Trip generation and its relationship with land use diversity: Case studies of four urban districts in Shiraz metropolitan area

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Extended abstract
1-Introduction
This paper attempts to discover the differences existing among case study areas in terms of trip generation despite the varied physical attributes among them. The research hypotheses include: first, there is a significant difference in trip generation per capita (inter-zonal and intra-zonal trips) among the case study areas. Secondly, there is a linear correlation between land use diversity and trip generation. Thirdly, socio-economic characteristics are associated with trip generation. Travel diary data of four urban districts of Shiraz metropolitan were collected through questionnaire survey of totally 455 individuals - to examine the link between trip generation and land use patterns at a community level.

The research focused on the potential role of socio-economic, spatial and traffic factors in reducing extra-zonal trips.

The case study areas included two urban districts located within Region 1 (Molasadra and Ferdousi), and two of Region 4 (Ghodousi and Ghadamgah). Regions 1 and 4 are important parts of Shiraz Metropolitan which are located on north and west of Shiraz respectively. These districts were selected based on the differences existed in socio-economic and physical attributes. For this reason, two indices including median household income level and land use mix entropy were applied.

2- Theoretical bases
The location of activities and distribution of land uses may have a great influence on travel behavior. In this way, land use mixing policy may be used as a practical solution in order to reducing traffic congestion. Since travel demand is derived from the distribution of main land uses and activities including job location, educational centers, recreational sites or public service areas, thus reducing travel
demand through applying land use policies are recommended.

3– Discussion
Trip generation at local level is affected by household characteristics; however, its inter-zonal and intra-zonal patterns are different. Trip destination choosing is influenced by household requirements. Households with greater number of adults and students try to choose their travel destination out of zone area, while those households with more school students and children are interested to achieve their daily needs within the zone. In the other words, facilities within zone border are supportive for some limited requirements. On the other hand, having a vehicle available encourages higher trip generation. It was found no significant correlation between trip generation and some social factors such as individual income, household’s head income, education and number of employees. The number of inter-zonal and intra-zonal trips is affected by the presence of non-residential activities as well as land use diversity. The higher the share of non-residential activities, the higher the inter-zonal trip generation is. In fact, having accessibility to varied local services and facilities can discourage making long trips, while local trips are expected to increase.

4– Conclusion
A comparative description and the results of statistical analysis including analysis of variance and bivariate linear correlation indicated that there is a functional relationship between land use diversity and the volume of urban travel as either intra-zonal or extra-zonal. Therefore, an appropriate distribution of urban services can be useful in reducing extra-zonal trips leading to a considerable decline in traffic volume. Local facility providing may encourage residents to travel more. Trip generation is also associated with household type. Households with adults make more external trips than those comprising children. In addition, owning a car increases the probability of making trips.

5– Suggestions
Some of the applied suggestions of this study could be summarized activity allocation basing on accessibility to transport networks and facilities as well as mixed development at local scale. Furthermore, if local services are distributed according to a hierarchical structure, then commuting to diversified parts of the metropolitan would decrease significantly.

Key words: Land Use, Trip Generation, Accessibility, Urban Facilities, Shiraz.

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