A007 ENGR

Analysis of Factors Affecting Pedestrian and Bicycle Crash Frequency

Abstract:
The objective of this study was to investigate factors influencing occurrence of pedestrian and bicycle crashes in Tennessee. Areas of interest were demographic, socio-economic, roadway geometry, traffic, and land use factors that could influence pedestrian and bicycle crash rates on specific infrastructure. Geographic Information System (GIS) and statistical modeling were applied to study the crash patterns with respect to these factors. GIS was used to geo-locate and cluster the crash locations onto the roadway network remove comma joined with background data of the crash locations. Negative Binomial (NB) regression was used to model the relationship between contributing factors and the crashes to detect any positive or negative correlations with the crashes. The following factors were found to have significant correlation with pedestrian and bicycle crash occurrences: percentage distribution of population by race, age groups, mean household income, percentage in the labor force, poverty level, and vehicle ownership. Land use, number of lanes crossed by pedestrians or bicyclists, posted speed limit and the presence of special speed zones, were all found to influence the occurrence of these crashes significantly. The findings were used to identify patterns of demographic, socio-economic, and (geographic or geometric) variables in pedestrian and bicycle high crash locations in Tennessee and using that pattern to flag other areas to indicate to TDOT they, also, are more likely to experience pedestrian and bicycle crashes.