



Innovation Catalogue

10 Solutions Funded by SPACE4Cities



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ISBN: 978-952-386-699-7 (PDF)
ISBN: 978-952-386-698-0 (print)

Forum Virium Helsinki
Unioninkatu 24
00130 Helsinki, Finland
forumvirium.fi/en

Printed in Finland, 2026
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space4cities.eu



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.

Foreword

Scaling up space solutions for smarter cities

FOR NEARLY TWO YEARS, the tremendous engagement witnessed by SPACE4Cities has proved the necessity of creating lasting bonds between the space industry and urban players—municipalities, regions, and public agencies. Today, as we progress on Phase 2 of our Pre-Commercial Procurement (PCP), this collaboration has shifted from vision to tangible R&D development.

The urban-space synergy

Local authorities continue to face a complex web of interconnected challenges: climate change impacts, biodiversity loss, air quality, and the urgent drive toward climate neutrality. Simultaneously, the space downstream industry has reached a tipping point. With the EU's Earth Observation (EO) and GNSS market projected to reach €55 billion by 2033¹, the public sector remains the primary engine of this growth.

SPACE4Cities acts as the vital bridge, ensuring:

- Local authorities master the procurement of fit-for-purpose, satellite-based solutions.
- Suppliers navigate public sector requirements to deliver high-impact, sustainable services.

Entering Phase 2: From 20 to 10 European suppliers

The project has now reached a critical milestone. After a competitive design phase involving 20 initial contractors, we have selected 10 leading suppliers to move into Phase 2: Prototype Development.

In this phase, the abstract becomes concrete. These 10 consortia are transforming their conceptual designs into functional prototypes between November 2025 and

April 2026, specifically engineered to integrate Galileo's precision and Copernicus's data to solve real-world urban planning and climate adaptation issues. SPACE4Cities remains the first European PCP to explicitly blend these technologies for the betterment of public spaces.

The Innovation Catalogue: Phase 2 Edition

More than just a €2.87M R&D funding opportunity, SPACE4Cities is a collective enabling programme. Aerospace Valley, member of the consortium, provides hands-on support to ensure these 10 solutions are not just innovative, but commercially viable and interoperable.

This updated Innovation Catalogue is your guide to these 10 selected prototypes. Designed for European cities, R&I stakeholders, and the general public, it highlights:

- **Prototype maturity:** How these solutions are being tested in real urban environments.
- **Use cases:** Concrete applications ranging from dynamic urban greening to smart mobility and infrastructure monitoring.
- **Integration:** How complex satellite data is translated into "down-to-Earth" dashboards for city managers.

The vibrant visuals and technical depth within these pages demonstrate that space applications are no longer "futuristic"—they are essential tools for today's resilient cities.

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

Index of solutions

AI-WUIFIRE

– Prevention of wildfire risks

6

CHERISH

– Protection of cultural heritage sites

10

CityMotion

– AI agents for urban stability and infrastructure

14

CLIMAPS

– Detection of heat islands, floods, and extreme weather events

18

DYNAMO-SM

– Traffic emission reductions

22

GeoRisk Monitor

– Monitoring of the condition of bridges, roads, and railways

26

OptimGreen

– Strategic planning of urban green spaces

30

URBAN LENS

– Tracing of underground pipe leaks

34

UrbanRoots

– Monitoring the condition and changes of green spaces

38

VISTA

– Management of green areas and biodiversity

42

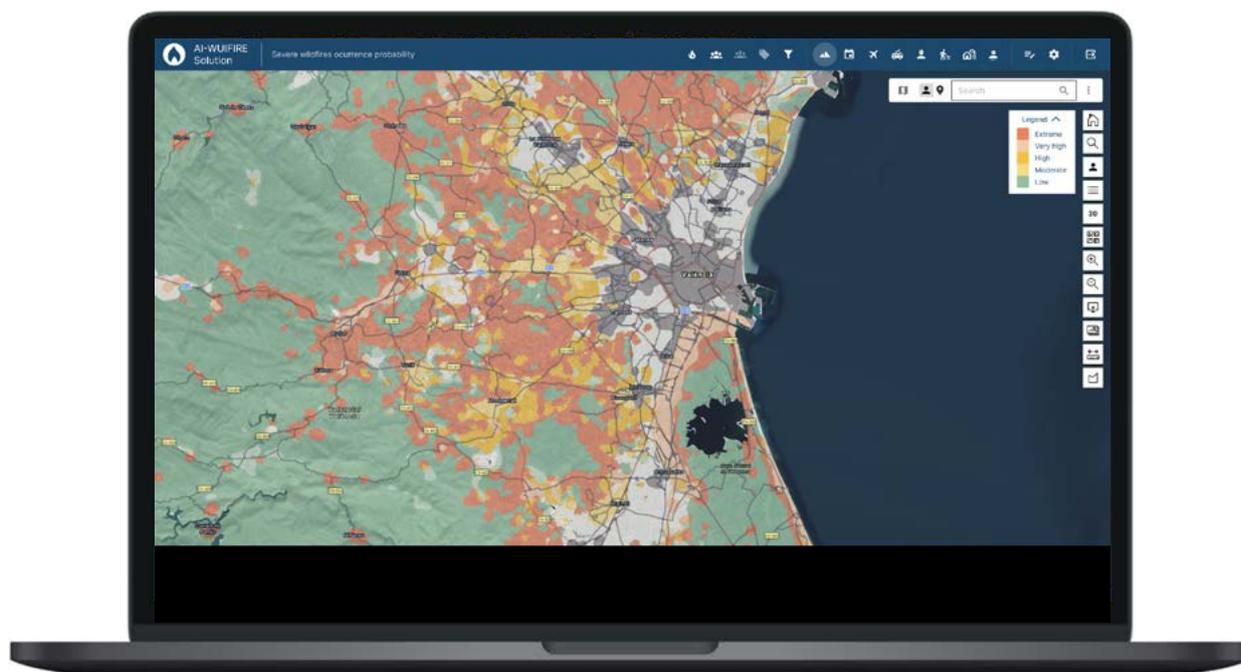
AI-WUIFIRE

Prevention of wildfire risks

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

AI-WUIFIRE helps reduce the severity and recurrence of wildfires impacting cities by enabling preventive measures well in advance in the highest-risk areas identified by the platform. This leads to significant environmental benefits, reduced damage to natural and urban areas, and strong social impact through improved protection of people and communities. Economically, it helps avoid losses by safeguarding homes, public spaces, critical infrastructure and municipal facilities.



END-USER / CUSTOMER PROFILE

Civil protection officers and emergency responders using the platform to prevent risks and manage live wildfire emergencies.



TYPE OF CITIES TARGETED

Cities with significant wildland–urban interface areas and surrounding vegetation, particularly vulnerable to wildfires.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

Requires basic geospatial data from cities, such as strategic assets (shelters, firefighting water points, roads etc).



