Using Extent Analysis Method for Risk Assessment of Road Network in Hazmat Transportation

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Abstract

Risk is an important factor in hazardous material routing problem. In general, it is defined based on the probability of road accidents and their impacts. Due to lack of data for calculating risk factors, influenced by hazmat accidents and their impacts, this paper attempts to define road network risk factors to be used in hazmat transport field. In the present paper, risk is proposed according to its components including our types of accident, population, environment and infrastructure issues. Risk components are presented as linguistic variables by five experts and extent analysis method, a well-known method of converting fuzzy variables to crisp values, has been utilized to convert linguistic variables to crisp values. The proposed method was applied in Fars as case study, the second largest province in Iran and results, presented on details, show that normalized risk factors can be obtained using the extent analysis method and they will be used for finding the safest path in Hazmat transport planning.

Key words: Risk analysis, Linguistic variables, Extent Analysis Method, Hazmat Transportation