

Cartographic visualisation of the spatial location of external hydrants for the fire brigade purposes

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Abstract. The objective of research was to elaborate a cartographic visualisation facilitating the decision-making process in terms of the spatial availability of external hydrants and the provision of water for rescue and fire-fighting operations. The research project conducted for the city of Poznań was carried out in cooperation with the fire brigade in the form of an application.

The large-scale thematic map elaborated following the performance of research contains information about the three basic topographical objects falling within the interest of the fire brigade from the point of view of operational activities undertaken thereby. First and foremost, this concerns the location of hydrants and the buildings secured thereby, as well as the course of access roads.

Information about the types of hydrants has been visualised by the application of signatures. Apart from the thematic layers made up by topographical objects, of considerable importance from the point of view of information are the layers that come into being as a result of analyses in the desktop GIS application. The basis for spatial analyses conducted using the geometry of vector objects was the regulation specifying fire-fighting requirements governing the provision of water. The cartographic method of equidistances were used to express the distance of buildings from hydrants. Equidistances constituting lines of identical distances, routed within a spatial interval of 15 metres from the hydrants were generated in the GIS application utilising a tool for designating buffer zones. The interval selection corresponds to the standard length of a section of fire hose. The

method of triangulation was used to determine the distances between neighbouring hydrants. The application of Thiessen's polygons, for which the hydrants acted as generators, made it possible to create an irregular network of varying density.

The cartographic visualisation containing this information makes it possible to more rapidly find the nearest hydrant of a specific type, and also to initially assess the number and lengths of fire hoses required to carry out an operation. Since the spatial information has been juxtaposed with standards set forward in legal regulations and spatial analyses performed in accordance with these parameters, it became possible to isolate areas where a fire-fighting operation could be conducted with the greatest chance of success.

The possibility of displaying the monitor map thus prepared on a mobile device, such as the ever more popular tablet or smartphone with a built-in GPS receiver, means that it can also be used at the location of a fire during fire-fighting activities.

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