Comprehensive Analysis of Factors Influencing Pedestrian Injury Severity at Intersection and Non-intersection Locations in Connecticut

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Center Name: New England University Transportation Center (NEUTC)

Research Priority: Promoting Safety

Principal Investigator(s): Dr. Anshu Bamney

Project Partners: University of Connecticut

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Project Description: This project analyzed Connecticut pedestrian crashes to determine what conditions were most associated with higher injury severity at intersections and non-intersection locations. The team linked crash records with vehicle information (VIN decoder and Canadian vehicle specs), grouped injuries into severity levels, and built models to compare patterns across settings. Key factors examined included speeding, lighting, roadway grade, traffic control, pedestrian actions, driver condition, and vehicle characteristics.

US DOT Priorities: The work supported U.S. DOT priorities to reduce roadway deaths and serious injuries by using data-driven methods to pinpoint conditions tied to more severe pedestrian outcomes. Findings informed practical countermeasures—such as speed management, lighting upgrades, and traffic control improvements—to help agencies prioritize safety investments where they would matter most.

Outputs:

- A cleaned, linked crash-vehicle dataset distinguishing intersection vs. non-intersection crashes and standardized injury-severity groupings.
- Statistical analyses identifying the strongest factors related to pedestrian injury severity.
- Clear, actionable factor lists (risk-increasing and risk-reducing) to guide countermeasure selection (e.g., speed control, lighting, traffic control).
- A final report summarizing methods, results, and recommended applications for planning and engineering.

Outcomes/Impacts:

- Risk rose at Non-intersections: pedestrian impairment, driver speeding, improper crossing, driver impairment, and unlighted roadways were associated with higher odds of severe injury; among severe cases, fatal-vs-serious risk increased with older pedestrian age and roadway up-grade.
- Intersections: speeding stood out as a major driver of severity; downgrade and unlighted conditions also raised risk.
- Where risk fell: traffic control devices at intersections showed protective effects (both passive measures like signs and active control like signals).
- Practical use: Results pointed agencies toward specific actions—targeted speed enforcement/traffic calming, lighting improvements at high-risk locations, attention to roadway grade effects, and installing or upgrading appropriate traffic control at intersections—to reduce severe outcomes for people walking.

Final Research Report: Final report is posted here: https://www.umass.edu/neutc/projects/examining-impact-land-use-transit-stops-roadway-and-demographic-factors-pedestrian-injury