KEY PERFORMANCE INDICATORS (KPIs)

Probability [0-1] and typology (crown, surface, intermittent) of wildfire successfully developing after ignition in WUI areas.

CHALLENGE ADDRESSED



Climate
resilience

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED



EUSPA MARKET SEGMENTS

- Emergency management and humanitarian aid
- Infrastructure

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Positioning data from emergency services (GPS / TETRA)
- Digital Twin
- 3D GIS
- SaaS platform

Innovativeness of the Solution

AI-WUIFIRE enables emergency responders to address wildfire events with potential impact on wildland–urban interface (WUI) areas across the full emergency cycle, from prevention to real-time response and post-event analysis. The solution introduces an innovative use of AI, based on models trained with Copernicus data and optional LiDAR, to generate continuously updated wildfire risk maps around WUI areas.

This AI-driven risk assessment is complemented by tools that add geographic context to emergencies, integrating city geospatial data such as critical infrastructure. All information is visualized together with additional GIS tools, such as a wildfire simulator that predicts fire evolution and supports informed decision-making regarding evacuation notices and the deployment of civil protection officers.

Consortium members



VEXIZA
(SPAIN)
VEXIZA.COM

Vexiza specializes in GIS solutions that simplify the management of extreme events such as wildfires. We help emergency managers quickly interpret large volumes of data across any emergency phase, through visual tools that leverage geospatial data to understand what is happening on the ground.

CHERISH

Protection of cultural heritage sites

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

CHERISH helps European cities monitor and manage risks affecting diverse infrastructure by leveraging Copernicus Earth Observation data and EGMS outputs. Integrated into an asset management platform, it combines EO-derived indicators with local asset data to support inspection prioritisation, preventive maintenance, and risk mitigation, reducing emergency interventions, costs, and environmental impact while improving urban resilience and public safety.



END-USER / CUSTOMER PROFILE

Municipal asset management, infrastructure, urban planning and resilience departments; organisations managing urban and religious assets.



TYPE OF CITIES TARGETED

European cities and regions seeking scalable, integrated solutions to manage, prioritise and plan across diverse infrastructure.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

Web-based SaaS platform with optional API integration; interoperable with existing GIS and asset management systems using standard geospatial data.



KEY PERFORMANCE INDICATORS (KPIs)

Asset exposure to ground motion, spatial extent of deformation, prioritisation indicators for inspections.

CHALLENGE ADDRESSED



Urban
planning and
management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED



EUSPA MARKET SEGMENTS

- Urban development and cultural heritage

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

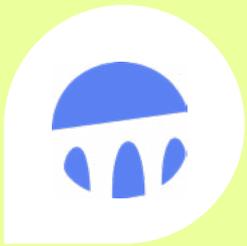
- Machine Learning
- Cybersec best practices
- Digital Twin
- 3D GIS
- SaaS platform

Innovativeness of the Solution

CHERISH introduces a new approach to ground-motion-based risk monitoring by embedding satellite analytics within a complete asset management solution. Unlike existing tools that mainly provide static maps of raw displacement values, CHERISH delivers interpretable indicators that help city teams understand where risks concentrate, how they evolve over time, and which assets require attention first.

Its innovativeness also lies in the robustness and transparency of its geospatial analytics, favouring explainable and statistically grounded methods over opaque, black-box AI. Beyond detection and maintenance, CHERISH supports asset prioritisation, planning, and decision workflows, enabling cities to move from isolated monitoring toward proactive, evidence-based asset management strategies.

Consortium members



**EONSIGHT
(FRANCE)
WWW.EONSIGHT.EU**

eOnsight is a European SME developing Earth Observation-driven platforms for monitoring and managing risks affecting infrastructure. The company has built recognised expertise in infrastructure monitoring, notably bridges, and is now expanding its scope to a broader range of city assets through the SPACE4Cities programme.

eOnsight focuses on transforming complex satellite data into interpretable, decision-ready indicators embedded within asset management workflows. Through web-based, interoperable solutions, it supports public authorities in moving beyond isolated monitoring tools toward integrated approaches combining risk detection, prioritisation, and planning. eOnsight is a Copernicus Masters laureate and an ESA BIC alumni, reflecting its recognised expertise in translating space technologies into operational public services.

CityMotion

AI agents for urban stability and infrastructure

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.





How the Solution Helps EU Cities and Regions

CityMotion supports cities in shifting from reactive infrastructure management to proactive, data-driven decision-making. By exploiting Copernicus Sentinel-1 deformation data at city scale, the solution provides continuous visibility on ground and structural movements affecting buildings, transport infrastructure, and public spaces.

From an operational perspective, CityMotion helps cities prioritise inspections and maintenance by identifying areas and assets exhibiting abnormal deformation trends, accelerations, or sudden behavioural changes. This reduces uncertainty, optimises field inspections, and enables early intervention before damage becomes critical.

At a strategic level, CityMotion integrates seamlessly with existing GIS and Digital Twin environments, allowing deformation indicators and structural health metrics to be combined with local dataset. AI-assisted interpretation supports city staff in understanding complex patterns and translating them into clear, actionable insights.

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

CityMotion contributes to climate resilience by enabling early detection of ground instability linked to subsidence, flooding, or climate-driven processes. Socially, it improves safety by reducing the risk of unexpected infrastructure failures. Economically, it supports more efficient allocation of maintenance budgets and reduces long-term repair costs through preventive action.



END-USER / CUSTOMER PROFILE

Municipal infrastructure, mobility, urban planning, resilience and civil protection departments.



TYPE OF CITIES TARGETED

Small, medium and large European cities, including metropolitan areas and regions with complex ground conditions.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

CityMotion integrates via APIs with existing GIS, Digital Twins and city data platforms; local data are optional (e.g. cadastral or asset datasets).



KEY PERFORMANCE INDICATORS (KPIs)

Percentage of urban area monitored, number of assets with structural health metrics, and detected deformation trends and alerts.

CHALLENGE ADDRESSED



Urban
planning and
management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED



EUSPA MARKET SEGMENTS

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



- Other European satellite mission: PAZ, TerraSAR-X, COSMO-SkyMed

OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Foundation Models (LLMs)
- Digital Twin
- SaaS platform

Innovativeness of the Solution

CityMotion goes beyond the current state of the art by addressing a critical bottleneck in the use of satellite-based deformation data: interpretability and operational usability at city scale. While services such as the European Ground Motion Service provide unprecedented access to deformation measurements, cities often lack the tools to translate these data into decisions.

CityMotion introduces a novel combination of large-scale InSAR analytics with AI-driven interpretation. Advanced algorithms automatically identify homogeneous behavioural zones, and detect trend changes linked to external drivers such as precipitation or temperature. These outputs are transformed into standardised structural health indicators directly linked to urban assets.

