

3D-GIS: a Technology Waiting to Be Explored and Used



3D-GIS tools are very powerful. They add a third dimension to the already very strong and useful 2D-GIS functionalities, allowing complex sets of information to be combined with maps, plans and any other visual representations of spatial areas. Moreover, 3D-GIS opens up a very new form of geoanalysis, providing results that can be understood by various audiences – whether highly specialised civil servants involved in complex planning processes, local decision-makers tasked with choosing between planning alternatives or citizens seeking transparent processes and participation rights.

For the latter two groups, the core value of 3D-GIS seems obvious. Highly complex sets of information can be visualised in a comprehensible manner. Citizens can gain a first-person insight into planned development projects (e.g. in front of their own property), helping them

to understand possible individual consequences of plans. Decision-makers also benefit from this high comprehensibility, even though they require a greater level of detail in order to be able to decide on alternatives. Again, 3D-GIS not only provides a highly detailed representation of the real or the planned city, but it can also visualise all types of information linked with the model. In this context, decision-makers can be supported by additional information about the planning alternatives, such as energy efficiency, solar energy potential, traffic volumes or predicted emissions, in order to make information-based decisions.

Despite the significant role of visualisation in, for example, decision support, the planning experts do not only require solutions that help them to visualise plans and projects. In addition, they have a strong need for applications that simulate the effects and impact of planning alternatives on various thematic topics such as energy efficiency, climate compatibility or noise emissions for different building arrangements. Last but not least, the local planning experts benefit most from cross-sectoral datasets and applications. Comprehensive planning processes can only really be supported by linking simulation results for traffic, emissions, energy efficiency, climatological effects and suchlike.

Despite the opportunities of 3D-GIS as outlined above, it should be stated that this technology is currently lacking applications that serve the actual end-user needs. Due to their high complexity, the existing 3D-GIS tools are not yet ready for use by everyone, especially on the level of data analysis and provision. Two examples of existing market-ready applications are 3D solar cadastres and flood simulation tools. Both were requested by a specific group of end users to facilitate analysis based on specific demands and needs. Additionally, various 3D citizen participation tools are currently in development and are being tested in pioneer cities for formal as well as informal planning processes.

Nevertheless, this lack of applications should not be regarded as a burden. Instead, we should acknowledge the opportunity to design 3D-GIS applications that really address end-user needs and allow for the best possible benefit of 3D-GIS. Therefore, I am strongly in favour of an end-user-driven application development process and would encourage cities to participate in this process. Those who overcome their fear of such new technologies and participate in the development process of novel applications will benefit the most, receiving applications that fit their specific needs and help them to solve their problems.

About the author

Willi Wendt is a rural and regional planning engineer and works as a senior researcher for the Fraunhofer Institute for Industrial Engineering (Fraunhofer IAO) in Stuttgart, Germany. His research focus lies on city system design and city resilience – two topics that are highly relevant for 3D-GIS solutions. He is currently in charge of the scientific design of the 'Smarter Together' EU Lighthouse project which seeks to stimulate co-created city development processes between the three partner cities: Lyon, Munich and Vienna.