

## Aspects of the implementation of the multi-purpose 3D cadastre in Poland

### Abstract

The civilization, technological and architectural progress of the 21st century resulted in the development of cadastral systems towards multipurposity and multidimensionality. A modern cadastre should perform fiscal functions and secure property rights to real estate, as well as serve the broadly understood the land administration. In Poland, work has been going on for years to integrate a data from the real estate databases. They are a consequence of global trends in the development of cadastral systems and the implementation of European law.

The introduction to the topic of this dissertation is an analysis of the historical conditions and principles of cadastral systems management in the world and in Poland, and the clarification of the concepts of modern multipurpose and multidimensional cadastre – 3D. It is noted that is the need to include networks and devices of the utility infrastructure in the cadastre system.

Based on a multidirectional analysis, a definition of a spatial property was proposed, which may be adequate to the needs of the three-dimensional cadastre. Moreover, attention was paid to the idea of the layered layout of rights to the property in the space above and below the ground. Polish legal regulations concerning the limitation of the scope – height and depth – of the property ownership right were discussed. A study of Polish legal acts was also carried out in terms of their suitability for building a multipurpose 3D cadastre.

In the next stage, a methodology was proposed to determine the credibility of the Geodetic Register of Land Utilities Network (GESUT) for the needs of the 3D cadastre based on the determined credibility level coefficient. The possibility of using in the 3D cadastre, in specific landform, the digital terrain model from the airborne laser scanning, which is available in the district databases of topographic objects, was also indicated.

**Key words:** multipurpose cadastre, 3D cadastre, utility infrastructure, spatial property

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