



D27 Sliding Distance Measurements and Their Role in Pedestrian vs. Vehicle Accidents

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Learning Overview: The goal of this presentation is to provide educational information concerning pedestrian accident reconstruction and the impact of documenting the physical evidence because analysis using less accurate measurements may change the cause of the collision and therefore affect potential liability of the party.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing the importance of physical evidence measurements and documentations in the liability process.

Pedestrian position relative to the vehicle determination in accident analysis often is an important factor to find the true cause of the accident and the liability process. In many accident cases, small derivations in primary parameters would affect the results and, thereby, the liable party dramatically. In many situations, the only elements remaining at the venue are final positions of the vehicle (if the vehicle has not been relocated prior to police officers arrival) and the pedestrian after the crash. One important element that is often not documented at the scene is the sliding distance of the pedestrian. Evaluating the remaining evidence, which could lead to measuring the sliding distance, can define the location of the pedestrian at the time of impact with the vehicle. Hence, often based on those elements, an adequate model can be utilized to reconstruct the accident and provide conclusions about the crash sequences.

There are multiple equations developed to investigate and analyze vehicle-pedestrian impacts. The majority of these calculations are focused on the total throw distance and the vehicle speed at the time of the impact. While those parameters play a significant role in reconstructing the accident scene, often the input parameters to properly calculate those values are not adequately available. One methodology that can often help to locate the position of the vehicle and the pedestrian relative to the roadways and relative to each other is measuring the sliding distance. Oftentimes, crucial measurements of the physical evidence that may provide a more accurate sliding distance are not documented by the investigator. By knowing the geometry characteristics of the vehicle and the pedestrian, and by applying the sliding distance, the launching velocity of the pedestrian can be calculated. This presentation uses a pedestrian vs. vehicle traffic fatality to explore the analysis using slide distance to calculate the total throw distance. Based on the sliding distance in the police report and using the road surface coefficient of friction measured at the site by the expert, the pedestrian's launch velocity was more accurately calculated. Subsequently, the vehicle impact velocity at the time of separation was calculated. As a result, by applying the vehicle range of speed at the time of impact and other parameters, such as the pedestrian launching height and launching angle, the total throw distance can be calculated. Since in many cases it is difficult to measure the total throw distance due to lack of physical evidence and locating the initial impact area relative to the roadways, calculating the total throw distance can play a significant role in identifying the liable party and who was at fault causing the accident.

Forensic, Accident Reconstruction, Pedestrian vs. Vehicle Collisions