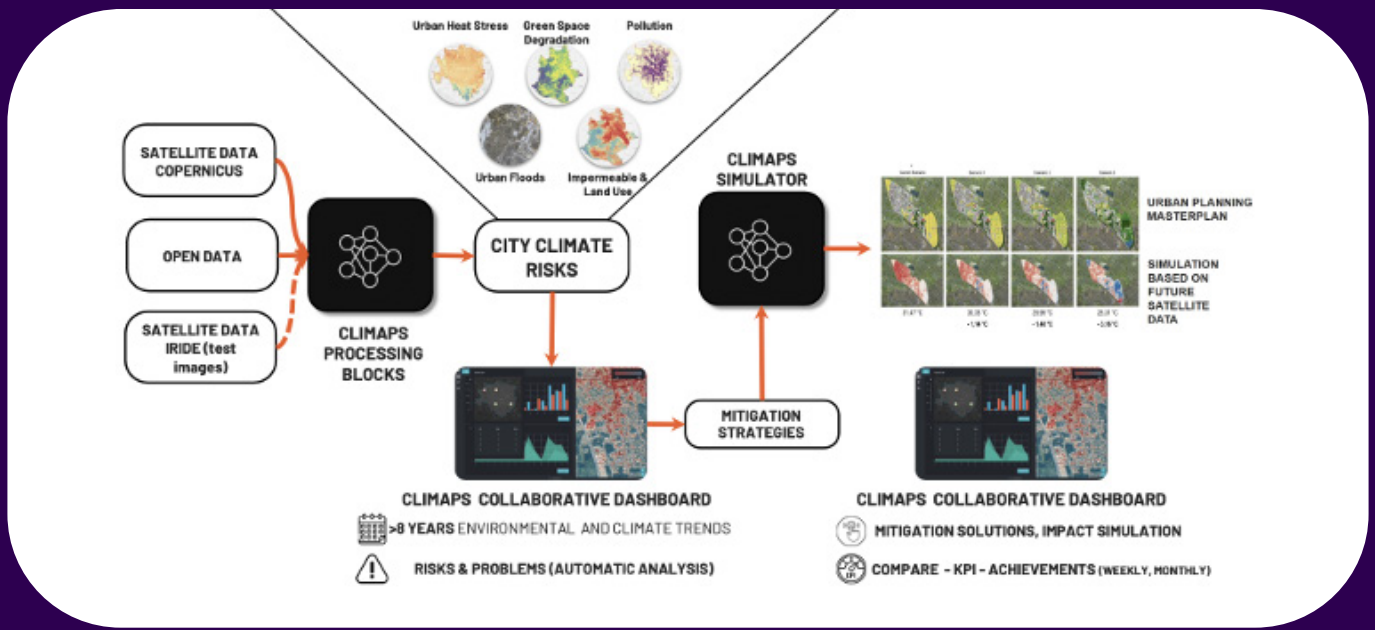
Copernicus Land Monitoring Service

CLIMAPS

MAIN CONTRACTOR:
LATITUDO 40
WWW.LATITUDO40.COM

OTHER CONSORTIUM MEMBERS:
TEAMDEV S.R.L.
WWW.TEAMDEVECOSYSTEM.IT/EN/

CLIMAPS is an innovative urban climate intelligence platform developed by the consortium led by Latitudo 40, with partners TeamDev and Planetek Italia. Leveraging Copernicus and IRIDE satellite data, combined with advanced AI and Generative AI simulations, CLIMAPS provides EU cities with real-time, actionable insights on climate risks such as urban heat islands, flooding, and biodiversity loss. The cloud-native, fully automated pipeline transforms raw satellite data into dynamic risk maps and scenario-based planning tools. With interoperable architecture based on open standards, CLIMAPS integrates seamlessly with existing city systems, enabling planners, environmental officers, and stakeholders to co-design adaptive, sustainable urban strategies. The platform enhances resilience, supports regulatory compliance, and fosters healthier, greener, and more sustainable cities across Europe.



CHALLENGE ADDRESSED

Climate resilience

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Urban development and cultural heritage

Innovativeness of the Solution

CLIMAPS uniquely integrates multi-source satellite data (Copernicus, IRIDE) with AI-driven models and Generative AI simulations, enabling dynamic, predictive urban climate risk management. Its fully automated cloud-native pipeline ensures rapid, scalable insights. The platform's interoperable architecture (NGSI-LD, FIWARE) supports seamless city system integration, real-time decision-making, and scenario-based urban planning, going beyond current static and manual solutions.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

CLIMAPS enables cities to anticipate and mitigate climate risks through AI-driven satellite data, enhancing urban heat resilience, flood management, and biodiversity. It reduces costs and decision time, fosters green infrastructure, improves public health, and supports regulatory compliance, promoting sustainable, adaptive urban development.

END-USER / CUSTOMER PROFILE

- Urban planners
- Environmental engineers
- GIS specialists
- Sustainability officers
- City managers

TYPE OF CITIES TARGETED

Medium to large EU cities facing climate adaptation challenges with diverse urban environments.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO

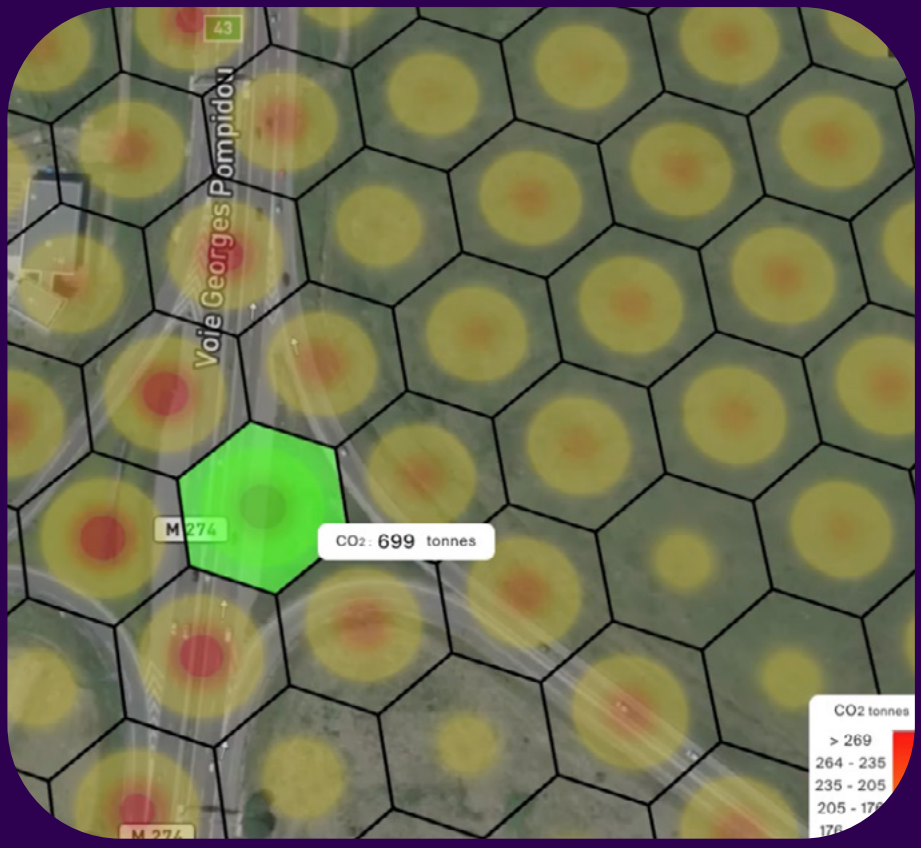
Copernicus

Climate Change Service
climate.copernicus.eu

DYNAMO-SM

MAIN CONTRACTOR:
EVERIMPACT S.A.S
WWW.EVERIMPACT.COM

EVERIMPACT.AI combines satellite-based CO_2 monitoring, ground sensors, and video analytics to deliver real-time, high-resolution emissions data to cities. This enables dynamic enforcement and planning for Low/Zero Emission Zones, identification of emissions hotspots linked to logistics and public space use, and data-driven promotion of active mobility and public transport. By attributing emissions to specific activities and modes, cities can design targeted incentives and infrastructure. The solution also supports climate adaptation by mapping emissions and environmental risks, guiding green investments and urban resilience efforts.