CityMotion is distinguished by its ability to perform systematic analysis of large-scale InSAR deformation datasets across entire urban environments, transforming massive volumes of satellite-derived measurements into consistent, city-wide intelligence and actionable metrics.

A key differentiator is AI-assisted and conversational interaction, enabling non-expert city staff to intuitively explore and interpret complex geospatial information using natural language. This radically lowers the barrier to adoption of Copernicus-based services and supports daily operational use by city staff.

CityMotion ensures full interoperability with GIS and Digital Twin ecosystems through standardised APIs and open data formats, and follows a provider-agnostic approach, avoiding dependency on specific InSAR processors and enabling flexible use of Copernicus or alternative data sources.

Consortium members



DETEKTIA
(SPAIN)
DETEKTIA.COM

Detektia is a specialised Earth Observation and AI company focused on large-scale monitoring of ground and infrastructure stability. With extensive experience in InSAR analytics, machine learning, and urban applications, Detektia develops advanced solutions that transform satellite data into actionable intelligence for cities, infrastructure managers, and public authorities across Europe and beyond.

CLIMAPS

Detection of heat islands, floods, and extreme weather events

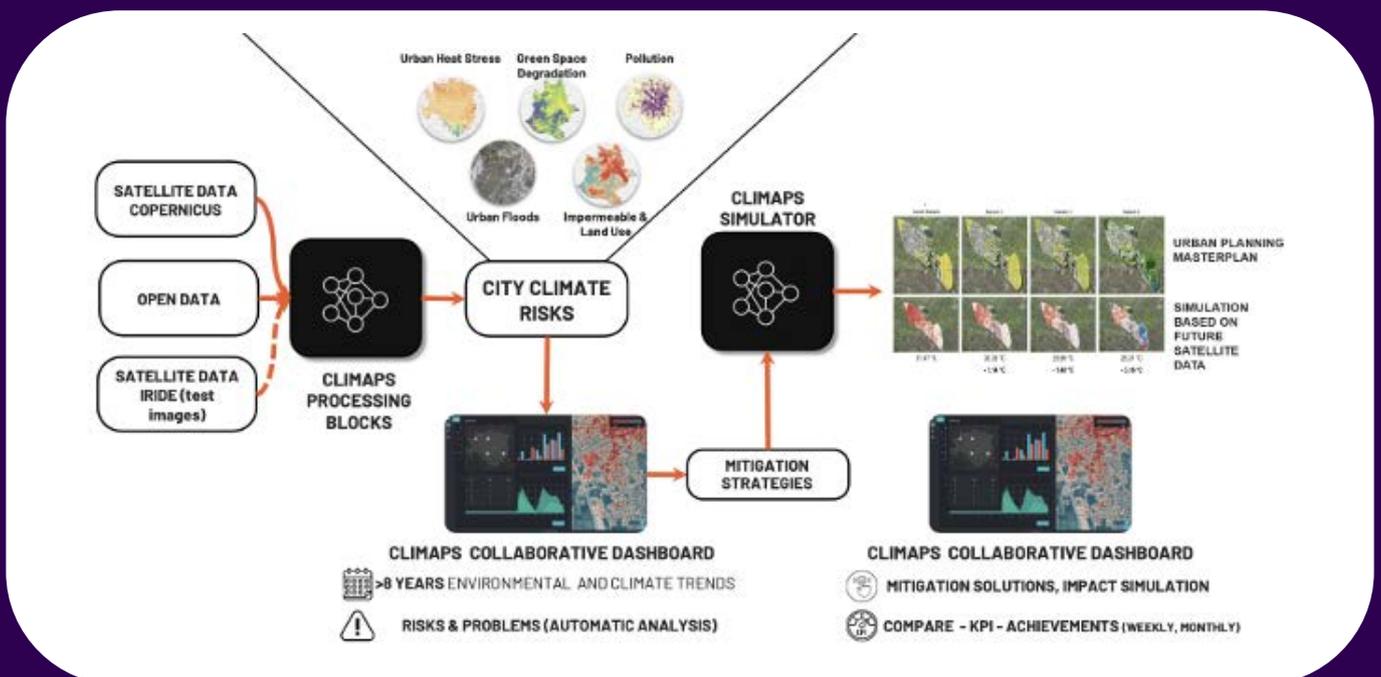


CLIMAPS is an innovative urban climate intelligence platform developed by the consortium led by Latitudo 40, with partners TeamDev and Planetek Italia.

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

CLIMAPS delivers quantifiable climate resilience outcomes for European cities. Environmentally, it enables data-driven nature-based solutions (tree planting, green roofs, permeable pavements) with verified heat-reduction impacts (LST improvements), flood risk mitigation, and biodiversity monitoring. Socially, it identifies heat-vulnerable communities, supports equitable resource allocation, and enables participatory climate planning through citizen-facing transparency dashboards. Economically, it accelerates time-to-decision (planning cycles reduced by 40%), lowers operational costs through optimized green-asset maintenance (-35-50% site visits), and quantifies ROI on climate investments before deployment, justifying municipal spending and attracting climate finance.



END-USER / CUSTOMER PROFILE

Urban planners, environmental engineers, GIS specialists, infrastructure managers, sustainability officers, emergency responders, and municipal policymakers across European cities seeking data-driven climate resilience solutions.



TYPE OF CITIES TARGETED

Mid-to-large European cities (100k-2M population) with existing digital infrastructure, climate ambitions aligned with EU Green Deal, and access to municipal datasets (cadastral, green assets, drainage networks). Initially: Helsinki, Amsterdam, Ghent, Athens, Guimarães (pilot cities).



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

CLIMAPS integrates seamlessly via open standards (FIWARE NGSI-LD, OGC APIs, STAC). Required local data: land-use cadastre, green-asset inventories, weather/air-quality station feeds, drainage networks. Three deployment tiers (no-touch, light-integration, foundational) deliver operational pilots in 10-30 days with minimal customization.



KEY PERFORMANCE INDICATORS (KPIs)

EarthDataInsights KPIs—examples: flood water depth & annual avg loss, SUHI area at risk, LULC patterns, vegetation/health variation by year, biodiversity habitat distribution by district. Municipalities analyze cities, prioritize actions, and target resilient interventions.

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



- Other national satellite mission: IRIDE

OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Computer Vision
- Natural Language Processing
- Blockchain
- Advanced Cybersecurity
- Cybersec best practices
- Connected Sensors
- Edge Computing
- LPWAN Networks
- Digital Twin
- Augmented/Virtual Reality
- 3D GIS
- SaaS platform

Innovativeness of the Solution

Technology Innovation: CLIMAPS fuses satellite Earth Observation with AI-powered environmental modelling and city IoT streams into a single, decision-ready platform. It operationalises Copernicus and delivers 10 metre resolution heat maps, vegetation health indices, and flood delineation at city scale.

