ISC
Islamic World Science Citation Center
ISSN 2645-7784
Journal of
Urban Social Geography
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Spatial-spatial analysis of the inland urban crash using spatial GIS and Fuzzy Model (Case study: Kerman city)

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ABSTRACT

Objective: The city of Kerman has seen many developments over the past decades. These developments include: physical development, urban population growth, inertial migration, marginalization and horizontal expansion of the city while maintaining the administrative, economic and cultural center of the South East, but building infrastructure, especially in the urban transport sector, in proportion to this developments have not been made.The present study, with the understanding of the importance of the subject and considering the position of Kerman city and the lack of coherent studies in this regard, it has been tried to investigate and analyze the dispersion of accidents in the city of Kerman by using GIS technology and fuzzy model and prioritize the accidental areas using the strategic planning to organize incidental urban areas.Experts opinions and studies survey, show that in addition to cultural issues, the top ten factors affecting the rate of accidents, population density, density of accidents, density of service centers and passageways play the most role in the amount of accidents.Based on the combination of effective factors and fuzzy method, three areas of Azadi Square, Khoyane Motahari and jihad are the most susceptible to intractable accidents, respectively. According to traffic flow projects in Azadi Square, Motahari avenue (Motahari Park) has three ways Taleghani) was designed to organize using strategic planning.Considering the opinions of experts in urban transport SD (Urban Sustainable Transportation), its objectives and criteria were studied in the study area and then, using the SWOT technique, while identifying the strengths, weaknesses, opportunities and threats, and The scenarios were designed to organize the scenario, with the choice of the time and money limits, and proposed operational plans .In this scenario, attention has been paid to public transport, pedestrianism, cycling and environmental protection.

Methods: Since the method of this research is descriptive-analytic, to investigate the first hypothesis (factors affecting the dispersion of accidents) after collecting information and initial data, library studies as well as field studies and surveys, the map The topics are then prepared using the GIS and the fuzzy model of the analysis. The work is done in such a way that the data are first entered into the geographic information system and after geometric correction and specification of the study area (Kerman city) the required information is attached to the maps and the maps in the specified format the effect of each factor has been evaluated by comparing the existing crash situation. To investigate the second hypothesis (how to distribute and disperse the crashes) using GIS-related analyzes such as Spatial Analyst, 3D Analyst, and Interpolation, etc. Using the proposed methods for combining (fuzzy) maps with each other, the map the desired ones are produced. The method of data integration in this study will be combined with the fuzzy model and software. Initially, the necessary criteria are prepared; after the preparation of these criteria, in the locating phase due to the spatial property of most of the information, the initial studies in the GIS environment, considering the features of this software in the analysis and interpretation of spatial information, Takes place. After preparation of different layers based on different criteria of the region, using the commands in the GIS software, initialization is performed.

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Findings: To determine the relative importance of different factors in locating, weights are considered for each of them. After determining the factors in the previous sections, the weight of each of the factors was determined using the method of rating the rating method according to experts. In this method, between the various criteria, from 0.1 to 0.9 weight of the factors. In this research, fuzzy factor maps have been constructed in a way that the amount of each one indicates the suitability of the location in terms of that factor and indicates the relative importance of the plan of the factor in question as compared to other factor maps should be.

Results: There are several factors involved in the occurrence of accidents and the identification of accidental points. Analysis of these factors without access to a spatial and informational database is not an easy task; therefore, accident analysis from a GIS location point of view is an activity recently taken up by road carriers. Spatial analysis using spatial information system (GIS) is the first and most important step in identifying accidental points in this paper. The results of the research show that in addition to cultural issues, population factors, topography (city slope), road network, existing crash maps, residential centers, service centers, educational centers, health centers, bus stations and taxi stations, 4 population density factors , The density of existing accidents, the density of service centers and the network of streets play the most role in the amount of accidents, as well as studying the method, combination and combination of factors, shows the classification of criteria in the conventional methods of weighing the layers It is only noted by the experts. Results in Kerman show that in this method, more than 40 hectares of Kerman city limits are in high risk of accidents, due to the lack of precision of this method, in addition to the high area, there are also errors. However, in a fuzzy method that has the advantage of selecting a more precise weight of the criteria, so that the weight of each criterion is in addition to the expert opinion based on the technique of the matrix comparison of the pair and the analysis of the inconsistency index, which combines the data With a fuzzy method, for the city of Kerman, about 6 hectares of urban areas are at high risk of collision, which is also highly accurate and there is the possibility of organizing these areas, which ultimately lead to three areas of Azadi Square, Motahari Street and Jihad The most prone areas of urban road accidents were selected.

Keywords: Strategic Planning, Geographic Information System (GIS), Intra-City Accidents, Fuzzy Model, SD Sustainable Transportation, SWOT Analysis.

Received: January 17, 2018 ***Reviewed:*** December 10, 2018 ***Accepted:*** March 10, 2019 ***Published Online:*** September 22, 2019

Citation: Hasani, V., Jahanbin, N (2019). ***Spatial-spatial analysis of the inland urban crash using spatial GIS and Fuzzy Model (Case study: Kerman city).*** Journal of Urban Social Geography, 6(1), 57-70. **(*In Persian*)**

DOI: 10.22103/JUSG.2019.1978

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