Making Public Transport More Accessible with GIS Location-Allocation Analyses

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Key words: Geoinformation/GI; Spatial planning; spatial analysis; network analysis; transport accessibility

SUMMARY

Efficient and accessible public transport is an essential part of the beating heart of a city, enabling the population to meet their needs without being forced to use individual means of transport. In the town of Brzeg Dolny, the existing bus line was not popular with residents due to its complicated route with long walking distances to the stops. In search of a better solution, GIS was used to support decision-makers. The main topic of the paper is the possibility of using spatial analysis in planning optimal locations for bus stops and public transport routes. To create the analysis, publicly available data was used: the BDOT10k database and data from the OpenStreetMap community service. Most of the work was carried out in the ArcGIS Pro environment.

Data-enriched locations of demand points - residential buildings and points of interest - were identified. Later, all possible locations of stops on bus-accessible roads were automatically generated. Thanks to the location-allocation analysis with an appropriately selected algorithm, a layer of optimal bus stop locations was obtained by connecting bus stops to demand points via shortest walking paths. Later, a public transport route was created through the identified bus stop locations. This proved, compared to the current solution, that the GIS technology GIS can effectively improve the accessibility and profitability of public transport and make an important contribution to sustainable mobility. The work was finally handed over to the mayor of the city who, after considering the promising results, plans to reorganise the public transport network with the help of GIS.