CHALLENGE ADDRESSED

Sustainable mobility

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Road and automotive
- Urban development and cultural heritage

Innovativeness of the Solution

Everimpact uniquely combines satellite CO_2 data, ground sensors, and video analytics to deliver real-time, hyperlocal emissions attribution. Unlike traditional estimates, it provides verifiable, continuous measurements linked to specific mobility modes or activities. Its integration into urban platforms enables cities to dynamically adjust policies, enforce LEZs, and unlock green finance through measurable impact.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Helps cities cut CO_2 emissions, improve air quality, and adapt to climate change. Enables data-driven mobility and infrastructure policies, supports public health, and unlocks green financing by proving impact with real-time, verifiable emissions data.

END-USER / CUSTOMER PROFILE

- City climate, mobility, environment departments
- Public transport agencies
- Urban planners

TYPE OF CITIES TARGETED

Mid-to-large EU cities with climate goals, LEZ/ZEZ zones, or mobility decarbonization plans.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

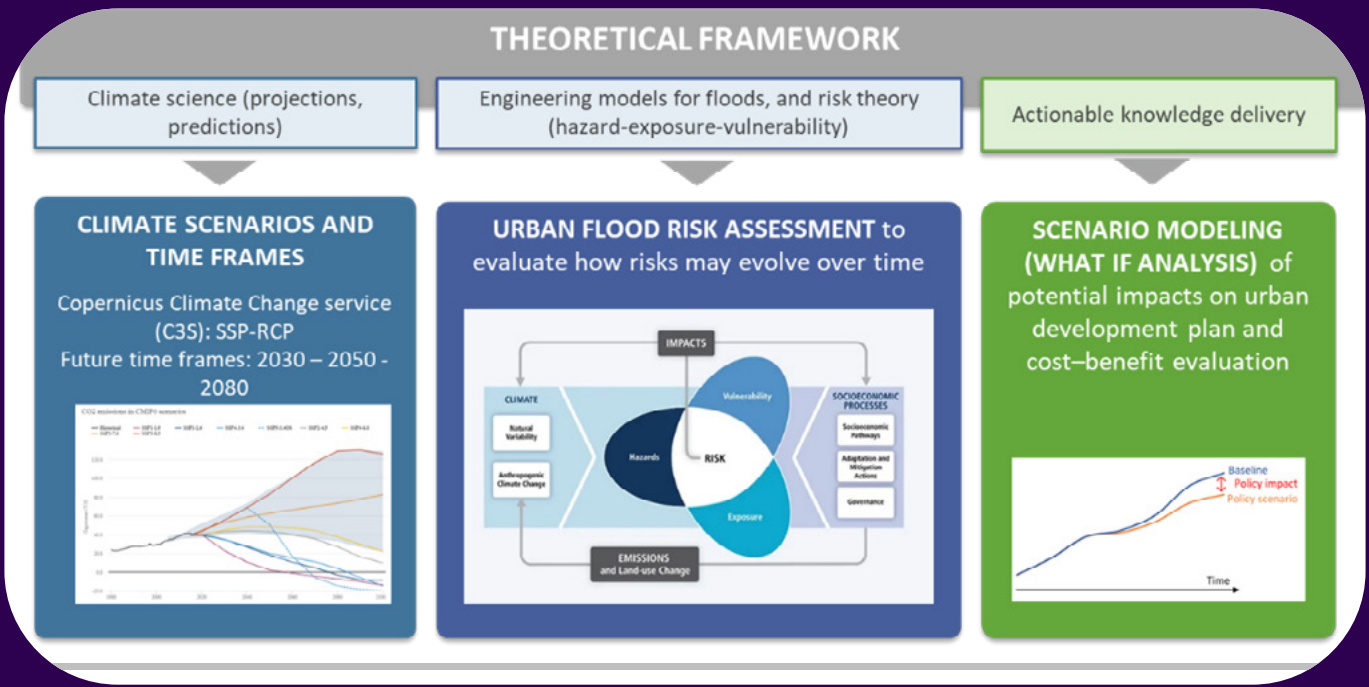
Copernicus

FLOODGUARD

MAIN CONTRACTOR:
SINGULARLOGIC INFORMATION SYSTEMS AND SOFTWARE TECHNOLOGY S.A.
WWW.SINGULARLOGIC.EU

OTHER CONSORTIUM MEMBERS:
- **FUNDACION CARTIF**
  WWW.CARTIF.ES/EN/HOME/
- **NAZKA MAPPS**
  WWW.NAZKA.BE/EN/

FLOODGUARD is an AI-powered climate service that enables cities to assess and anticipate flood risks by integrating Copernicus Earth Observation data, high-resolution hydrodynamic modelling, and AI algorithms. It supports both short-term forecasts (up to 96 hours) and long-term climate adaptation planning. The system features a hybrid physical-AI modelling approach, dynamic socio-economic vulnerability assessment, and a Digital Twin environment for simulating flood scenarios. FLOODGUARD enhances municipal preparedness, infrastructure protection, and equitable urban resilience, offering a scalable, interoperable solution that transforms data into actionable insights for sustainable flood management.



CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Urban development and cultural heritage

Innovativeness of the Solution

FLOODGUARD introduces a paradigm shift in urban flood hazard management by integrating advanced Earth Observation (EO) intelligence, hybrid AI-hydraulic forecasting models, socioeconomic risk analytics and interactive digital twin environments into a unified and operational decision-support platform tailored to city needs. Its innovativeness lies in transforming complex datasets into actionable insights for proactive city management.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

FLOODGUARD improves flood preparedness, reduces property damage, and minimizes disruptions to daily life. It strengthens institutional capacity by fostering informed decision-making. It increases community awareness through citizen-facing risk visualizations, ultimately fostering public trust and proactive engagement in climate adaptation.

END-USER / CUSTOMER PROFILE

- Municipalities
- Urban planners
- Civil protection units
- Infrastructure and climate officers

TYPE OF CITIES TARGETED

Urban areas prone to pluvial and fluvial flooding, including mid-size and large EU cities.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus

Climate Change Service
climate.copernicus.eu

Emergency Management

Land Monitoring Service

FlowDT

MAIN CONTRACTOR:
GEO SOLUTIONS NV
WWW.GEOSOLUTIONS.BE

FLOWDT aims to build a next-generation Urban Mobility Digital Twin to help cities tackle congestion, pollution and pressure on public space through smarter, data-driven strategies. By combining traffic and environmental data – from satellites, local sensors, and vehicles – FlowDT enables detailed analysis of mobility patterns impacting air quality, public health, and the use of urban space. It bridges the gap between large-scale environmental intelligence and street-level mobility data, offering planners a holistic view of challenges and opportunities. FlowDT will simulate the effects of proposed transport interventions, such as new transit lines or traffic restrictions, supporting evidence-based planning and proactive policymaking. The result is a scalable, cloud-based platform that delivers actionable insights to decision-makers and offers citizens a clear, engaging view into mobility scenario's, trade-offs, and their potential impacts on everyday urban life.