Process Innovation – Geo-Simulator: The game-changer is the interactive geo-simulator: planners draw trees, different types of buildings, or cropland on a district map and instantly see climate outcomes. This shifts urban climate action from static risk maps to dynamic, testable intervention scenarios.

Use-Case Differentiation: CLIMAPS addresses the full urban climate lifecycle and delivers continuity across workflows. Integration with digital twins, emergency systems, and public dashboards ensures insights flow into operations.

Market Position: CLIMAPS is open-standards-native yet turnkey, combining scientific credibility with everyday usability for city teams who are not GIS specialists.

Consortium members



LATITUDO 40
(ITALY)
LATITUDO40.COM

Latitudo 40 develops Earth observation solutions that transform satellite data into climate insights. In CLIMAPS, it brings advanced AI and automation to monitor urban heat and flood risks, leveraging its mature EO infrastructure and proven European deployment experience.



TEAMDEV
(ITALY)
TEAMDEVECOSYSTEM.IT/EN

TeamDev has supported public authorities for over 15 years with advanced GIS tools for urban planning, emergency management, and environmental monitoring. As Esri Gold Partner, it develops custom web/desktop apps, spatial analysis, and ArcGIS-based systems. In CLIMAPS, TeamDev integrates the platform with city ecosystems and leads green infrastructure modelling.



PLANETEK ITALIA
(ITALY)
PLANETEK.IT

Planetek Italia develops geospatial solutions from satellite, aerial, and drone data for environmental monitoring, smart cities, open government, defense, infrastructure, and space missions. In CLIMAPS, it leads land use classification models to map urban impermeability, soil sealing, and spatial transformation patterns.

DYNAMO-SM

Traffic emission reductions

EVERIMPACT.AI combines satellite-based CO₂ 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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Everimpact supports EU cities and regions in turning climate commitments into measurable action by providing precise - every 10m, continuous - every hour, source allocated CO₂ emissions measurements. By combining sensor data with remote sensing insights and a state of the art foundational model, the solution enables evidence-based decisions, facilitates EU reporting and compliance needs, and helps prioritise investments with the highest welfare and climate impact. Dynamo-SM leads to faster emissions reductions, higher returns on public investments, and science based and transparent climate policies, while strengthening cooperation and trust between cities, stakeholders and citizens.



END-USER / CUSTOMER PROFILE

City climate, sustainability and air quality departments, private and public infrastructure operators, regional authorities managing emissions and climate reporting, local companies and financial institutions.



TYPE OF CITIES TARGETED

Worldwide cities and regions of all sizes, especially those managing complex infrastructure such as ports and mobility.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

Dynamo-SM can be deployed without integrating any local administration data, and is fully interoperable with existing infrastructures.



KEY PERFORMANCE INDICATORS (KPIs)

Verified continuous CO₂e emissions per urban asset (buildings, infrastructure, zones) to track reductions and climate action impact.

CHALLENGE ADDRESSED



Sustainable
mobility

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED



EUSPA MARKET SEGMENTS

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



- Other national satellite mission: OCO-2; OCO-3; GOSAT

OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Deep Learning
- Computer Vision
- Connected Sensors
- Edge Computing
- LPWAN Networks
- Blockchain
- Advanced Cybersecurity
- Cybersec by design & User Management System
- Digital Twin
- Augmented/Virtual Reality
- 3D GIS
- 10m near-real-time CO₂ Emissions map
- Computational Fluid Dynamics (CFD) Models, Remote Sensing

Innovativeness of the Solution

Everimpact delivers a space-enabled, AI first solution that enables European cities to move from estimated to measured and verifiable greenhouse gas emissions at asset and infrastructure level. The solution combines ground-based sensors, satellite data, and AI-based CFD modelling to provide continuous, auditable CO₂e monitoring aligned with EU climate objectives. Emissions are allocated to specific emitters with 10m precision and classified by sector and subsector (industrial, residential, traffic highways, LEZs, green areas). Unlike traditional inventory-based tools, Dynamo-SM enables near-real-time monitoring to assess the impact of climate actions. Its interoperable, scalable platform integrates with existing urban data systems and supports replication across European cities, including within SPACE4Cities.

Consortium members



EVERIMPACT
(FRANCE)
EVERIMPACT.COM

Everimpact is a climate technology company specialising in independent, real-time measurement of greenhouse gas emissions. Using a unique combination of satellite data, ground-based sensors, and AI-driven analytics, Everimpact provides continuous, accurate, and location-specific emissions data to cities, ports, vessels, and financial institutions (e.g. PostFinance). Its solutions enable transparent monitoring, reporting, and reduction of carbon emissions, supporting regulatory compliance and informed decision-making. Everimpact's technology bridges the gap between climate commitments and real-world impact by delivering trusted, actionable emissions intelligence at scale.

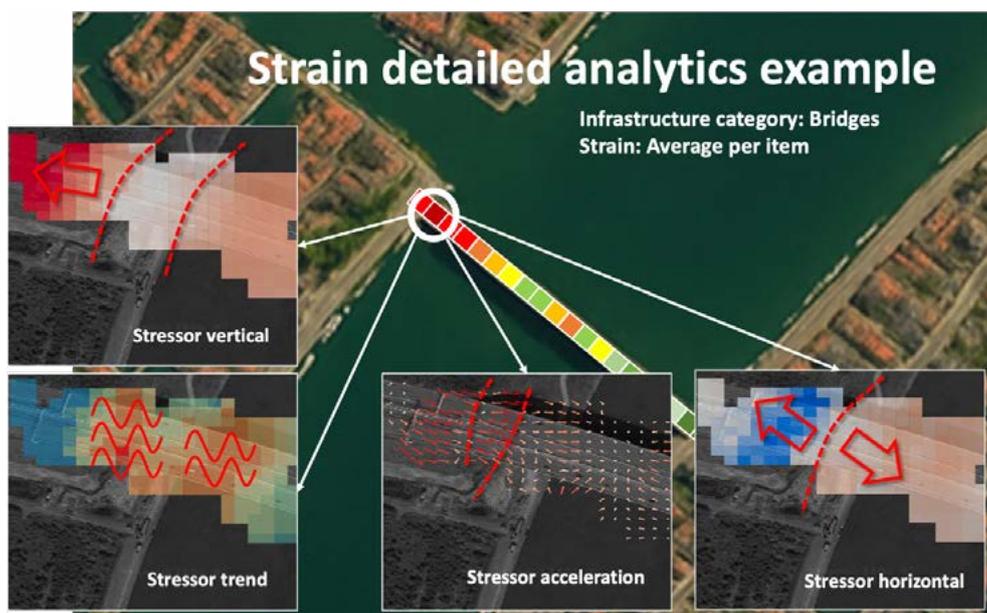
GeoRisk Monitor

Monitoring of the condition of bridges, roads, and railways

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

GeoRisk Monitor helps cities cut costs and reduce risk with proactive, infrastructure management. Emergency repairs, unplanned closures, and infrastructure failures can turn out very costly. GeoRisk Monitor enables predictive maintenance, supports climate-resilient infrastructure planning, contributes to safer mobility and reduces public disruptions. We turn satellite data into clear risk indicators to extend the lifespan of bridges, roads, railways, tunnels, levees, quay walls, and buildings.



