

Romania

National Agency for Cadastre and Land Registration

Redefining urban insight with cutting-edge spatial technologies in Romania

“The reality we live in is transforming at an accelerated pace, under the influence of profound and interconnected changes - geopolitical, technological, climatic, and demographic - that directly impact our way of life and our day-to-day decisions. We therefore advocate for the broader integration of geospatial data, recognising its vital role in effective strategic planning, informed and accountable decision-making, and ongoing monitoring. Without a spatial dimension, statistical data often remain abstract and challenging to convert into practical measures that reflect realities on the ground.

In this context, I would like to acknowledge the commitment and professionalism of my colleagues in developing and implementing projects that harness modern technologies whose results provide tangible support to central and local administration as well as to key economic stakeholders and civil society. Through our collective efforts, we contribute to more robust public policies, more efficient services, and ultimately to fostering a safer, more balanced, and more prosperous environment for our citizens.”

Laurențiu Alexandru Blaga
Director General, National Agency
for Cadastre and Land Registration,
Romania

Romania is enhancing urban knowledge, strengthening territorial insight, and supporting evidence-driven management across diverse communities using modern surveying and analytical techniques.

In 2025, The National Agency for Cadastre and Land Registration, through the National Mapping Centre, successfully completed the ‘Creation of True Orthophotos for 150 Administrative-Territorial Units in Urban Areas’ project. This delivered a range of products for Bucharest and 149 other cities and county-seat municipalities). Data included dense point clouds, a 3D mesh for Bucharest, Digital Surface Models (DSM), and true orthophotos. The geometric quality of the DSM and true orthophotos was evaluated using root mean square error – altimetric for the DSM and planimetric for the orthophotos – leveraging advanced photogrammetry and digital cartography techniques.

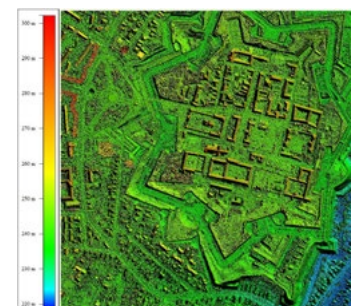
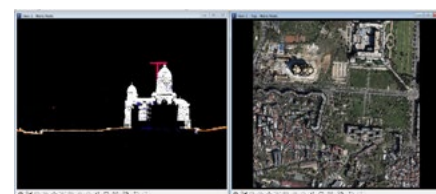
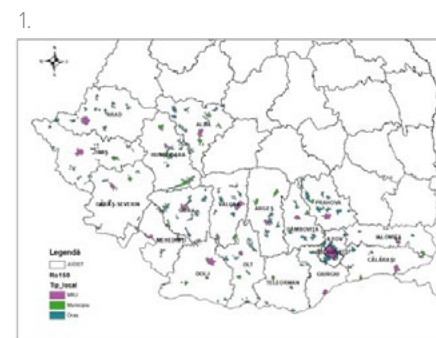
The project has expanded the coverage of orthophotos at the urban level and enabled the implementation of automated workflows for the reception, validation, and dissemination of geospatial data, resulting in highly precise cartographic products.

The city of Bucharest was aerially photographed in 2023 using the UltraCam Osprey 4.1 oblique photogrammetric camera. The oblique imaging technology provides several significant advantages for cadastral work, such as excellent visibility of rooftops and façades, the generation of multiple viewpoints, and easier interpretation of buildings (number of floors, ground footprint, etc.). The 3D mesh product obtained for Bucharest enables a wide range of applications, including:

- Estimating the impact of solar radiation on buildings.
- Assessing urban areas at risk of flooding.
- Conducting visibility analyses in the urban environment.
- Estimating noise propagation.

The products generated for the other 149 localities provide accurate information that can be used by local administrations and civil society for:

- Efficient energy management by estimating the photovoltaic potential of building rooftops and monitoring heat loss.
- Urban planning by updating maps, identifying unauthorised buildings or constructions, and conducting visibility analysis in urban environments.
- Environmental monitoring and prevention via risk analysis, temporal change analysis, and assessment of natural hazards.



1. The project area
2. Cross-section of the People's Salvation Cathedral – Bucharest
3. Example of detail in 3D mesh
4. Calculating exposure to open sky in urban areas
5. 3D identification of flood-prone areas

Benefits

- Providing precise analysis and planning tools for local and central authorities.
- Supplying the tools needed to generate spatial and temporal analyses of climatic factors and to monitor resources.
- Assessing the impacts of natural hazards.
- Identifying unauthorised constructions and ensuring their taxation, monitoring urban development, reducing tax evasion, and enforcing urban planning regulations.
- Producing highly accurate cartographic products.