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## The Effects of Inaccurate and Missing Highway-Rail Grade Crossing Inventory Data on Crash Model Estimation and Crash Prediction

Aemal Khattak

M. Umer Farooq

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## Conference Presentation

Khattak, A.J., and Farooq, M.U. The Effects of Inaccurate and Missing Highway-Rail Grade Crossing Inventory Data on Crash Model Estimation and Crash Prediction (No. TRBAM-23-00338). *Transportation Research Board (TRB) 102nd Annual Meeting*, January 8-12, 2023, Washington DC, 2023.

URL Link: <https://annualmeeting.mytrb.org/OnlineProgramArchive/Details/19372>

### **ABSTRACT:**

Most highway-rail grade crossing (HRGC) crash models in the US rely on the Federal Railroad Administration's (FRA) highway/rail crossing inventory database. Any errors and/or incomplete information in this database affects the estimated crash model parameters and subsequent crash predictions. Using 560 HRGCs in Nebraska, this study illustrates differences in crash predictions obtained from the FRA's new (2020) Accident Prediction and Severity (APS) model when: 1) using the unaltered, original FRA HRGC inventory dataset as input, and 2) using a field-validated inventory dataset for those 560 HRGCs as input to the new APS model. Results showed that the predictions using the two different input datasets were statistically significantly different. HRGC hazard rankings from the two predictions as well as FRA's Web Accident Prediction System (WBAPS) were different from each other. Estimation of new zero-inflated negative binomial models using 5-year reported HRGC crashes and the two inventory datasets for the 560 HRGCs enabled model parameter estimate and marginal value comparisons showing differences in estimated coefficients' expected-magnitudes and average marginal effects. The conclusions were that erroneous and missing data in the unaltered FRA HRGC inventory dataset led to statistically different crash predictions compared to corrected and complete (field validated) HRGC inventory dataset and estimated crash prediction model parameters and their respective marginal values were different for comparative models based on the two different HRGC inventory datasets.