

Investigation Between Urban Traffic Accidents and Urban Structures from Spatial Perspective

Haji Mirza Aghasi, Niloofar^{1*}

¹Department of Geoenvironmental Sciences, University of Tsukuba

Urban Traffic Accidents have been and continuing to be a major contributor of human and economic costs to requiring concerted multi-disciplinary efforts for sustainable effective prevention. Traffic accidents rank in the top ten causes of the global burden of disease and injury, and will probably be in third place by 2020, when measured in disability-adjusted life years lost (WHO, 2013). Urban structure and urban activities in a city or metropolitan area, make a significant involvement in generating interactions and accidents. Investigation of traffic accidents and urban structures such as road networks, land use patterns, public facilities, etc. from spatial perspective is important for future urban planning processes. The urban interactions and activities can happen between districts or within a district, on different roads and different time and space.

The study area of this study is Tehran city which include 22 districts. Tehran is the largest city in Iran and also its capital. Its population is close to 12 million during day time and over 8.5 million people at night. The analysis in this study is based on data obtained from the Police Department of the Islamic Republic of Iran, Tehran. The main database contains information about all police-reported urban traffic accidents that occurred in 2011 in Tehran. Tehran has experienced a rapid growth of urban population. With the expansion of the city boundaries, even though there is an occurrence of urban transportation and large usage of cars for daily urban trips and large number of accidents, make the Tehran accident problem more serious. The Tehran spatial structure has a high density structure combined with a several central pattern. The lack of strong and unique essence, as easily as the spatial distribution of employment, are mostly associated with the build-up density and accidents but less dangerous accidents. The current spatial structure of Tehran, which is a high density city unaccompanied by influential Central Business District (CBD) creates several limitations, so that we can see the distribution of the accidents whole of the city. A rapid and continued rise in living accommodations and land costs is expected in cities with transportation improvements and rapid economic and population growth. Humans, nations, regions and the world would be seriously limited in development without transportation, which is a central element for physical and economic growth. Urban growth occurred as physical and functional changes took place, due to the transition of the rural landscape to urban forms, which has been studied by various researchers (Thapa and Murayama, 2010). These changes as well influence the urban density, which would be the increase of the growth rate in several dimensions. Transportation network systems, urban construction and urban traffic accidents are interdependent each other. Urbanization is taking place at a rapid pace in Tehran, and this expanding city is changing the urban structure. Land use is one of the most important pillars in creating urban areas, and thus, creating transportation and road patterns have a direct impact on urban traffic accidents. The combination of high population and growth of land use causes the increase of daily trips that produce urban traffic accidents in the city. Agreeing to this varying communication between land use and the road network, which is causing traffic accidents, also calls for an agreement on how the land use is associated with urban traffic accidents. An explanation of the connection between the several land uses and occurrence of urban traffic accidents in Tehran's metropolitan area indicates that land use generates different kinds of causes, which are brought about by various actions. It 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.

Keywords: Urban structure, Urban Traffic Accidents, Spatial Analysis, GIS