CHALLENGE ADDRESSED

Sustainable mobility

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Road and automotive
- Urban development and cultural heritage

Innovativeness of the Solution

FlowDT fuses large-scale environmental monitoring with local mobility insights in a unified digital twin platform, bridging macro and micro urban dynamics. The result is an interactive platform that empowers decision-makers with predictive simulations and evidence-based insights, while engaging citizens in mobility scenario exploration. FlowDT's holistic approach transcends conventional traffic models, making it a powerful, adaptable tool for sustainable, data-driven urban mobility planning.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

FlowDT will improve urban mobility and create more sustainable, liveable EU cities through:

- Improving urban air quality
- Providing cities with transparent insights regarding mobility policies
- Aiding cities to optimize investments using data-driven simulations
- Reducing economic costs through removing mobility inefficiencies

END-USER / CUSTOMER PROFILE

- Urban planners
- Transportation authorities
- Potentially impacted citizens

TYPE OF CITIES TARGETED

City size can range from small to large/metropolitan. FlowDT is fully scalable.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO

Copernicus

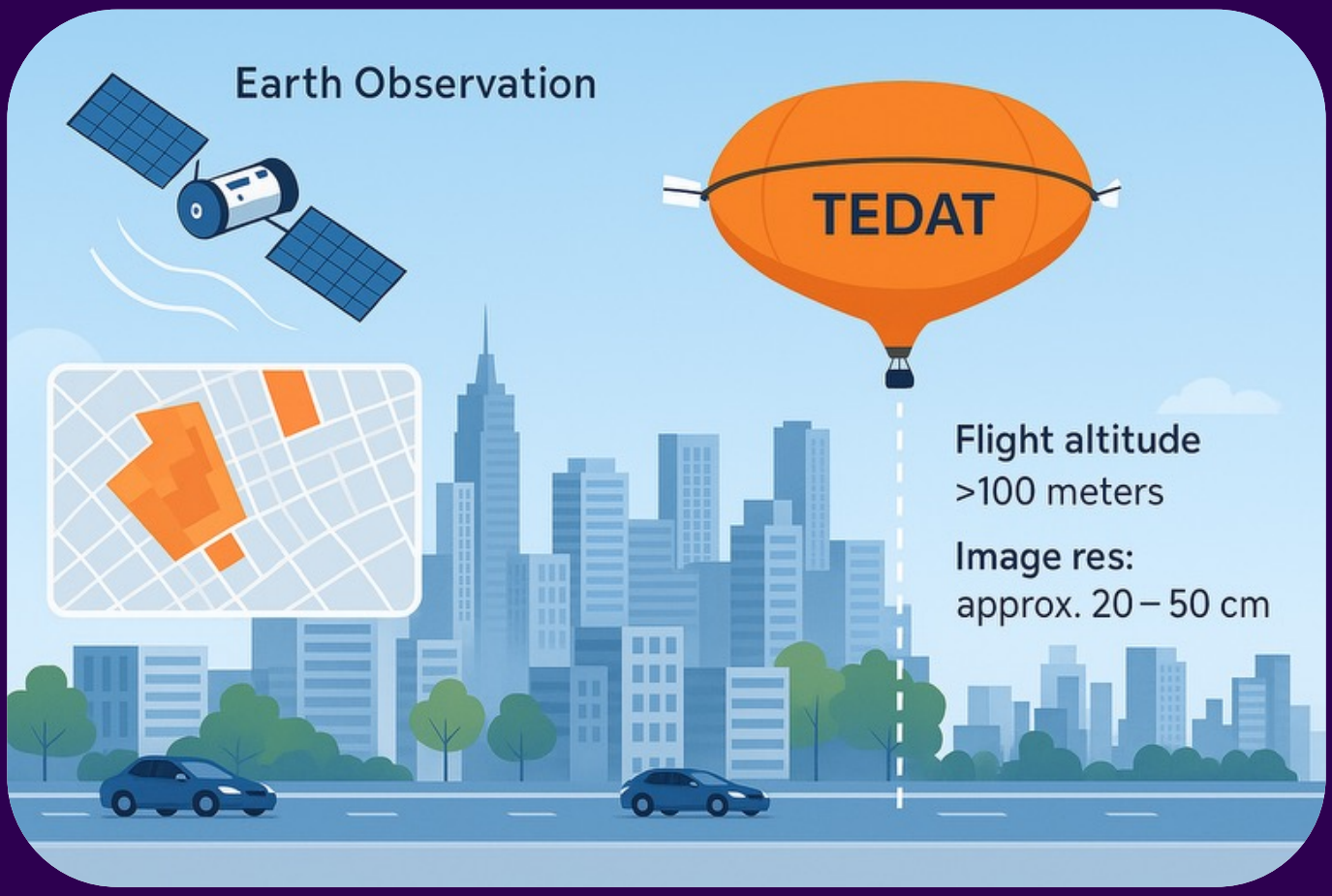
Atmosphere Monitoring Service
atmosphere.copernicus.eu

FUSECITY

MAIN CONTRACTOR:
ZERO GRAVITY OY
WWW.ZEROGRAVITY.FI

OTHER CONSORTIUM MEMBERS:
HYBRID-AIRPLANE TECHNOLOGIES GMBH
WWW.H-AERO.COM/EN

EO DATA from Zero Gravity's UrbanAI platform identifies urban heat islands and emission hotspots. TEDAT balloons from Hybrid-Airplane Technologies GmbH then collect high-resolution, altitude-specific data—such as temperature, humidity, noise, and 5–50 cm thermal imagery—over identified hotspots. This data is fused into 3D microclimate models for use in climate adaptation, urban planning, and traffic management. The system is modular, mobile, EO-triggered, and easily integrated into city dashboards—empowering smarter, greener, and more responsive urban governance across Europe.



CHALLENGE ADDRESSED

Climate resilience

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Urban development and cultural heritage

Innovativeness of the Solution

Combines EO data with real-time TEDAT balloon data for 3D microclimate insights. TEDAT balloons deliver high-resolution, altitude-specific data on heat, noise, emissions, traffic, and 5–50 cm thermal imagery for pinpointing heat loss, surface temperature gradients, and urban heat mapping. UrbanAI fuses this into dynamic 3D city models for climate adaptation, traffic optimization, and zoning. Modular, mobile, EO-triggered, and scalable.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Reduces emissions, heat exposure through targeted EO-aerial sensing. Enables faster, data-driven decisions for climate resilience, mobility, and urban planning. Lowers operational costs and boosts citizen well-being through transparent, real-time environmental monitoring.

END-USER / CUSTOMER PROFILE

- City departments needing real-time data on heat islands, emissions, noise, and traffic

TYPE OF CITIES TARGETED

Medium to large EU cities facing urban heat, pollution, or traffic issues and pursuing green goals.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus

Atmosphere Monitoring Service
atmosphere.copernicus.eu

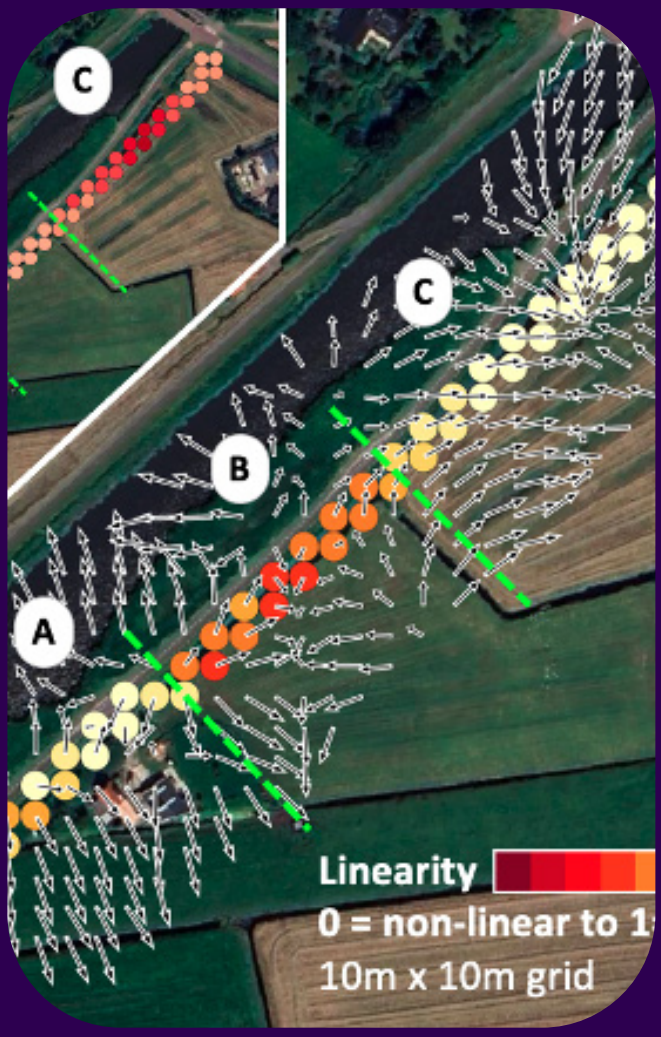
sentinel-3

sentinel-5p

GeoRisk Monitor

MAIN CONTRACTOR:
SURVINTEL
WWW.SURVINTEL.COM

OTHER CONSORTIUM MEMBERS:
GISAÏA
WWW.GISAIA.COM



GEORISK MONITOR is a cloud-based web platform that empowers cities to proactively manage the risks posed by ground deformation to civil infrastructure. By transforming satellite data into actionable geological insights, the platform enables detailed monitoring of land displacement and infrastructure stress at a city-wide or site-specific scale.

