Speaker : **A M Hasibul Islam**

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Title: **Investigating Rural and Urban Differences in Single-Vehicle Crash Severity Determinants: A Time-of-Day Analysis using Random Parameter (Mixed) Logit Models**

Abstract:

Thousands of people lose their lives due to traffic crashes every year. The US had 36,096 traffic-related fatalities in 2019 alone and single-vehicle crash deaths account for 53 percent of the total fatalities nationwide and had been consistently around 40 – 50 percent for the last few decades. This study investigates the factors associated with single-vehicle crash injury severity accounting for urban-rural differences and time-of-day variations. We estimate mixed (random-parameter) logit models (with the pseudo direct elasticity values) using five-year (2014 – 2018) of crash data from Kentucky for five periods of the day: 12 am – 5 am, 5 am – 9 am, 9 am – 2 pm, 2 pm – 7 pm, and 7 pm – 12 am. Log-likelihood tests confirm the statistical validity of the time-of-day grouping of the crash severity models and the urban-rural separation. Our results indicate variations in the effects of factors across different time-of-day. Results show that rural roads with ice increase the probability of serious injury for 9 am – 2 pm and 2 pm – 7 pm models and increase fatality probability for the 9 am – 2 pm model; rural road crashes involving oversteering by drivers increases the probability of serious injury for the 12 am – 5 am model, and the 5 am – 9 am model. This variable is found to decrease the probability of serious injury for the 9 am – 2 pm model and for the 7 pm – 12 am model; female drivers in rural crash models are found to be less prone to fatality except for the 12 am – 5 am model, and the effect of this variable is found as random in the 5 am – 9 am, 9 am – 2 pm and 2 pm – 7 pm models. The findings of this research can be applied to improve state-specific Crash Modification Factors (CMFs) and Safety Performance Functions (SPFs).