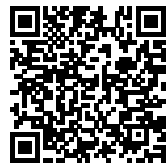


Visualising human life in
volumetric cities
Gillian Rose

UTRECHT'S DIGITAL TWIN: ADVANCING DATA-DRIVEN URBAN PLANNING

Posted on December 18, 2025 by gaiapilia

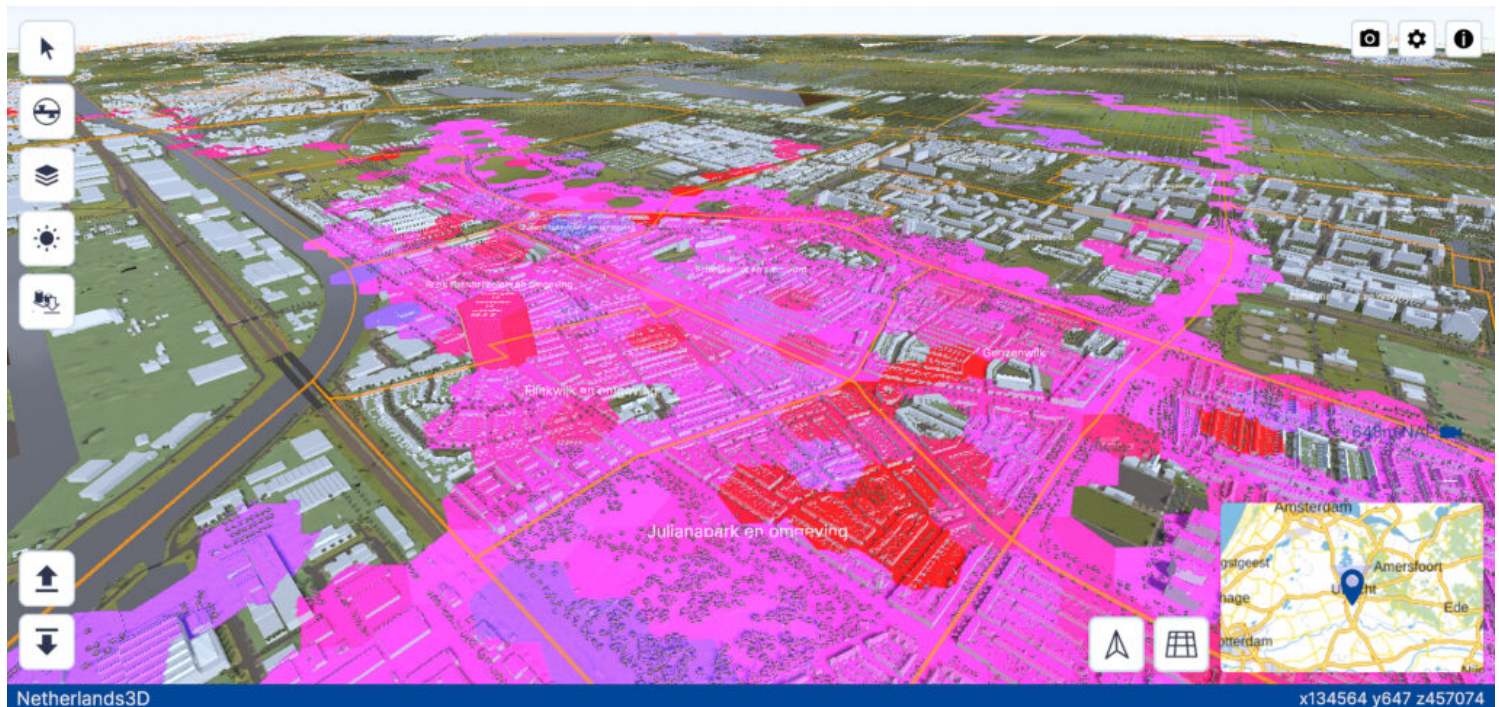


Categories: [Energy and sustainability](#), [Project](#), [Technology and fabrication](#), [Territory and mobility](#), [Urban ReLeaf](#)

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What if city planners could test urban design scenarios before breaking ground?

Utrecht's Digital Twin is making this a reality, as we discovered at the Urban ReLeaf General Assembly in Cascais.



Digital Twin of the city of Utrecht

What is Utrecht's Digital Twin?

The Utrecht Digital Twin is an interactive 3D model that captures everything from buildings and parks to underground infrastructure. It's a living data platform where city officials, researchers, and residents are collaborating to visualise changes and assess environmental impacts before implementation.

Annemarie Derksen, team manager of Urban Design at the Municipality of Utrecht, explains,

"The digital twin is a great tool to dive into the DNA of your city and see the impact of your

plans in advance".



