

## Relation between Urban Traffic Accidents and Urban Structures from Spatial Perspective

Niloofar Haji Mirza Aghasi

Division of Spatial Information Science, Graduate School of Life and Environmental Sciences,  
 University of Tsukuba

Email: <nia922@yahoo.com>

- (1) **Motivation:** This study gives an insight into the urban traffic accident condition of the Tehran city and shows out the most potentially accidents prone roads in the Tehran urban areas. According to the methodology of this study time is an important factor which contributes to Tehran's 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) **Results and Discussion:** The analyses have utilized highly disaggregate spatial units for an analysis of area specific variables associated with urban traffic accidents traffic. Findings suggest that urbanized, more densely populated areas, with few numbers of highways and freeway and traffic limitation zone will tend to have fewer dangerous accidents which is fatal accidents, particularly while areas with higher employment density and more highways and freeways have more traffic casualties. The first effect may be cause to reduced speeds and higher levels of congestion or possibly the lower design speeds of roads in dense areas such as city centers. The next issue may be due simply to increased levels of street activity in city area with more exercise. Results suggest that increasing speeds in urbanized areas by reducing congestion may have adverse safety consequences. Granting to the accident data and this study, travel time may be more dependent on congestion and road qualification and geometric elements, than posting on the speed limits. 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 road 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. Road type variations clearly show that in contrast to many cities in the world, Tehran's highways and expressways are not the most dependable for driving. The finding that areas with higher levels of social deprivation have relatively higher casualty rates is also consistent with other findings, although this effect is less stronger when only motorized casualties are considered. I have analysed many of the road and accident characteristics that would be likely to vary Urbanized between areas. It might be that people with lack of traffic's knowledge tend to locate in areas with more unsafe traffic. Increased road length was associated with increased serious injuries, especially for highways, which were also associated with increased slight injuries. Further analyses of Tehran's accident data can exploit additional spatial relationships. This includes potential spatial autocorrelation that can help identify similar unidentified factors between areas that affect casualties. Time series data would also allow a more analytical of changes over time and would enable to avoid problems of heterogeneity in the data. More densely populated areas, with few numbers of highways and freeway and traffic limitation zone and traffic limitation boundary will tend to have fewer dangerous accidents which are fatal accidents, particularly while areas with higher employment density and more highways and freeways have more traffic casualties. 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. Land use category, urban dense and increased road length was associated with increased serious injuries, especially for highways, which were also associated with increased slight injuries.



Figure 1: Spatial Extent of Study Area

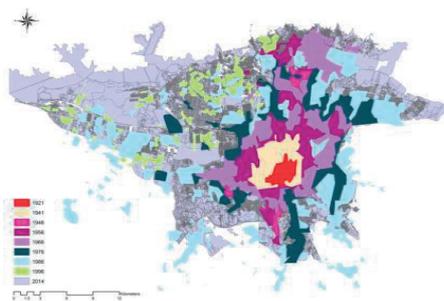


Figure 2: Tehran Urban Development

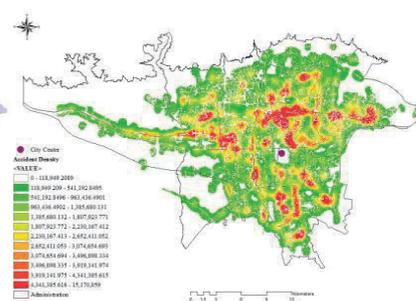


Figure 3: Tehran's Accidents Density