

## Optimization in Locating Firefighting Stations Using GIS Data and AHP Model; A Case Study on Arak City

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**Abstract :** In recent decades, locating urban services is one of the significant discussions in urban planning. Among these considerations, cities require more accurate planning in order to supply citizen needs, especially part of urban safety. In order to gain this goal, one of the main tasks of urban planners and managers is specifying suitable sites to locate firefighting stations. This study has been done to reach this purpose. Therefore effective criteria consist of coverage radius, population density, proximity to pathway network, land use (compatible and incompatible neighborhood) have been specified. After that, descriptive and local information of the criteria was provided and their layers were created in ArcGIS 9.3. Using Analytic Hierarchy Process (AHP) these criteria and their sub-criteria got the weights. These layers were classified regarding their weights and finally were overlaid by Index Overlay Model and provided the final site selection map for firefighting stations of Arak city. The results gained by analyzing in GIS environment indicate the existing fire station don't cover the whole city sufficiently and some of the stations have established on the unsuitable sites. The output map indicates the best sites to locate firefighting stations of Arak.

**Keywords :** site-selection, firefighting stations, analytic hierarchy process (AHP), GIS, index overlay model

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