

### Abstract

The geometric design of roads is the branch of highway engineering concerned with the positioning of the physical elements of the roadway according to standards and limitations. The essential objectives in geometric design are to optimize efficiency and safety while minimizing cost and environmental damage. In this study, primary and secondary data have been used. Data is collected from different institutions of Lahore TEPA (Traffic Engineering and Planning Agency), NESPAK (National Engineering Services Pakistan), CTP (City Traffic Police) and Rescue 1122. The registered traffic accidents have been used from 01/01/2013 to 31/12/2015. Two phase sampling technique has been used. On first phase, secondary data is carried out about demographic information and physical characteristics from CTP. On second phase, primary and secondary data are obtained about geometric design of roads from TEPA. Google earth and Auto Cad are also used for geometric design. All registered traffic accidents from Lahore has been as target population and all the registered traffic accidents are used from Ferozpur Road, Multan Road, Canal Bank Road and Grand Trunk Road as a sampled population. Generalized linear models for count data: Poisson regression and negative binomial regression are discussed in this research. SPSS and R-Language are used for analysis.

The results show that most of accidents occur at office off timing. Numbers of accident increase in 2014 as compare to 2013 but in 2015 frequency of accidents decrease. A large number of accidents arise fatal due to reckless driving and over speeding. In mostly accidents, cars and tralala hit the bikes and Pedestrians. Most of accidents occur on Friday and Monday in summer season. From registered sample of accidents, numbers of death are 197 and numbers of injuries are 311 in time period from 2013 to 2015. Poisson regression is applied only because of equidispersion occurs. If overdispersion occurs, negative binomial regression is also applied on this data and compares both regressions results. The Poisson regression model gives good description of number of accidents depending on various explanatory variables. Number of lanes, type of locations and roadway light are statistically significant. Narrow Shoulder width (m), Median Width (m) and Lane width (m) increase accident occurrence. Three lanes and larger road structures

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increase accidents. Numbers of accident increase when Roadway, type of locations, roadway light and traffic control signals decrease.