It provides detailed maps showing the evolution of stress affecting structures, facilitating detailed, site-specific investigations. Users can define areas of interest, create cross-sections, filter by time, and set custom alerts for early warnings on instabilities in roads, railways, and dams.

By integrating GeoRisk Monitor into infrastructure planning and maintenance workflows, cities can shift from reactive to proactive risk management—enhancing climate resilience and reducing vulnerability to extreme weather events. It enables the early detection of structural weaknesses and supports post-disaster assessments of critical infrastructure such as bridges, levees, and buildings.

CHALLENGE ADDRESSED

Climate resilience

Sustainable mobility

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Energy and Raw materials
- Infrastructure
- Rail
- Road and automotive
- Urban development and cultural heritage

Innovativeness of the Solution

GeoRisk Monitor offers high-resolution (10m x 10m) 3D maps, allowing users to assess stress on specific infrastructure elements like bridge pillars or tunnel sections.

It ensures precise alignment of measurement points with specific infrastructure using advanced geoscience techniques, eliminating ambiguity.

It provides full 3D displacement data—including north-south motion—enabling accurate detection of complex deformation and better understanding of underlying causes.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

GeoRisk Monitor helps cities extend infrastructure lifespan through early stress detection, cut maintenance costs, enhance public safety by preventing structural failures, and reduce traffic disruptions by identifying risks early, thereby minimizing downtime from unplanned repairs.

END-USER / CUSTOMER PROFILE

Professionals in

- infrastructure
- risk managemen
- environmental resilience

TYPE OF CITIES TARGETED

Any city committed to structural integrity of its infrastructure and the safety of its residents.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

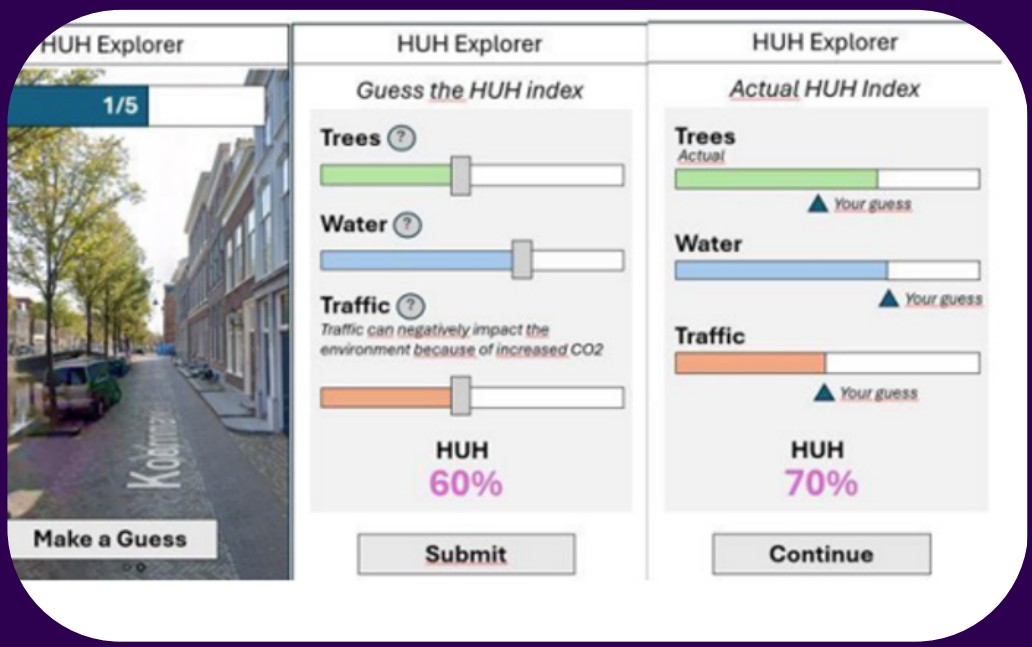
Copernicus

Land Monitoring Service

HUHI

MAIN CONTRACTOR:
CGI NEDERLAND B.V.
WWW.CGI.COM/NL/NL/RUIMTEVAART

URBAN HABITAT INDEX which provides a scalable, data-driven approach to urban planning that integrates real-time Earth Observation (EO) data with AI and GIS-based Multi-Criteria Decision Analysis. By combining satellite-derived indicators—such as land surface temperature, land cover, and emission patterns—with ground-based air quality sensor data, we offer an up-to-date, spatially detailed view of urban health stressors. This index serves as a dynamic layer within digital city models, enabling cities to simulate and visualize environmental risks, assess the impact of policy scenarios, and proactively manage urban infrastructure. It bridges the current gap between remote sensing and on-the-ground validation, ensuring that digital twins remain accurate, actionable, and aligned with citizens' needs.



CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

The innovation lies not only in the development of the HUH Index as a single, interpretable metric that captures multiple urban stressors and relievers, but also in the workflow architecture as stakeholders will also be able to adjust weights based on the priority of the issue they wish to solve.

The user interface will host a web-based GIS platform with real-time scenario modelling, a gamified public facing component, and seamless integration with city systems and local ground sensor data.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Types of actionable insights include:
- Identifying heat and pollution hotspots in real-time
- Detecting the areas with low green/blue infrastructure
- Prioritizing infrastructure improvements in vulnerable areas
- Simulating the effects of new zoning regulations or green infrastructure investments
- Balancing industrial or mobility infrastructure demands with environmental and public health goals
- Monitoring the long-term impact of climate adaptation policies on urban liveability

END-USER / CUSTOMER PROFILE

- City Planners and Urban Designers
- Municipal Governments and Environmental Departments
- Public Health Agencies

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus

OptimGreen

MAIN CONTRACTOR:
OPTIM.AIZE
WWW.OPTIMAIZE.FR

OptimGreen – Optimized greening for resilient cities proposes a novel satellite data based decision support system to help cities optimize urban greening while preventing soil instability and infrastructure damage. Addressing both the Climate Resilience and Digital Urban Planning challenges, the solution transforms Copernicus and Galileo data into actionable risk and vegetation maps. It identifies optimal zones for tree planting by integrating heat, flood, and soil deformation analytics, enabling evidence-based climate adaptation. Advanced models predict subsidence linked to clay shrink-swell cycles, while a Galileo-calibrated InSAR pipeline ensures millimeter-scale accuracy. The solution integrates seamlessly with city GIS and digital twins, offering intuitive dashboards for planners and policymakers. By reducing emergency repairs and enhancing livability, it delivers a scalable, data-driven approach to build more resilient and sustainable urban environments.

CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

Space Data fusion to enables millimeter-accurate, real-time monitoring of soil risks. AI-driven models predict the impact of greening on ground stability. The solution integrates seamlessly with city GIS systems via open standards and delivers intuitive dashboards. It uniquely isolates seasonal clay shrink–swell cycles from InSAR data, transforming raw satellite streams into actionable urban resilience insights, ready for integration into digital twins.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

The solution reduces urban heat, flood risks, and infrastructure damage through optimized greening. It improves air quality, public health, and livability while lowering maintenance costs. It fosters citizen engagement, supports climate goals, and promotes sustainable, inclusive urban development.

