World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:10, No:11, 2016

Influence of Travel Time Reliability on Elderly Drivers Crash Severity

Authors : Ren Moses, Emmanuel Kidando, Eren Ozguven, Yassir Abdelrazig

Abstract : Although older drivers (defined as those of age 65 and above) are less involved with speeding, alcohol use as well as night driving, they are more vulnerable to severe crashes. The major contributing factors for severe crashes include frailty and medical complications. Several studies have evaluated the contributing factors on severity of crashes. However, few studies have established the impact of travel time reliability (TTR) on road safety. In particular, the impact of TTR on senior adults who face several challenges including hearing difficulties, decreasing of the processing skills and cognitive problems in driving is not well established. Therefore, this study focuses on determining possible impacts of TTR on the traffic safety with focus on elderly drivers. Historical travel speed data from freeway links in the study area were used to calculate travel time and the associated TTR metrics that is, planning time index, the buffer index, the standard deviation of the travel time and the probability of congestion. Four-year information on crashes occurring on these freeway links was acquired. The binary logit model estimated using the Markov Chain Monte Carlo (MCMC) sampling technique was used to evaluate variables that could be influencing elderly crash severity. Preliminary results of the analysis suggest that TTR is statistically significant in affecting the severity of a crash involving an elderly driver. The result suggests that one unit increase in the probability of congestion reduces the likelihood of the elderly severe crash by nearly 22%. These findings will enhance the understanding of TTR and its impact on the elderly crash severity.

Keywords : highway safety, travel time reliability, elderly drivers, traffic modeling
Conference Title : ICCCSE 2016 : International Conference on Civil, Construction and Safety Engineering
Conference Location : Singapore, Singapore
Conference Dates : November 21-22, 2016