END-USER / CUSTOMER PROFILE

City staff involved in infrastructure monitoring or maintenance, such as inspection, planning, risk, or engineering roles.



TYPE OF CITIES TARGETED

European cities dealing with aging infrastructure, or ground instability due climate change or building activities.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

GeoRisk Monitor integrates seamlessly into cities' digital workflows and infrastructure through its API-first architecture.



KEY PERFORMANCE INDICATORS (KPIs)

Fewer unplanned closures, reduced downtime, higher inspection efficiency, better alignment of forecasted vs actual spend.

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



- Other European satellite mission: TerraSAR-X, COSMO-SkyMed, PAZ

OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Deep Learning
- Digital Twin
- 3D GIS
- SaaS platform

Innovativeness of the Solution

GeoRisk Monitor goes beyond showing where the ground moves by revealing where that movement becomes dangerous. It translates surface motion into stress and strain, direct precursors to structural damage, so risks are identified based on engineering relevance, not raw displacement. By focusing on strain instead of movement alone, it significantly reduces false alarms and highlights what truly matters for asset safety. GeoRisk Monitor also shows how strain builds up from different stressors, providing insight into underlying causes rather than just symptoms. Using Copernicus EGMS satellite data, the platform delivers high-resolution, true 3D information with increased accuracy and precision. Designed to scale, it can be efficiently deployed across any European city.

Consortium members



Survintel is a leading expert in the analysis of ground deformation based on satellite data, translating InSAR data into relevant risk indicators for infrastructure monitoring. They develop geoscientific models based on 25+ years of experience in the energy sector.

SURVINTEL
(NETHERLANDS)
SURVINTEL.COM



Gisaïa is a provider of geospatial data platforms and analytics, and the creator of ARLAS geo-analytics engine. They specialise in turning complex geospatial data into scalable, user-friendly applications.

GISAÏA
(FRANCE)
GISAIA.COM

OptimGreen

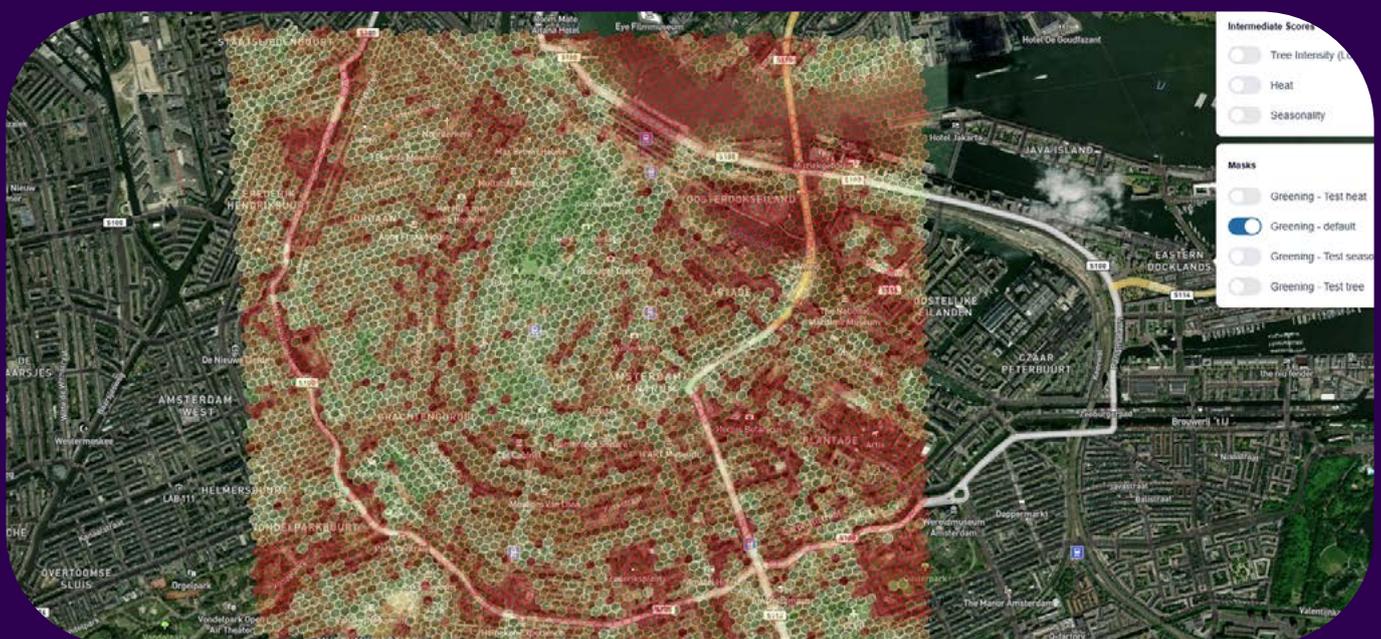
Strategic planning of urban green spaces

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Environmentally, the solution enables climate-resilient urban greening by reducing heat stress, flood exposure and soil-related infrastructure damage through evidence-based planning. Socially, it improves citizen well-being via safer, better-targeted green spaces and more transparent decision-making. Economically, it reduces avoidable maintenance costs, accelerates planning cycles, and supports scalable, cost-efficient adoption across European cities using Copernicus data.



END-USER / CUSTOMER PROFILE

Municipal urban planners, GIS teams, and technical services managing greening, infrastructure risk, and climate adaptation.



TYPE OF CITIES TARGETED

European cities of any size, replicable across regions using Copernicus-based, standardized and interoperable data.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

Integrates with existing city GIS; runs on Copernicus data alone, with optional local data (e.g. tree maps).



KEY PERFORMANCE INDICATORS (KPIs)

Greening suitability score per area, classifying zones as suitable, to reinforce, or to avoid for new planting.

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Deep Learning
- Digital Twin
- 3D GIS
- SaaS platform

Innovativeness of the Solution

OPTIM-Green goes beyond the state of the art by transforming complex Earth Observation data into a single, operational decision tool for urban greening.

Unlike existing solutions that focus only on vegetation or cooling benefits, OPTIM-Green uniquely integrates seasonal InSAR ground-motion analysis with heat, flood and land-use indicators to assess both the benefits and risks of greening.

The innovative use of Sentinel-1 seasonality allows detection of soil shrink–swell dynamics that are usually ignored in urban planning tools but are critical to avoid infrastructure damage.

By fusing these multi-risk signals into a standardized Greening Suitability Score (“suitable / reinforce / avoid”), the solution bridges the gap between advanced satellite analytics and everyday municipal workflows.