END-USER / CUSTOMER PROFILE

- City planners
- Climate officers
- Public works teams
- Smart city departments in European cities

TYPE OF CITIES TARGETED

Medium to large European cities facing climate, soil stability, or infrastructure resilience challenges.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO

Copernicus

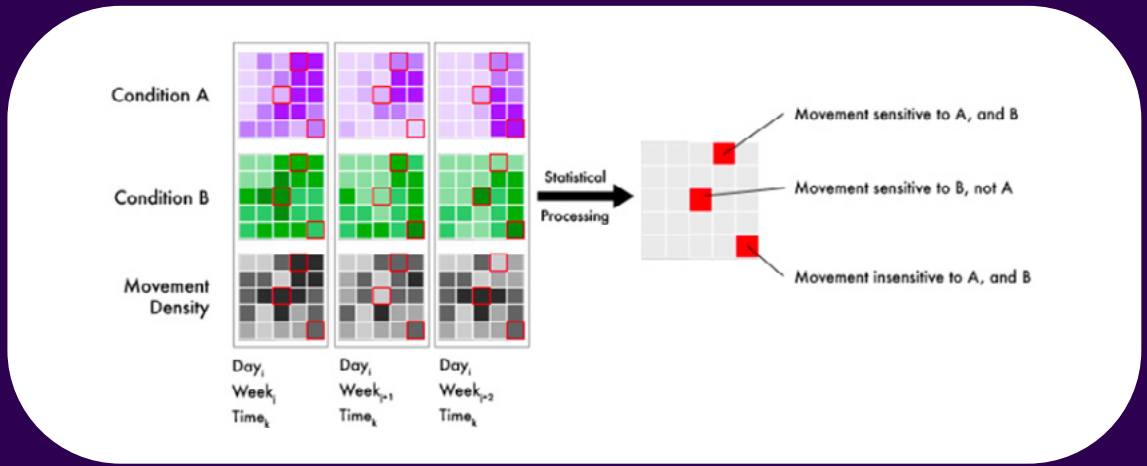
Climate Change Service

Emergency Management

UMIS

MAIN CONTRACTOR:
ORG URBANISM & ARCHITECTURE BV
WWW.ORGPERMOD.COM

THE URBAN MOVEMENT INTELLIGENCE SYSTEM (UMIS) addresses the Digital Urban Planning & Management, Sustainable Mobility, and Climate Resilience challenges. It integrates high-resolution GPS movement data with Copernicus Sentinel satellite imagery and other urban datasets to provide dynamic, empirically based insights into urban dynamics. UMIS empowers cities to make data-driven decisions by creating an advanced digital twin that monitors how people and their movement patterns respond to environmental changes, infrastructure, and services. It enables dynamic management of infrastructure and public spaces, enhances climate adaptation, and supports safer mobility networks.
The system offers real-time evaluation through standardized geospatial layers and interactive dashboards. UMIS ensures interoperability with existing municipal GIS systems using open standards (GeoJSON, OGC) and adheres to GDPR for privacy.
UMIS aims to improve urban planning across Europe by generating and leveraging new data to improve city liveability, resource efficiency, and resilience.



CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

Sustainable mobility

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Infrastructure
- Road and automotive
- Urban development and cultural heritage

Innovativeness of the Solution

It uniquely integrates high-resolution GPS movement data (10m precision) with Copernicus Sentinel satellite imagery and diverse urban datasets to form an advanced digital twin, linking human movement to environmental conditions. The system provides empirically based human mobility insights, enabling dynamic urban management and real-time intervention evaluation. This offers actionable intelligence for unified urban planning, sustainable mobility, and climate resilience.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

UMIS allows for enhanced climate adaptation and promotes green cities. Socially, it creates safer, more accessible networks, adapting environments to lived experiences, improving liveability. Economically, it ensures efficient resource use, can better optimize transport, and enables cost-saving dynamic service adjustments, fostering smarter urban planning.

END-USER / CUSTOMER PROFILE

- Interdepartmental city planning stakeholders
- Urban planners
- Policymakers
- Developers

TYPE OF CITIES TARGETED

Cities experiencing urban heat, air pollution, floods, and mobility congestion, seeking space-based solutions.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO

Copernicus

Climate Change Service

Land Monitoring Service

Atmosphere Monitoring Service

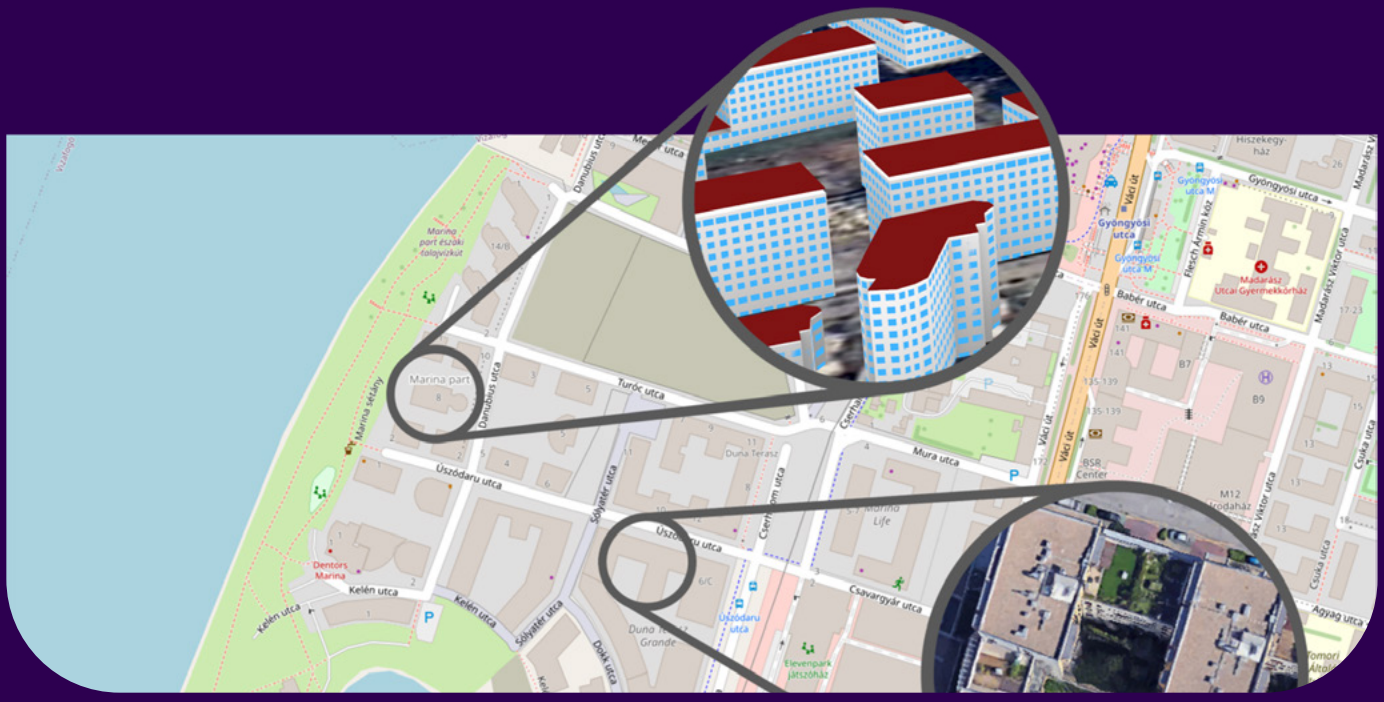
Urban Energy Scan

MAIN CONTRACTOR:
PAULINYI&PARTNERS INNOVATIONS KFT.
WWW.PPINNOVATIONS.EU

Paulinyi & Partners

OTHER CONSORTIUM MEMBERS:
- **FRAUNHOFER GESELLSCHAFT FÜR ANGEWANDTE FORSCHUNG E.V. WWW.FRAUNHOFER.DE/EN.HTML**
- **PAULINYI&PARTNERS ZRT. WWW.PAULINYIANDPARTNERS.HU**

URBAN ENERGY SCAN is a platform that combines Copernicus EO data, AI, and digital twins to support urban energy planning and climate resilience. It enables cities to simulate energy interventions, analyze building emissions, and plan retrofits at the building or district scale. AI-enhanced EO processing feeds into UHI and energy models, visualized in dashboards for decision-making. The system extracts up to 23% of energy model inputs from EO data, with 12% inferred via AI. It supports open standards (SHP, IFC, CityGML) and integrates with tools like City Energy Analyst and Civil 3D. Designed for modularity and scalability, it supports real-world piloting and aligns with EU privacy and sustainability standards. The solution empowers cities to test policy impacts early, reduce GHG emissions, and plan for long-term energy transitions.



CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Energy and Raw materials
- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

The solution uniquely integrates EO data, AI-based building data extraction, and urban energy simulation into one seamless workflow. It extracts key building attributes from satellite data, reducing the need for manual surveys. Results are visualized via digital twins and KPI dashboards, enabling scenario-based policy planning and fast, scalable deployment across city systems using open standards and FIWARE interoperability.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Reduces GHG emissions and energy use through retrofit planning, supports renewable integration, accelerates city planning cycles, improves energy infrastructure efficiency, and enables data-driven, and climate-resilient urban development.

END-USER / CUSTOMER PROFILE

- Municipal urban planners
- Sustainability officers
- Policy makers
- Urban developers

TYPE OF CITIES TARGETED

Medium to large EU cities aiming to improve data-driven urban and energy planning.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus

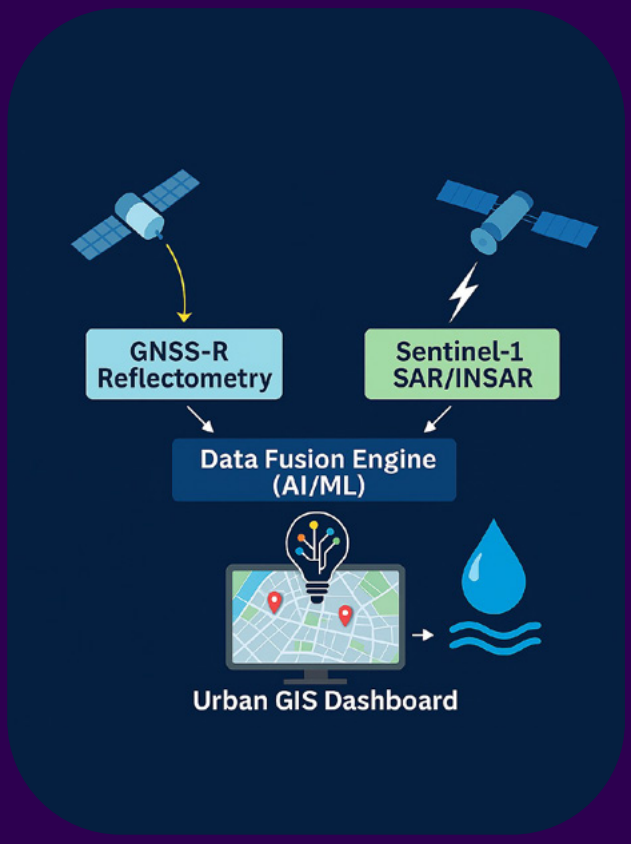
Climate Change Service
climate.copernicus.eu

Land Monitoring Service

URBAN-LENS

MAIN CONTRACTOR:
NEPTUNE SRL
WWW.NEPTUNEWATERLEAKS.COM

OTHER CONSORTIUM MEMBERS:
COSMIC SRL
WWW.COSMICWATERLEAKS.SPACE



URBAN-LENS (URBan Analytics with Layered Earth observation and Navigation Signals) is an innovative system developed by Neptune Srl and Cosmic Srl for monitoring water leaks in urban networks. By integrating GNSS Reflectometry (GNSS-R) and Sentinel-1 SAR radar imagery, URBAN-LENS enables early and accurate detection of soil moisture anomalies and ground deformation caused by underground water leaks. The system leverages AI-driven data fusion to correlate GNSS-R signals with SAR-based interferometric analyses, providing continuous, high-resolution spatial-temporal insights. This significantly reduces intervention times, maintenance costs, and non-revenue water losses, enhancing urban water infrastructure management. With its scalable architecture, interoperability, and compliance with open standards, URBAN-LENS effectively adapts to diverse urban contexts, supporting cities in proactive resource management, infrastructure resilience, and climate adaptation strategies.

CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

URBAN-LENS uniquely combines GNSS Reflectometry and Copernicus SAR/Multispectral to detect and geolocate underground water leaks with high spatial precision and subsoil penetration. Its AI-powered data fusion engine correlates moisture anomalies and ground deformation for accurate risk classification. Easily installed on any vehicles, it delivers continuous, non-invasive monitoring and integrates seamlessly with GIS systems to support sustainable, predictive urban asset management.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

URBAN-LENS enables cities to proactively reduce water losses, CO_2 emissions, and infrastructure costs by leveraging satellite-based GNSS-R and SAR technologies. Citizens benefit from reliable water supply, fewer disruptive excavations, and safer streets. The environment gains from better water preservation and energy efficiency.

END-USER / CUSTOMER PROFILE

- Municipal utilities and smart city departments managing water and underground infrastructure

TYPE OF CITIES TARGETED

Medium to large European cities with aging water networks and smart infrastructure ambitions.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO Copernicus

UrbanROOTS

MAIN CONTRACTOR:
CEIIA – CENTRO DE ENGENHARIA E DESENVOLVIMENTO
WWW.CEIIA.COM

URBANROOTS is an Earth Observation-based solution designed to help cities manage public spaces, optimize green areas, and strengthen climate resilience. Built on CEiiA's "EO Clarity" platform, it combines Copernicus Sentinel data with very-high-resolution imagery from GEOSAT, together with in situ and smart city datasets fused to deliver automated insights on land use, vegetation (tree) inventory and dynamics, and carbon sequestration. The platform enables frequent monitoring with early detection of unauthorized land changes, and assessment and evolution of green area health. Tailored dashboards support urban planners, environmental teams, and policymakers with actionable indicators, mainly focusing on achieving their own climate and biodiversity goals. Through scalable, modular design and data integration APIs, UrbanROOTS enables operational integration into smart city platforms and new digital twin frameworks for urban climate intelligence.

CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Urban development and cultural heritage

Innovativeness of the Solution

UrbanROOTS uniquely combines Copernicus and very high-resolution satellite imagery from GEOSAT with smart city datasets to deliver automated, near-real-time insights on land cover, vegetation and tree characterization, and carbon sequestration potential. It is built on a modular, AI-ready SaaS platform, that enables scalable and integrated deployment with customization and localization features that consider the climate and biodiversity reality of each city.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Enables cities to monitor green areas, enforce zoning, and respond faster to land use change. Supports carbon sequestration tracking, climate adaptation, and biodiversity goals. Enhances planning efficiency and data-driven investment, delivering environmental, social, and economic value.

END-USER / CUSTOMER PROFILE

- Urban planners
- Sustainability departments
- Public works
- Smart city program leads

TYPE OF CITIES TARGETED

Cities with climate goals, green planning needs, and digital governance maturity.

