Spatial-Temporal Analysis on Urban Traffic Accidents: A Case Study of Tehran City, Iran

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(1) Motivation: This study gives an insight into the urban traffic accident of Tehran city and spatial-temporal analysis on urban traffic accidents. According to the methodology of this study urban structure (Figure1) are important factor which contributes to urban accidents. The temporal analysis aims to discover the relative risk pattern temporally and can be used as prerequisites for spatial analysis targeting spatial patterns in different time periods. The analysis is based on different primary and secondary data sources, which include locations of accidents and attributes such as date, reason, kind, etc.

(2) Approach: The main objective of this study is necessary therefore to have an understanding structure of urban and accidents for improving safety on the roads which will be done with GIS as GIS is a comprehensive management tool for traffic safety.

(3) Result and Discussion: It was found that the incidence of accidents over time and over urban structure which is different urban zones, population and land uses was closely associated with the functions and land use characteristics of an area. Both the temporal and spatial analyses of accidents somehow reflected the nature and characteristics of the underlying land use pattern. The results suggest that certain land uses are associated with high potential risk of urban traffic accidents. Moreover, more attention and resources need to be placed on areas of high-density, pedestrian accident prone commercial and commercial/residential uses (Figure2). During the rush hour of the congestion, posted speed limits and are often believed to have little effect on driving speed, except during the build-up of queues and their later dispersion. The insight that travel speed is dependent on factors such as land use type, levels of congestion, and drivers personal speed preferences, suggest that the relationship between speed limits and travel time is far more complex than most drivers are willing to admit. Time period variations clearly show that the black time period is changing by land use category and urban zones. Whereas not all statistical correlations are causations, combining the spatial analysis with the statistical analysis provides a stronger argument with regard to the validity of the findings in this research.

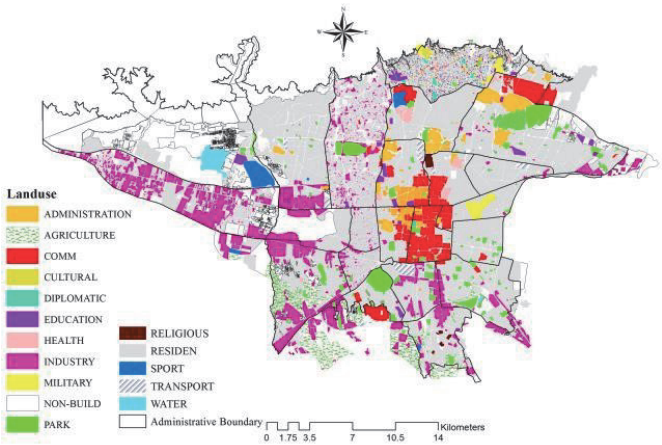

Figure 1: Urban Structure of Tehran

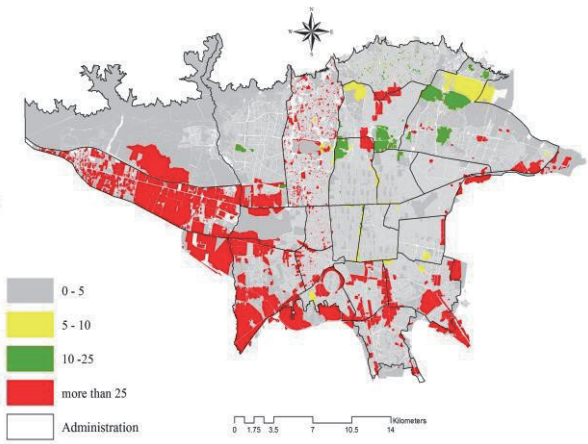

Figure 2: Accidents by landuse 0:00~6:00