Utrecht Urban Planning and Development

Built Through Collaboration

This innovation emerges from a powerful partnership network:

- **Municipality of Utrecht** – Leading the initiative to improve urban planning, sustainability, and infrastructure management, in collaboration with Amsterdam and the provinces of Flevoland and Utrecht.
- **Knowledge institutions** – Delft University of Technology and the Dutch Cadastre, Land Registry, and Mapping Agency contribute expertise in digital modelling and urban analysis.
- **Private sector & technology companies** – Engineering firms and game developers like Unity provide technical support and infrastructure solutions.

urbanNext Lexicon

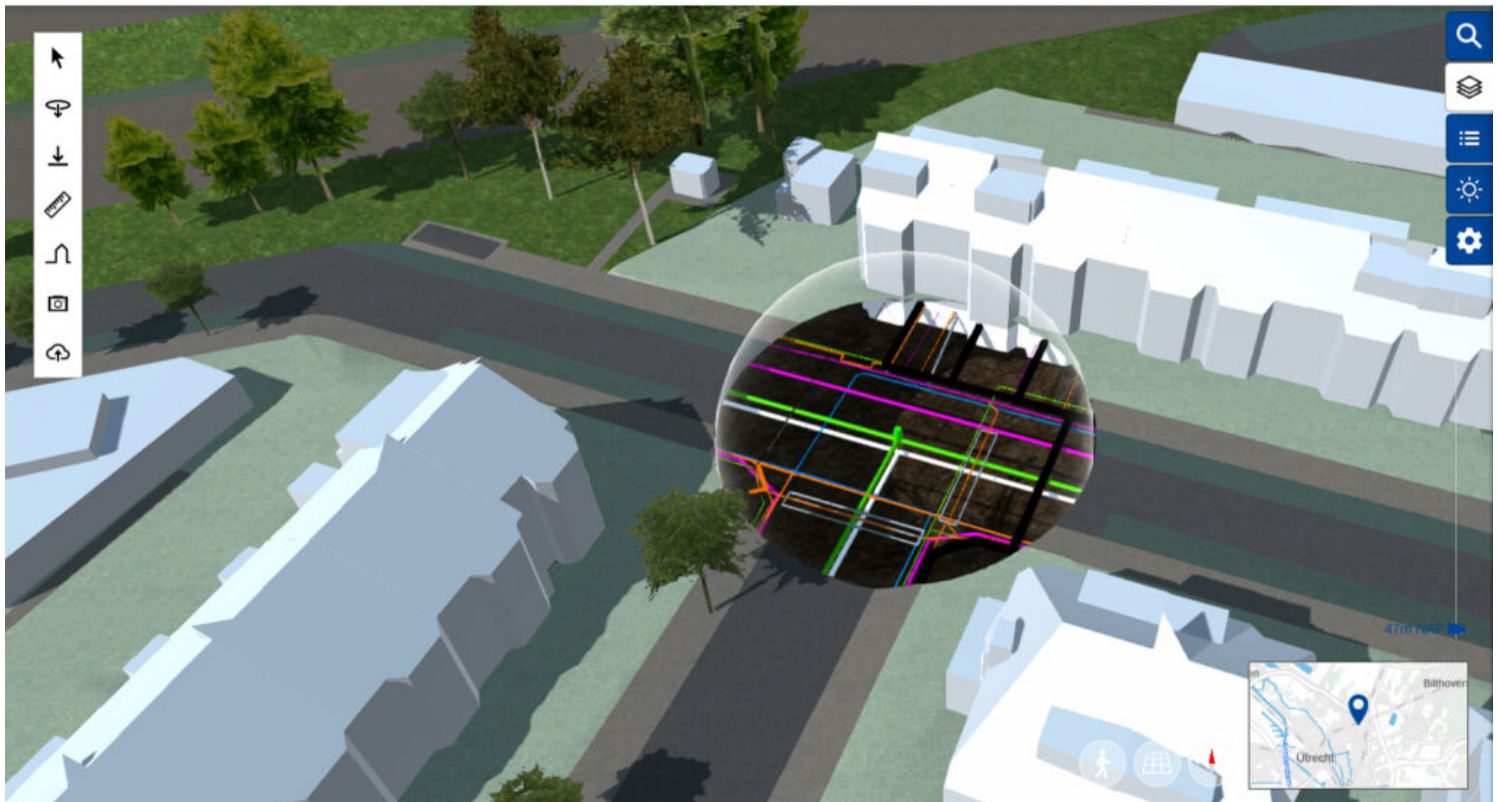
Utrecht's Digital Twin: Advancing Data-Driven Urban Planning

<https://urbannext.net/utrechts-digital-twin-advancing-data-driven-urban-planning/>

- **Local communities & residents** – As part of the Urban ReLeaf project, residents from four neighbourhoods have contributed climate data, helping to map temperature variations, humidity levels, and heat hotspots.



