

Application of DTM in Urban Planning Process to Improve Air Quality.

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SUMMARY

In recent years, the problem of air pollution in cities has significantly increased. According to the latest ranking published by the World Health Organization (WHO), there are 36 Polish urban centres among 50 European cities with the highest concentration of PM2.5 particulate matter. In order to improve the situation, corrective and preventive actions can be taken. The first of these mainly include the shift towards more ecological fuels and increasing the biologically active area. The second group includes, among others optimizing existing planning documents. From the point of view of the location of buildings, in particular industrial plants, the most favourable are the highest areas, where the dust generated as a result of fuel combustion can be dispersed much faster. Unfortunately, the applicable provisions of Polish law do not impose an obligation to include terrain elevation in spatial planning. The growing problem of smog has stimulated the analysis of planning documents for selected Polish cities from the list published by the WHO taking DTM into consideration. First of all, on the basis of DTM, three zones (unfavourable, advantageous and very favourable) were determined for each of the test areas from the point of view of the location of buildings. Then an index was established, which was called the Elevation Planning Potential that allows to determine whether and to what extent there are possibilities to make beneficial changes from the point of view of air quality in planning documents taking into account the terrain shape. It takes into consideration both information from DTM and data determined on the basis of urban planning documents covering the existing development and land-use as well as planned spatial development directions. The solutions developed can significantly improve the air quality in cities by optimizing the location of new buildings.

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