

Traffic Accidents Cause and Effect Analysis: A Case Study in Chattanooga, Tennessee

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Abstract— Motor vehicle crashes are a major cause of fatality in the United States. Chattanooga ranks 4th in the state of Tennessee for traffic accidents which has continued to increase in the past decade. Using a geo-spatial regression model, this project investigated the variables related to weather, property type, collision type, driver characteristics, and spatial factors to see if they play an influencing factor in the number of accidents road occurred during different lighting conditions. The utilized dataset contains police report information on recorded traffic accidents that took place in the city of Chattanooga, TN over a three-year timespan, from January 2018- December 2020. A total of 37,053 records were analyzed and the location analysis identified hotspot locations where motor crashes and fatal accidents have occurred the most. The findings showed that a large majority of fatal accidents happened near a highly industrial area along Amnicola highway. Also, Hamilton place mall area was identified as one of the hotspots where accidents occurred more frequently than other locations. Other findings indicated that the impacts of some driver related variables and collision types on accidents were greater than other factors. The results of this study can be used by local authorities to address the issues at particular hotspot locations and to strategize road safety regulations.

Keywords—*Road Accidents, Spatial, Logistic Regression, Chattanooga*