3D Utrecht



Utrecht digital twin showing underground infrastructure

Real world benefits

Originally designed for urban planning, the Digital Twin now delivers:

- **30% faster** decision-making on infrastructure projects
- **Visualisation of 12 climate adaptation scenarios** for heat island mitigation

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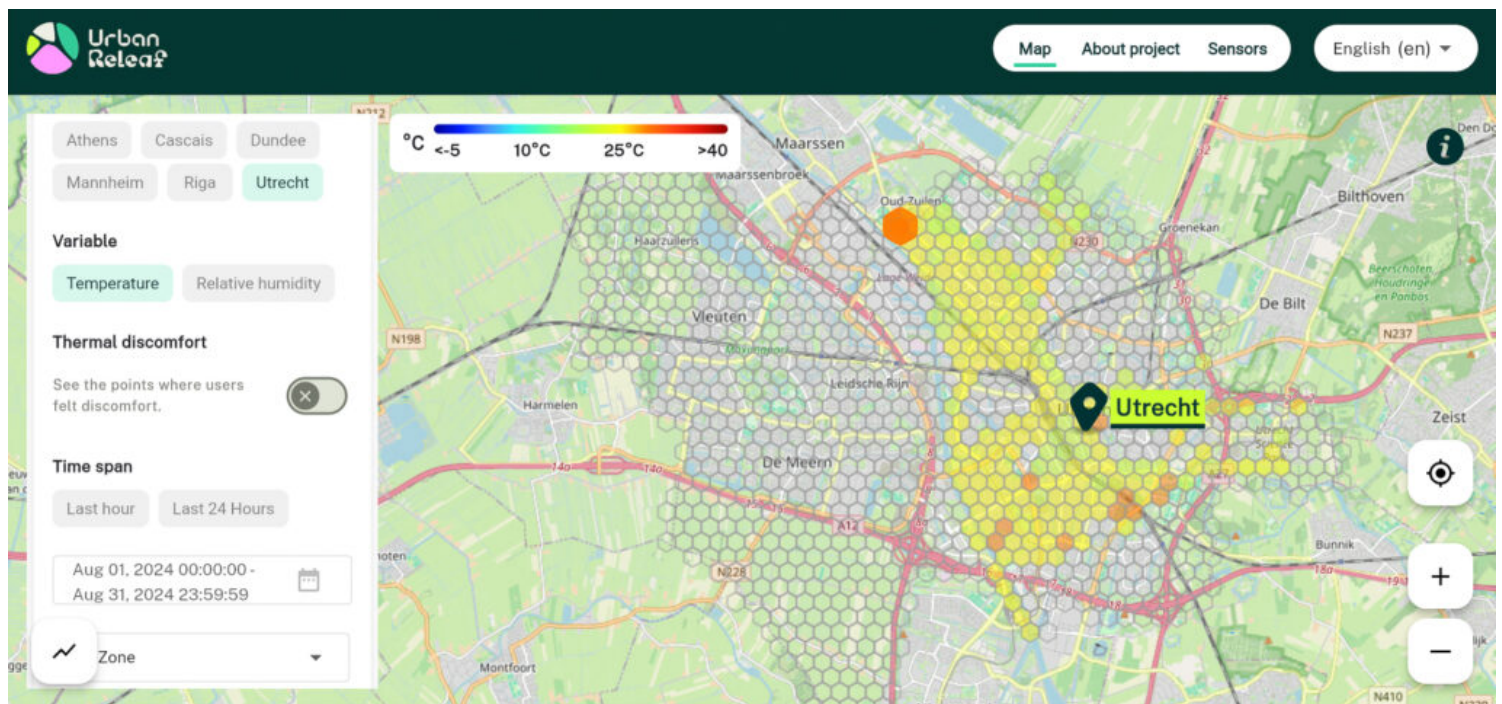
- **Engagement from over 200 community members** contributing localised data

The platform bridges the reality of above and below-ground infrastructure, connecting underground utilities with surface development plans, a challenge that previously created costly planning delays.

From Data to Action

Utrecht has already integrated the Digital Twin into several projects. The neighbourhood climate data collected through Urban ReLeaf appears directly in the model, creating Utrecht's first comprehensive heat map and climate adaptation planning. Additionally, the model connects above ground plans with below ground constraints by linking 3D underground data with urban development. This isn't just data collection, it's informing where the city plants trees, installs cooling infrastructure, and prioritising green space development.

The Twin4Resilience initiative is also enhancing the skills of urban planners, equipping them with the ability to use 3D visualisation for improved decision-making. The municipality is preparing for a broader transition to digital spatial planning.



Urban ReLeaf data visualisation platform

Explore Utrecht's Digital Twin

The Digital Twin of Utrecht is continuously evolving, with new data and applications being integrated.

Want to see it yourself? Check out:

[Utrecht in 3D](#)

[Netherlands in 3D](#)

Utrecht is both streamlining planning as well as creating pathways for citizens to actively shape their urban environment while driving climate resilience forward.

About the Project

Urban ReLeaf promotes collaboration between local communities and public authorities to address urgent climate issues related to urban greenspace planning, heat stress, and air pollution. Together with six European cities, they nurture citizen-powered environmental monitoring projects that bring the benefits of nature to everyone. Their mission focuses on community placemaking, public sector innovation, and tailored strategies to reach our common goal of creating greener, more just and resilient cities for all.