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

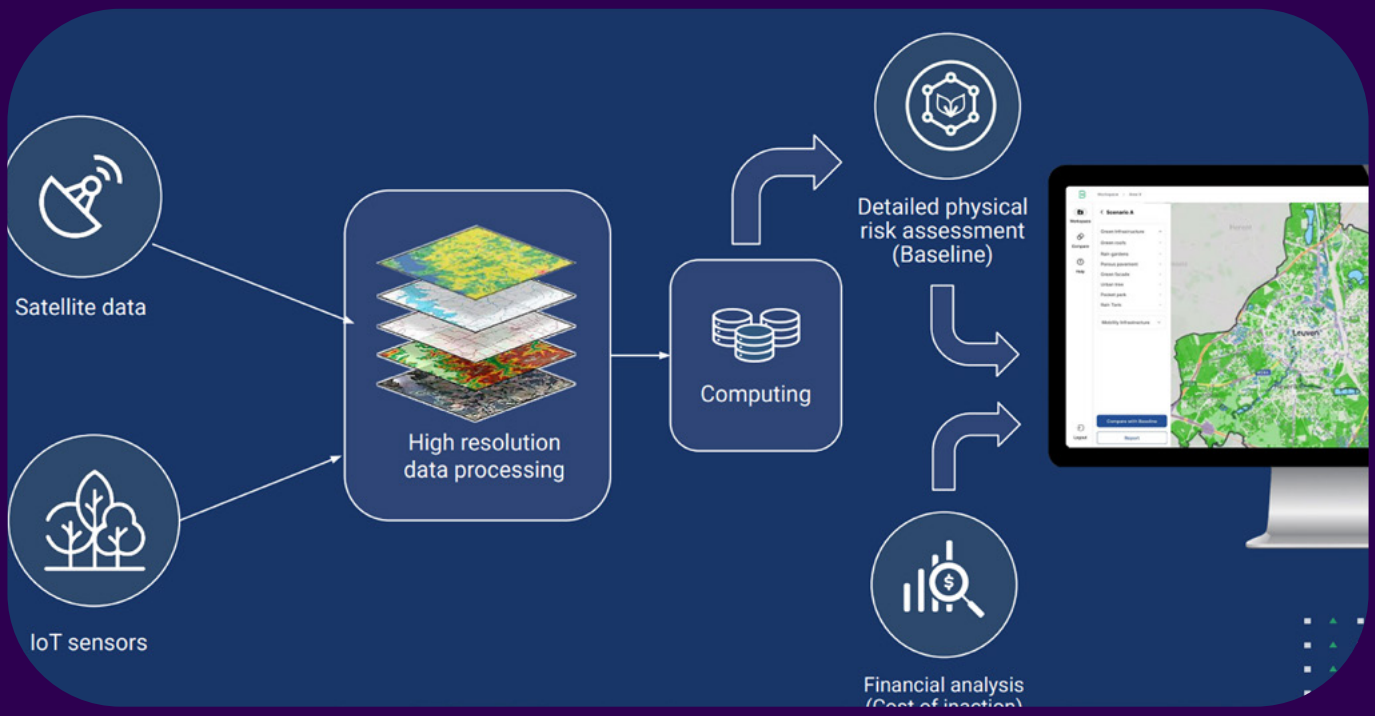
Copernicus Emergency Management

VISTA

MAIN CONTRACTOR:
BITAGREEN BV
WWW.BITAGREEN.IO

OTHER CONSORTIUM MEMBERS:
- **CLIMATE SCALE**
  WWW.CLIMATESCALE.COM
- **TREESENSE GMBH**
  WWW.TREESENSE.NET

THE PLATFORM COMBINES satellite imagery, local climate forecasts and real-time sensor data to deliver actionable insights. It enables early warnings for vegetation stress, smarter irrigation and maintenance, and better planning for biodiversity and ecosystem performance. Unlike conventional tools, it connects monitoring with action—cutting costs, extending asset lifespan, and aligning investments with climate goals. The system is modular, user-friendly and integrates with city systems, supporting compliance with EU strategies on resilience and nature-based solutions. Co-developed with public authorities through the SPACE4Cities initiative, the platform is moving from prototype to real-world use at TRL8, helping cities turn fragmented data into faster, better decisions.



CHALLENGE ADDRESSED

Climate resilience

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Emergency management and humanitarian aid
- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

Integrated platform combining Copernicus data, local climate forecasts and real-time sensors to enable proactive green infrastructure management. Helps cities scale nature-based solutions and ensure long-term performance, while reducing operational costs, improving vegetation vitality and sustaining ecosystem service delivery.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

The solution helps cities reduce vulnerability to heat, floods and biodiversity loss, while improving urban resilience with enhanced management of green infrastructure. It supports more equitable access to green space and data-driven maintenance—lowering costs, enhancing liveability and aligning with EU adaptation and sustainability goals.

END-USER / CUSTOMER PROFILE

- City planners
- Climate officers & maintenance teams managing urban green infrastructure

TYPE OF CITIES TARGETED

Medium to large European cities with climate plans and green infrastructure commitments

EU SPACE DATA AND SERVICES USED IN THE SOLUTION

Copernicus

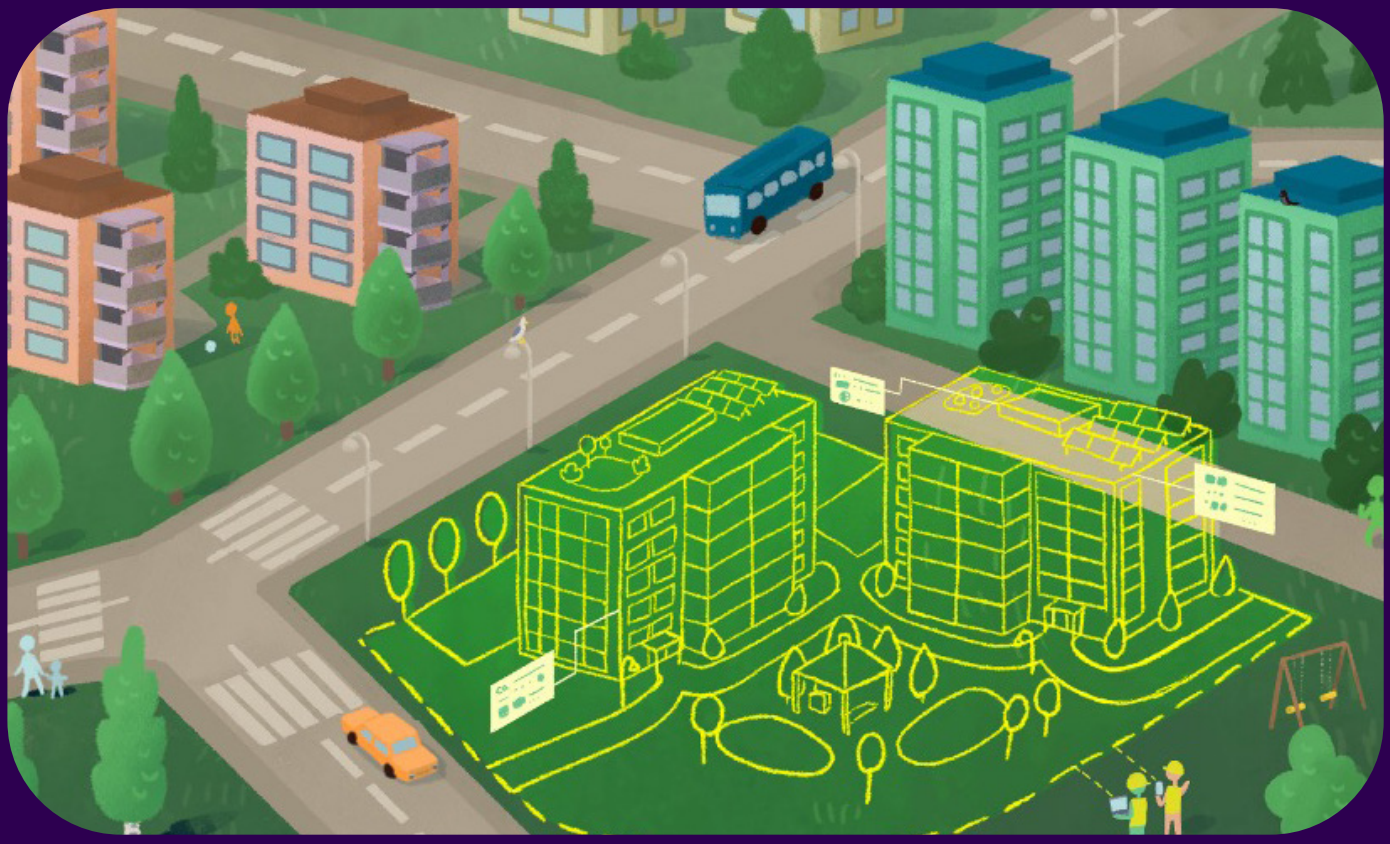
Climate Change Service
climate.copernicus.eu

Land Monitoring Service

ZIM

MAIN CONTRACTOR:
AVOIN MAP
MAP.AVOIN.ORG

URBAN PLANNING TEAMS across Europe are under pressure to incorporate climate adaptation, biodiversity protection, and citizen well-being into land-use decisions. Avoin Map offers a digital platform that enables dynamic management of zoning plans, with automated climate and ecological impact assessments, accessible visualisations, and tools to iteratively test and improve planning proposals.



