



CITY SCAPE



OVERVIEW

The application offered through this use case enables urban stakeholders to access, share, and analyse diverse datasets related to energy consumption, mobility, environmental conditions, and citizen behaviour. By integrating these datasets into federated dataspace, Transilvania IT Cluster facilitates real-time insights, predictive analytics, and policy modeling tools that are critical for climate-smart governance, sustainable public service delivery, and stakeholder engagement.

CHALLENGE

Creating smarter, more sustainable cities by developing and operating interoperable dataspace that support data-driven decision-making.

PURPOSE

This use case focuses on enabling climate-neutral urban development in Cluj-Napoca, Romania by integrating and orchestrating cross-sectoral datasets within two interoperable dataspace: the City Dataspace and the ZERONET Dataspace. The scope includes real-time data exchange, monitoring, analytics, and policy support in areas such as energy consumption, traffic, public transport, environmental quality, and citizen engagement.

The primary goal is to provide a federated data infrastructure that supports data-driven decision-making for city authorities, researchers, service providers, and citizens. This infrastructure empowers stakeholders to collaboratively design, implement, and validate strategies aimed at reducing greenhouse gas emissions, improving energy efficiency, and enhancing public services in line with Net Zero City ambitions.



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OFFERED SERVICES

A set of digital tools that enable real-time monitoring and decision support for urban sustainability goals. These services are critical for advancing Cluj-Napoca's Net Zero ambitions by supporting evidence-based planning in mobility, energy, waste, and public service delivery. The services are implemented as modular web applications, data dashboards, integrated within the City Dataspace and ZERONET Dataspace, which is developed and operated by Transilvania IT Cluster.

Key services include:

- Anonymized and trusted data exchange through Intersector Dataspace (IDS) -compliant connectors
- Support for digital twin scenarios (e.g., residential buildings under Nearly-Zero Energy Building standards)
- Visualization and dashboard tools for public and institutional users

DATASPACES

Two dataspace, ZERONET Dataspace and City Dataspace, have been set up for integration into the City Scape use case. One represents the macro-city data flows around net-zero ambitions of the city, and the other represents a more micro perspective at the level of residential buildings.

NON-FUNCTIONAL PROPERTIES

- **Scalability:** Modular architecture enables expansion to other cities or domains.
- **Security:** Data is exchanged via IDS-compliant connectors with policy-based access control.
- **Trust & Compliance:** Transparent governance with dataset-specific terms and user agreement enforcement.
- **Reliability:** Deployed on robust cloud infrastructure.
- **User-Centricity:** Designed to accommodate.

FUNCTIONAL PROPERTIES

- Real-time data acquisition and sharing across sectors (mobility, energy, environment).
- Semantic interoperability for structured, machine-readable datasets.
- Support for digital twin simulations (e.g., Net Zero buildings).
- Privacy-preserving access control and data anonymization.
- Visualization dashboards for institutional and public use.



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MODULES USED IN THIS USE CASE



DS2 Sovereignty Decision Support

Added Value: The municipality and other members will evaluate sovereignty risks and generate risk profiles before sharing data, enhancing trust in cross-sector data exchange.



DS2 Policy Agreement & Enforcement

Added Value: Data access rules are automatically enforced on every transaction, ensuring usage policies are respected without manual intervention.



DS2 Data Share Controller

Added Value: Members will see analytics and have control over data sharing.



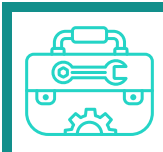
DS2 DARC

Added Value: New members will be able to use an AI chatbot to discover DS2 capabilities, find datasets, and get guidance on which modules to use.



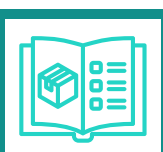
DS2 Portal

Added Value: Organisations and researchers will be able to register, manage their dataspace participation, and access all DS2 modules through a single entry point.



DS2 IDT Integrated Broker, Modules & Toolkit

Added Value: CityScope members will be able to connect to other dataspaces through a scalable, secure networking backbone that enables all other DS2 modules to run.



DS2 Catalog

Added Value: Researchers will search for data products related to climate and transportation.



DS2 Data Inspection

Added Value: The municipality and other members will anonymise data prior to its consumption.



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MODULES USED IN THIS USE CASE



DS2 Orchestration

Added Value: The municipality will be able to automate multi-step data workflows, coordinating collection, processing, and routing of data from multiple city sources.



DS2 DRM

Added Value: The municipality will be able to track data exchanges in an auditable manner.



DS2 Data Retrieval

Added Value: Members will be able to access data from city sources without technical knowledge, using AI to compose and deliver the correct data request automatically.



DS2 Identity

Added Value: Only verified organisations will be able to access and share data within CityScape.



DS2 Culture and Language

Added Value: CityScape members will be able to interact with the dataspace and discover datasets in Romanian.



DS2 Policy Creation

Added Value: Dataspace administrators will be able to create and manage data access policies using a simple, guided interface.



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COMPLEX DATA LIFECYCLE AND REGULATORY COMPLIANCE TESTING

City Scape presents public-private data-sharing challenges with citizen consent management in municipal contexts.

BEFORE & AFTER DS2

Before DS2: Critical urban data was locked in isolated public and private silos, preventing decision-makers from gaining the insights needed to effectively tackle city-wide greenhouse gas emissions.

After DS2: Stakeholders collaborate through a secure, interoperable ecosystem that integrates city-wide and residential data, empowering them with real-time analytics to actively drive the city toward climate neutrality.

USE CASE PARTICIPANTS



www.dataspace2.eu/city-scape



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101135967.