Built on open standards and Copernicus data, it is scalable, interoperable, explainable, and easily replicable across European cities, creating a new category of evidence-based, infrastructure-aware climate adaptation services.

Consortium members

OPTIM.AIZE
(FRANCE)
OPTIMAIZE.FR



Optim.Aize is a geoscience and AI company that transforms Earth Observation data into clear, decision-ready insights for infrastructure owners, cities, and insurers. We combine satellite data, geospatial science, and advanced analytics to produce dynamic maps that make complex ground and climate phenomena understandable and actionable.

We are engineers and scientists at core. Our approach is pragmatic: start from the user's operational question, translate it into measurable physical indicators, and deliver results in a format that fits existing workflows. Optim.Aize supports both strategic planning and operational monitoring, enabling clients to anticipate risks, track change over time, and make informed, defensible decisions in a changing environment.

URBAN-LENS

Tracing of underground pipe leaks

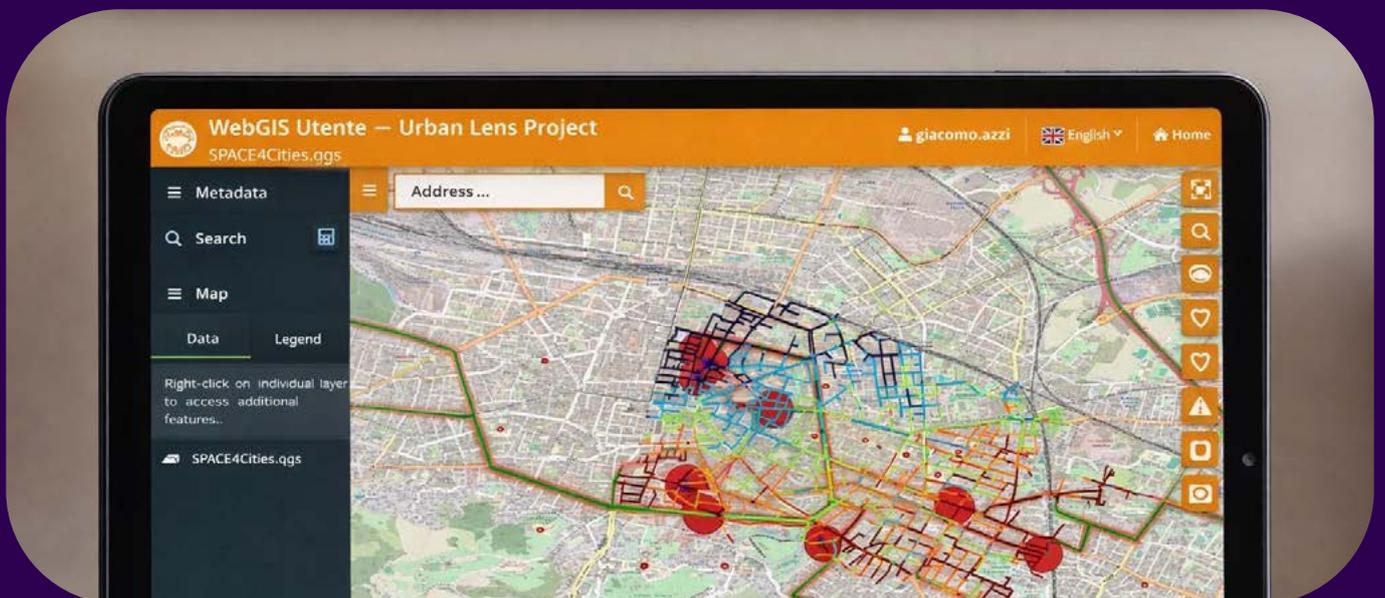


URBAN-LENS (URBAn Analytics with Layered Earth observation and Navigation Signals) is an innovative system developed by Neptune Srl and Cosmic Srl for monitoring water leaks in urban networks.

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Urban Lens helps cities address the challenge of non-revenue water by enabling earlier identification of potential leak areas and supporting better prioritisation of inspections. The solution contributes to more efficient use of resources and improved management of urban water infrastructure.

Reducing water losses lowers the environmental impact associated with water extraction, treatment, and distribution. Socially, earlier detection of leaks helps reduce service disruptions, emergency repairs, and inconvenience for citizens. Economically, improved prioritisation of inspections and interventions can lead to lower repair costs, reduced damage to infrastructure, and more efficient allocation of operational budgets.



END-USER / CUSTOMER PROFILE

Water utilities, municipal water departments, and city infrastructure managers. It is particularly relevant for cities with ageing water infrastructure, where hidden leaks can remain undetected for long periods of time.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

The solution is vehicle-based and does not require permanent installations or significant modifications to existing infrastructure.



KEY PERFORMANCE INDICATORS (KPIs)

Detection accuracy in urban environments, reduction of false positives, coverage achieved during vehicle surveys, and the level of support provided for prioritising inspection and intervention activities.

CHALLENGE ADDRESSED



Urban
planning and
management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED



EUSPA MARKET SEGMENTS

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Connected Sensors
- Cybersec best practices
- SaaS platform

Innovativeness of the Solution

The innovativeness of Urban Lens lies in its ability to combine space-derived data with GNSS-Reflectometry measurements collected during normal vehicle operations, transforming these inputs into operationally meaningful information for water leak detection and prioritisation. Unlike traditional approaches, which are often local, reactive, and resource-intensive, Urban Lens supports a broader and more systematic monitoring perspective that can be applied at city scale.

A key innovative aspect is the operational use of GNSS-Reflectometry in dense urban environments, where signal conditions are complex and highly variable. Rather than treating these conditions as a limitation, Urban Lens addresses them through a modular processing architecture and a strong emphasis on quality control, signal conditioning, and robustness. This enables reliable performance under non-ideal, real-world conditions.

Innovation in Urban Lens is not limited to sensing technology alone. The solution adopts an integrated, service-oriented design that bridges the gap between research and operational use. Transparency, explainability, and adaptability are core principles, allowing the system to avoid black-box behaviour and to support validation, maintenance, and long-term adoption by public operators.

Overall, Urban Lens represents an innovative approach that translates advanced space-based technologies into practical tools for urban water infrastructure management, focusing on operational value, scalability, and real-world applicability.

Consortium members

Neptune and Cosmic are two Italian companies specialised in innovative water loss detection and space-derived environmental monitoring solutions.

Together, they combine operational expertise in water network management with advanced space-based data processing capabilities. They work with utilities and public operators across Europe to support more resilient, efficient, and sustainable water infrastructure management, helping translate technological innovation into practical, operational tools for real-world use.



