

**MODELING FREQUENCY AND SEVERITY OF PEDESTRIAN-VEHICLE
ACCIDENTS IN NEW YORK CITY**

By

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ABSTRACT

Safety is one of the primary issues of transportation. Ensuring the different users to perform their activities in a safety environment enables the sustainability of the transportation network. In urban areas, this becomes a complex problem, as vehicles interact with different modes of transportation, such as pedestrians, bicyclists and transit users. This interaction can result in an accident that causes the death or injury of pedestrians and drivers. Therefore, the study of pedestrian-vehicle crashes is of primary importance to ensure a safe environment for the users of the transportation system.

The use of crash-cause models that identify the affecting parameters is critical and has become exceptionally important for the most complex urban environments. This thesis focuses on pedestrian crashes in New York City and the specific characteristics that caused the fatalities and determined their level of injury. This study is the first in recent times to model pedestrian accidents in New York City. The study uses an extensive data set collected from several different sources over a period of five years that provide a rich source of independent variables for crash frequency and severity modeling. Different modeling methodologies are applied to estimate the parameters that affect the number of accidents and their level of injury. A simplified negative binomial, negative binomial with heterogeneity in dispersion parameter, and the zero-inflated negative binomial model is estimated to determine frequency of accidents. Additionally, a binary logit model is estimated to capture the factors affecting the level of severity of pedestrian crashes. Finally, important policy implications are drawn from the modeling results, and recommendations are made to reduce pedestrian risk in New York City. This are expected to reduce the risk of pedestrians through engineering measures, enforcement, ITS technologies, and educational and outreach programs. The results can be used as a guide to improve pedestrian safety in New York City and metropolitan areas with similar characteristics.