CHALLENGE ADDRESSED

Urban planning and management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED

EUSPA MARKET SEGMENTS

- Climate, Environment and Biodiversity
- Energy and Raw materials
- Infrastructure
- Urban development and cultural heritage

Innovativeness of the Solution

ZIM is the first platform to integrate Copernicus data and AI-assisted zoning impact modelling in one open-source tool. It enables 70-year CO_2e forecasts, biodiversity metrics, and public health indicators from zoning data. Modular, transparent, and scalable across national contexts, it supports Digital Twin integration.

How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Helps cities avoid high-emission zoning, protect biodiversity, and plan climate-positive offsets. Improves public health and trust through greener environments and transparent, inclusive planning, while enabling cost-effective compliance with EU climate targets.

END-USER / CUSTOMER PROFILE

- Zoning officers
- Urban planners
- Municipal sustainability units
- Spatial consultants

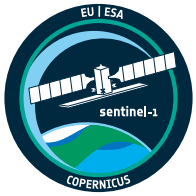
TYPE OF CITIES TARGETED

EU cities, which are facing land-use pressure and climate/ biodiversity planning needs.

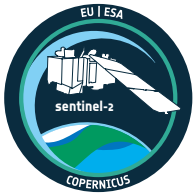
EU SPACE DATA AND SERVICES USED IN THE SOLUTION

GALILEO · Copernicus · Climate Change Service · Emergency Management · Atmosphere Monitoring Service · Sentinel-1 · Sentinel-2

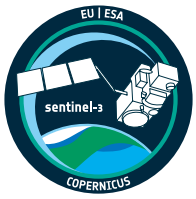
The most urban-relevant Copernicus Sentinels



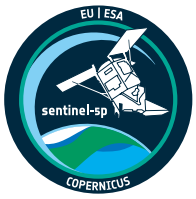
A mission composed of two satellites operated ESA. Its data is used for monitoring ground deformation and displacements affecting infrastructure. The radar imagery it provides is also valuable for mapping building heights and urban growth and detecting changes in urban sprawl, informal settlements, floods and land use.



A mission composed of two satellites operated by ESA. Sentinel-2 monitors urban land use and its changes, including urban sprawl, informal dwellings and urban green spaces, notably vegetation health. It can also support Sentinel-3 to assess urban heat islands. Lastly, Sentinel-2 contributes to disaster risk management after events such as floods and fires.



A mission composed of two satellites operated by EUMETSAT in cooperation with ESA, Sentinel-5 Precursor delivers Land Surface Temperature (LST) data which can be used to identify urban heat islands.



A mission composed of one satellite operated by ESA, notably used to contribute to air quality monitoring in urban areas.

The most urban-relevant Copernicus Services

Atmosphere Monitoring Service
atmosphere.copernicus.eu

Implemented by the European Centre for Medium-range Weather Forecasts (ECMWF), the Copernicus Atmosphere Monitoring Service (CAMS) provides urban air quality forecasts and monitors pollutants affecting public health. This includes particulate matter and greenhouse gas emissions like CO2 and methane. For instance, its information helps to assess the consequences of urban infrastructure on their local environment. Also, CAMS monitors wildfires in order to estimates their impact on air quality.

Climate Change Service
climate.copernicus.eu

Implemented by the European Centre for Medium-range Weather Forecasts (ECMWF), the Copernicus Climate Change Service (C3S) provides essential climate data and models like ERA5 to understand past, present, and future climate change impacts. These impacts include urban heat islands, drought, extreme weather events or seal-level rise on built infrastructure (like cultural heritage), on urban green spaces or on urban operations like construction or public transportation. It is thus an instrumental source of data for adaptation planning, monitoring and evaluation (M&E) even at the local scale.

Emergency Management

Implemented by the European Commission' Joint Research Centre (JRC), the Copernicus Emergency Management Service (CEMS) provides data and information for urban disaster risk management, including prevention, preparedness, response, and recovery activities. It offers monitoring for hazards like floods, droughts, wildfires, and ground deformation such as subsidence and landslides. Through early warning systems and rapid mapping during crises, it aids urban planners in monitoring risks to infrastructure and cultural heritage from natural and man-made disasters.

Land Monitoring Service

Implemented by the European Environment Agency (EEA), the Copernicus Land Monitoring Service (CLMS) maps detailed urban land cover, land use, and changes, aiding urban planning and growth monitoring. Its Urban Atlas is a key dataset in this regard. CLMS helps assess urban heat islands and monitors urban green spaces and trees. Additionally, it monitors ground deformation impacting infrastructure and cultural heritage at millimetre-level. Reversely, CLMS data helps monitor the environmental impacts of infrastructures.

The most urban-relevant Galileo Services

Galileo Open Service (OS)

As the main Galileo service, the OS is the most utilised signal for positioning, navigation and timing (PNT) applications. Such signal is sent to compatible receivers which then convert the signal into data. This "Galileo-derived data" is hence stored by the device on which the receiver is embedded. Within urban areas, it provides precise positioning and improves the coordination of activities in cities (waste management, public transport, construction, etc.). It is particularly beneficial for urban planners by allowing for impact assessment and planning of construction projects and existing infrastructure, and it improves surveying accuracy. Of course, Galileo is crucial for navigation applications like route planning and real-time guidance in urban areas. Lastly, Galileo enables two methods which support climate modelling: GNSS radio occultation sounding and GNSS reflectometry.

Galileo High-Accuracy Service (HAS)

As a Galileo service, Galileo HAS provides decimetre-level positioning accuracy, crucial for precise cadastres, urban surveying and mapping. It offers improved precision and availability in urban canyons, enhancing location-based services and navigation as well as autonomous vehicles and micromobility solutions requiring high accuracy in cities. In addition to this, its precision supports monitoring urban infrastructure like cultural heritage and rail lines for stability and deformation.

FOR MORE INFORMATION ON URBAN-RELEVANT SPACE DATA AND SERVICES:

- Report on Climate, Environment and Biodiversity User needs and Requirements, © European Union Agency for the Space Programme, 2024.
- Report on Public Transport User needs and Requirements, © European Union Agency for the Space Programme, 2024.
- Report on Road and Automotive User needs and Requirements, © European Union Agency for the Space Programme, 2024.
- Report on Infrastructure User needs and Requirements, © European Union Agency for the Space Programme, 2023.
- DOWELL, M., BERNARD, S., KILSEDAR, C., GIANINETTO, M., SPEYER, O., KUFFER, M., GRECCHI, R., GLIOTTONE, I. and MELCHIORRI, M., *Earth Observation in support of EU policies for urban climate adaptation*, Publications Office of the European Union, Luxembourg, 2025, https://data.europa.eu/doi/10.2760/4619381, JRC140369.

SPACE 4Cities

space4cities.eu

FORUM VIRIUM HELSINKI

City of Amsterdam

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MUNICÍPIO DE GUIMARÃES

OPEN & AGILE SMART CITIES & COMMUNITIES

District

REGIONAL DEVELOPMENT FUND OF ATTICA