**NEPTUNE
(ITALY)
NEPTUNEWATERLEAKS.COM**



**COSMIC
(ITALY)
COSMICWATERLEAKS.SPACE**

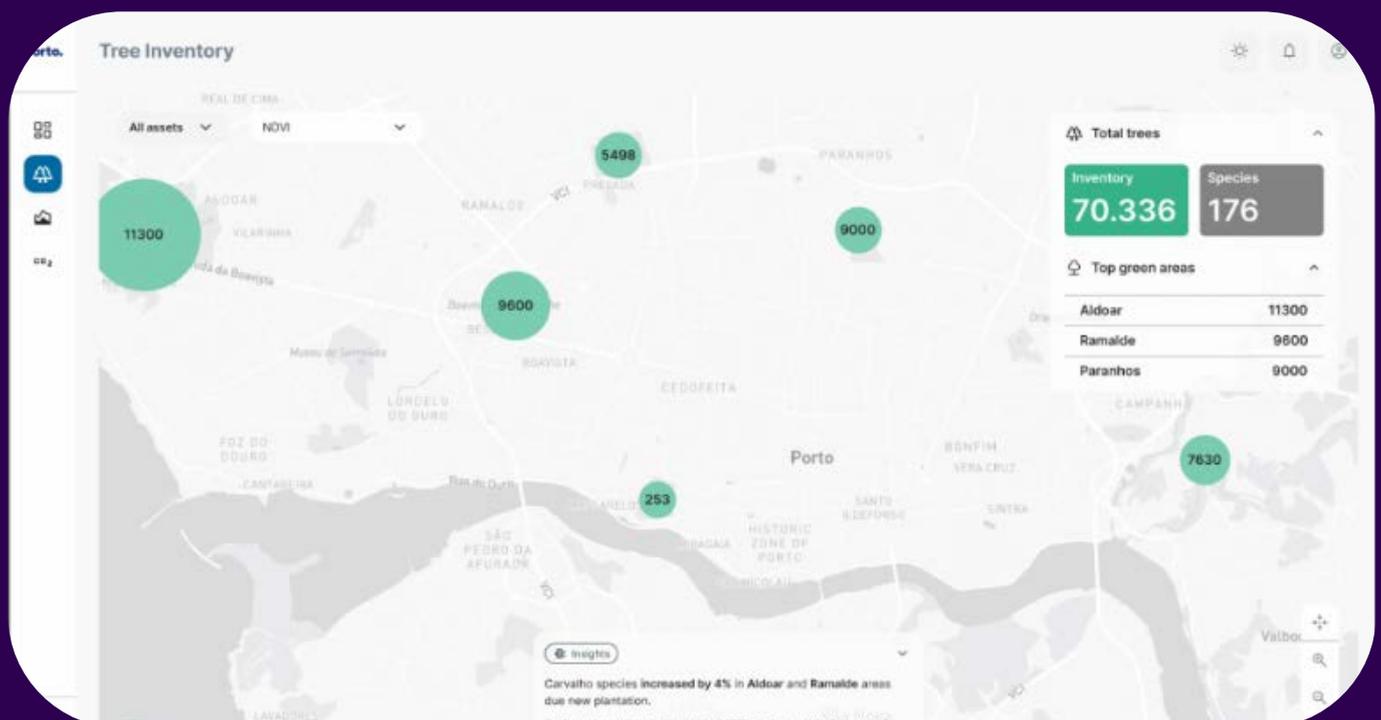
UrbanROOTS

Monitoring the condition and changes of green spaces

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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

Enables cities to continuously monitor and maintain green spaces, quantify carbon sequestration, and advance climate resilience goals. Provides healthier urban environments through transparent, data-driven planning and enforcement. Reduces monitoring costs, accelerates response to land-use change, and allows for smarter, focused investment in green infrastructure, delivering tangible environmental, social, and economic value.



END-USER / CUSTOMER PROFILE

Municipal urban planners, environment and sustainability departments, parks and green-area managers, and smart city teams.



TYPE OF CITIES TARGETED

European cities of any size with climate ambitions and digital maturity, seeking scalable, satellite-based monitoring of green infrastructure and land-use change.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

Plug-in integration via OGC APIs; uses existing GIS, zoning maps, tree inventories and optional LiDAR or local datasets.



KEY PERFORMANCE INDICATORS (KPIs)

Green-area change (ha and %), tree count and distribution (trees/ha), carbon sequestration (tCO₂e), zoning compliance events (count, area and persistence), update frequency (weekly/monthly monitoring).

CHALLENGE ADDRESSED



Urban
planning and
management

SUSTAINABLE DEVELOPMENT GOALS ADDRESSED



EUSPA MARKET SEGMENTS

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



- Other national satellite mission: Atlantic Constellation (PT Contribution)

OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Deep Learning
- Computer Vision
- Cybersec best practices
- SaaS platform

Innovativeness of the Solution

UrbanROOTS advances Earth Observation for cities by moving beyond static monitoring to deliver continuous, policy-ready urban intelligence that supports planning, compliance, and climate action.

UrbanROOTS uniquely integrates Copernicus Sentinel-1 and Sentinel-2 data with very high-resolution imagery and optional LiDAR into a single, automated processing pipeline, delivering urban-scale insights that single-sensor or inventory-based solutions cannot achieve. City-specific, explainable AI models adapt land-use classification, tree detection, and carbon estimation to local morphology, climate conditions, and planning rules, enabling consistent yet locally relevant analytics across European cities.

Unlike solutions focused on mapping or visualisation, UrbanROOTS directly connects EO outputs to zoning regulations, climate targets, and sustainability KPIs, enabling automated compliance checks, carbon accounting, and resilience analysis within operational workflows. Built as a modular, cloud-native, multi-tenant SaaS platform, the solution is interoperable by design, exposing outputs through OGC APIs, STAC catalogues, and alignment with OASC MIMs. This ensures seamless integration with municipal GIS, digital twins, and smart-city platforms, while supporting rapid replication across cities of different sizes and digital maturity.

Consortium members



CEiIA
(PORTUGAL)
WWW.CEiIA.COM

CEiIA is a Centre for Engineering and Product Development that designs, develops, and industrializes technologies, products, and services for a more sustainable society. Through its Space Digital team, CEiIA bridges space and digital tech, delivering downstream services, and AI-driven solutions.

