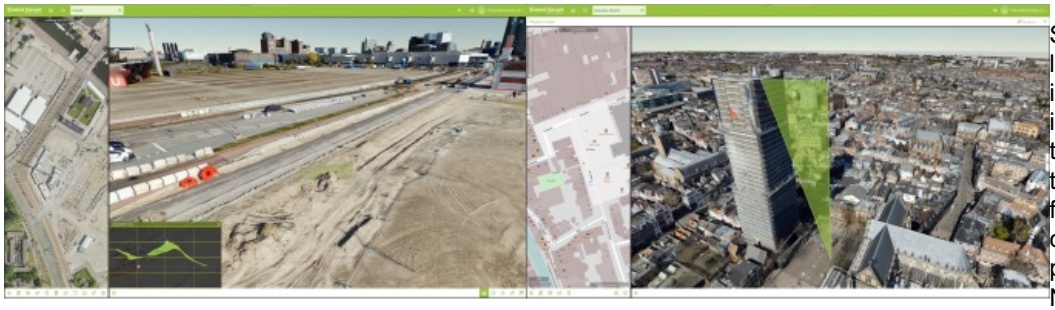
# CYCLOMEDIA COLLABORATES WITH HEXAGON TO CREATE FIRST-OF-ITS-KIND PHOTOREALISTIC 3D MODEL OF AN ENTIRE COUNTRY

# 3DNL â€“ The Netherlands from Every Angle



Smart digital realities that replicate real-life geoinformation provide valuable insights and support the analysis and interpretation of infinite data inputs from the real or digital world. They can be used to improve work processes and planning for commercial and government customers. 3DNL is a first-of-its-kind photorealistic digital twin of the entire Netherlands. It is based on airborne imagery and Lidar data, collected with a Leica CityMapper-2 aerial sensor and made accessible through Cyclomedia's Street Smart web viewer hosted on HxDR, Hexagon's cloud-based storage, visualization and collaboration platform.

## 3D Digital Realities Are Changing the Game

Cyclomedia has provided 360-degree street-level visualizations, collected with a patented vehicle-mounted camera, for decades. Since 2018, a Lidar sensor has been added to the proprietary mobile mapping system. These comprehensive ground-based data sets enable the extraction of light poles, manholes and an array of other features, providing insight for many municipal management and planning applications and other commercial activities.

3DNL cross section measurements of construction site.

Aware of the increasing demand for 3D data and wanting to maintain its position as a preferred aerial content supplier, Cyclomedia recognized the benefits of creating an innovative hybrid data set, offering both price and product delivery advantages. By creating 3DNL, the company has produced a multipurpose digital twin. As well as its direct use in Street Smart, the 3D data can also be streamed or downloaded for use in third party applications.

"We are making a big impact by creating a new way for customers to interact with data and develop insights to create smarter cities, achieve more efficient construction, and derive information from the data to provide knowledge," says Thomas Pelzer, product manager,

Cyclomedia. “The Netherlands is our primary market for making a photorealistic 3D model with an aerial perspective and for testing the market’s response to this new proposition.”


3DNL distance and height measurements.

Leica CityMapper-2, the state-of-the-art hybrid airborne sensor, is perfectly suited for efficient and accurate urban mapping. The simultaneous acquisition of oblique imagery and Lidar point clouds produces perfectly registered consistent data. The narrow field of view minimizes occlusions while the oblique scan pattern captures building facades from all angles. One flight instead of two reduces environmental impact, decreases the cost of data acquisition, and takes advantage of limited flying windows.

However, the most important benefit of using a hybrid system lies in the quality of the data products. Image-only systems struggle to provide accurate data in shadows, urban canyons and under vegetation. The Lidar data perfectly complements image data to fill the gaps. As an active sensor, it does not require light to create accurate data points and can provide returns from underneath vegetation. At the same time, the image data is crucial for the generation of textured 3D models. A hybrid sensor provides more information, more accurate measurements and smoother surfaces in the mesh.

“Adding a Lidar sensor to an oblique camera, as found in the Leica CityMapper-2, is a game changer. We have a strong preference for hybrid data and there are many advantages to joining forces on acquisition and development with a large global corporation such as Hexagon,” says Pelzer. “We are always looking for new ways to bring best-in-class products to market and Hexagon shares our enthusiasm for innovation.”


3DNL mesh of the Old Church in Delft.

## Unmatched 3D Mesh Quality

To capture the Netherlands in its entirety under favourable conditions, Cyclomedia partnered with Hexagon to capture aerial data each year between February and October and produce the best data set possible. After processing with Leica HxMap software, the aerial imagery and Lidar data as input was converted into a mesh and added to 3DNL. The 3D data is hosted on HxDR and fully integrated in Street Smart. HxDR enables the geospatial data and software to be visualized by users worldwide.

“The geometrically accurate 3D maps and models within 3DNL can be used in many applications by utilizing Street Smart’s functionality,” says Chantal Brick, marketing manager, Cyclomedia. “HxDR adds flexibility by working with us to accommodate Cyclomedia’s technical needs.”

Cyclomedia’s Street Smart viewer provides a simple way to access the hosted data set and includes a visualization tool plus other key features and functionality such as shade analysis, BIM models, cross-sections and measurements. It also supports the virtual collaboration of project stakeholders in any field.

The high-quality 3DNL data set is instantly available to users. Cyclomedia provides customers with access to the complete comprehensive 3D database through a subscription. Therefore, the data is not only virtually accessible, but also economically accessible to anyone with a need or desire to work with 3D data. The product is certainly less expensive than contracting a custom collection and 3D mesh creation.


3DNL mesh of Utrecht railway station.

## Practical Applications

Hexagon and its partners have made great strides towards creating a digital environment in which stakeholders and citizens can plan, visualize and simulate developments. Tasks such as importing CAD and BIM data, importing reality capture data, automesh of reality capture data, virtual tours and flythroughs, annotations and photosphere locations are possible.

The broad range of applications appeals to government and commercial customers. For example, a solar company may download the model of a specific house, calculate the pitch and slope, create a solar plan and present a proposal to the house owner. Construction and engineering companies can download an area of interest, design a new build and determine the most efficient access and logistics for the construction phase. A governmental agency may calculate how many trees are in a neighbourhood and plot heat pockets and perform shade analysis.

“There is great value in being able to visualize every aspect of a new structure and see how it fits with existing features before beginning construction,” explains Brick. “For example, local citizens can see how a wind turbine will look and better understand its impact on the community while working through the approval process.”


3DNL mesh of Utrecht.

The collaboration of Cyclomedia and Hexagon on this groundbreaking 3D digital twin project demonstrates the potential for the large-scale simultaneous collection of imagery and point clouds with the Leica CityMapper-2.

“We envision 3D to be part of a solution to accommodate users in a variety of work processes that need highly accurate data, as we offer through reality capturing,” says Pelzer. “We’re continuing to improve on the quality of both the input and the output data, and to leverage the classification of the point clouds to identify objects in the mesh models. By producing multi-use data sets, a variety of sectors such as local government, construction and engineering, infrastructure, and wind and solar energy all benefit from better information. Our long-term goal at Cyclomedia is to expand into other geographic areas with 3D, while a next milestone will be to systematically combine aerial and street-level content.”

Leica CityMapper-2 hybrid airborne sensor.

More Information:

cyclomedia.com | hexagon.com