This study explored potential use of the traffic conflict-based surrogate safety assessment method as an alternative way of evaluating safety performance of roads and identifying potential sites for safety improvement. This study compared two major safety assessment streams (a statistical modeling method and a traffic conflict-based method) in assessing a crash risk to investigate the performance of the traffic conflict-based method as an alternative of the crash-based method in identifying hot-spots. The empirical Bayes method coupled with the safety performance function, called the EB-SPF method, was used as a benchmark, and the conventional crash frequency (CF) method was used as a comparison supplement: these two methods are viewed as the crash-based methods in that they rely on crash data. The traffic conflicts were estimated using the microscopic traffic simulation model, VISSIM. The safety evaluation was performed separately for 24 signalized intersections and 86 segments in Tysons Corner area, Virginia. The estimated safety measures from the three methods (i.e., EB-SPF, CF, traffic conflicts) were compared using Pearson correlation analysis, and hot-spot identification results were compared using the rank-based mean absolute error values. The results showed that the
Conflict-based method was found to have a fairly high correlation with a coefficient of 0.71 with the EB-SPF method in resulting outcomes and performed better than the crash frequency method in identifying hot-spots. Therefore, the conflict-based method can serve as a viable option for safety performance evaluation and hot-spot identification, especially when sufficient crash data are not obtainable.

Stichworte: Microscopic traffic simulation, surrogate safety measure, safety performance function, hot-spot identification

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