VISTA

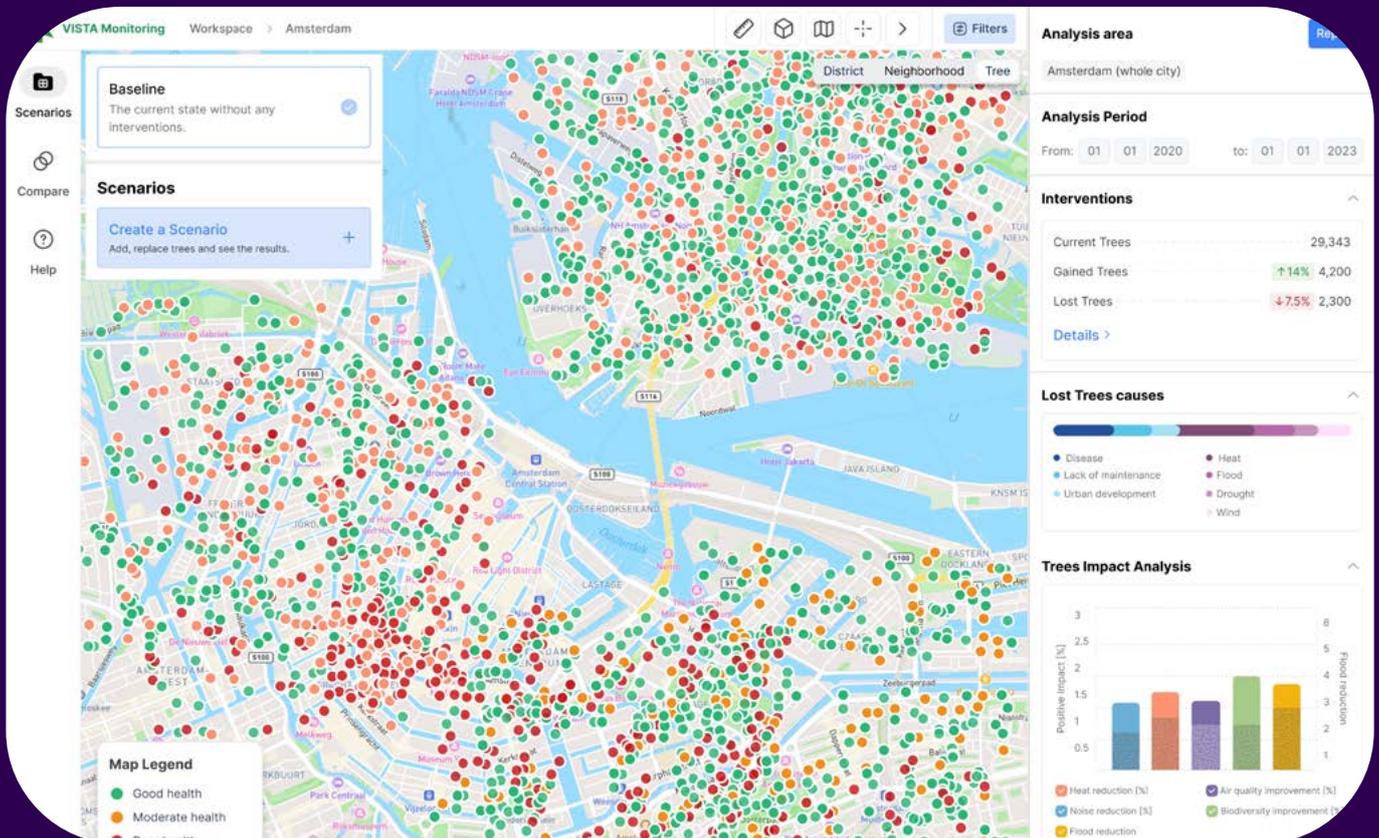
Management of green areas and biodiversity



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.





How the Solution Helps EU Cities and Regions

EXPECTED ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACTS

VISTA enables cities to shift from reactive to predictive urban green infrastructure management using satellite-IoT data fusion. Environmental: up to 2°C urban heat island reduction in pilot districts, improved air quality and carbon sequestration. Social: better access to healthy green spaces for citizens, enhanced climate resilience for vulnerable populations. Economic: ≥10% maintenance cost reduction within 2 years, ≥25% fewer premature tree replacements, and quantified ecosystem service benefits (e.g. avoided flood damage) to justify continued municipal investment in nature-based solutions.



END-USER / CUSTOMER PROFILE

City environmental officers, urban planners, climate adaptation managers, and maintenance departments of EU municipalities.



TYPE OF CITIES TARGETED

Mid-to-large European cities (≥200k inhabitants) with >500 ha managed green areas; scalable to capitals and metro regions.



EASE OF IMPLEMENTATION / INTEGRATION WITH EXISTING SYSTEMS

Cloud-native SaaS; cities upload tree inventories (CSV/GeoJSON). Integrates with municipal GIS, digital twins via OGC APIs



KEY PERFORMANCE INDICATORS (KPIs)

Vegetation health index, maintenance cost savings (%), tree survival rate, urban heat reduction (°C), ecosystem service value (€).

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

EU SPACE DATA AND SERVICES USED IN THE SOLUTION



- Other national satellite mission: Landsat 8/9 (temporal gap-filling and long-term trend analysis via Sentinel-Landsat fusion)

OTHER KEY TECHNOLOGIES INTEGRATED INTO THE SOLUTION

- Machine Learning
- Deep Learning
- Computer Vision
- Connected Sensors
- LPWAN Networks
- Digital Twin
- 3D GIS
- SaaS platform

Innovativeness of the Solution

VISTA is the first integrated platform combining Copernicus satellite data, IoT tree sensors (TreeSense), and localized climate forecasting (ClimateScale) into a single urban green infrastructure lifecycle tool. Key differentiators: (1) Urban-optimized data fusion achieves tree-level health insights at city scale—resolving the resolution-cost paradox where existing tools are either too coarse or too expensive. (2) Predictive intelligence: ML models trained on 40+ years of climate baselines deliver proactive maintenance alerts and climate scenario planning, replacing reactive approaches. (3) Cross-departmental collaboration: role-based dashboards serve planning, maintenance, and climate teams from one shared platform, eliminating data silos. (4) Automated impact quantification: translates complex EO data into budget-ready metrics for political reporting and funding justification. Modular SaaS architecture lets cities adopt components independently.

Consortium members



Bitagreen (Lead Supplier) specializes in geospatial tools for nature-based urban resilience. In SPACE4Cities, Bitagreen leads platform architecture, system integration, user interface design, overall coordination and oversees engagement with cities. Bitagreen enables cities to enhance climate resilience while optimizing investments and operational expenditures for green spaces.

BITAGREEN
(BELGIUM)
BITAGREEN.IO



Climate Scale contributes its expertise in high-resolution, downscaled climate modelling and localized climate risk forecasting. It provides the platform with predictive climate data tailored to the urban scale—enabling anticipatory planning for heatwaves, drought, and other stressors affecting urban green infrastructure.

CLIMATE SCALE
(SPAIN)
CLIMATESCALE.COM



TreeSense brings in operational know-how and proven technology for real-time tree and vegetation health monitoring. Its sensor-based monitoring infrastructure provides continuous data on tree water needs, stress levels, and growth trends. TreeSense also plays a central role in validating ground-truth observations and supporting maintenance use cases.

TREESENSE
(GERMANY)
TREESENSE.NET

The most urban-relevant Copernicus Sentinels



A mission composed of two satellites operated by 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 estimate 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 sea-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's 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>.

