

## INVESTIGATION OF INFLUENTIAL FACTORS FOR BICYCLE CRASHES USING A SPATIOTEMPORAL MODEL

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**KEY WORDS:** bicycle crashes, spatiotemporal, random parameters, time-varying coefficients, traffic analysis zone, Bayesian

### ABSTRACT:

Despite the numerous potential advantages of indulging in bicycling, such as elevation of health and environment along with mitigation of congestion, the cyclists are a vulnerable group of commuters which is exposed to safety risks. This study aims to investigate the explanatory variables at transportation planning level which have a significant impact on the bicycle crashes. To account for the serial changes around the built environment, the linear time trend as well as time-varying coefficients are utilized for the covariates. These model modifications help account for the variations in the environment which may escape the incorporated variables due to lack of robustness in data. Also, to incorporate the interaction of roadway, demographic, and socioeconomic features within a Traffic Analysis Zone (TAZ), with the bicycle crashes of that area, a spatial correlation is integrated. This spatial correlation accounts for the spatially structured random effects which capture the unobserved heterogeneity and add towards building more comprehensive model with relatively precise estimates. Two different age groups, the student population in the TAZs, the presence of arterial roads and bike lanes, were observed to be statistically significant variables related with bicycle crashes. These observations will guide the transportation planning organizations which focus on the entity of TAZ while developing policies. The results of the current study establish a quantifies relationship between the significant factors and the crash count which will enable the planners to choose the most cost-efficient, yet most productive, factors which needs to be addressed for mitigation of crashes.

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