

# **The Application of 3d Network Analyses for Determine the Time Zones of the Evacuation in Multi–Storey Building**

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## **SUMMARY**

Today, we live in a time when we can not imagine the smooth functioning of civilized society without using of multi-storey buildings. In every major city in such buildings are located public institutions such as offices, schools, hospitals, but also dwellings. Safety of people staying in public buildings is a priority for managers of these facilities. One of the main risks that may occur and require the evacuation of the occupants of the building is a fire. In order to secure the building when the people are determined evacuation routes, this task belongs to the engineers and technicians of firefighting. The most important criteria that must be fulfilled for the escape route is the shortest length. The requirements that must be met for the transition evacuation are defined in separate regulations, and on Polish territory is a regulation of the Minister of Infrastructure dated 12 April 2002 on the technical conditions to be met by buildings and their location. Determination of the shortest route is the task of the scope of the canon of GIS analysis, and more specifically of network analysis. Geographical Information Systems offer a wide range of tools for 3D modeling and 3D analysis, and for several years we can also conduct 3D network analysis in buildings. The paper presents the possibilities of using GIS tools to verify fire protection in multi-storey premises. Analysis were carried out on the example of 7 -storey building, in which the Department of Mining Surveying and Environmental Engineering AGH in Krakow is situated. The building was built in the 50s of XX century. In 2011 it underwent a complete renovation. As a result of which it has been changed passageways and thus escape routes. Author using GIS tools has made revision the level of safety and the possibility of evacuation in the state before and after renovation. There were given the steps of preparing the data, as well as set out the requirements and formats in relation to the data that could be used to 3D network analyze. In the paper there were presented the possibilities and limitations of the available GIS tool in the field of 3D network analysis in buildings.