10th University Transportation Centers Spotlight Conference: Pedestrian and Bicycle Safety

**Virginia Automobile and Bicycle Crash Safety Analysis**

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**GOAL**

Research aims to investigate **infrastructure, environment, traveler, and vehicle characteristics that affect bicyclist injury severity** in single automobile-bicycle crashes using a Virginia based crash dataset.

**DATA**

Data (N=3679) comes from **Virginia police crash reports collected between 2010 and 2014**.

**METHODOLOGY**

*Ordered probit* (OP) model is used in this study to analyze **bicyclist injury outcome categories**: Fatal (0), severe injury (1), minor/possible injury (2), no apparent injury (3), and no injury (4).

**RESULTS**

- Two of the most impactful factors identified via this study are the **influence of intoxication (in both bicyclists and drivers)** on bicyclist injury severity outcomes. The results show that biking while inebriated doubles the probability of severe injury for the cyclist and increases the probability of a fatality by 36.7%. Drunk drivers increase the fatality risk for cyclists more than any other factor studied. An intoxicated automobile driver increases the likelihood of fatal injuries for cyclists by five-fold (502.4%).
- Study also found **divided and one-way roads to be safer for bicyclists**. Crashes occurring on two way divided roads with or without a median and one way roads are less likely to result in fatalities, severe injuries, or minor injuries.
- Additionally, study results suggest that when **driver visibility was compromised, the probability of severe bicyclist injuries increased**. The study found roadway characteristics such as vertical grades and horizontal curves to be detrimental to the likelihood of severe injuries, possibly due to decreased sight distance before crashes, another component of visibility.

**FUTURE WORK**

- Some states have adopted **biking under the influence (BUI) laws** in an attempt to quell occurrences of biking while intoxicated. If effective, BUI laws could impact the one quarter of fatalities where alcohol is a factor. A counter argument, however, is that bicycling while intoxicated is almost definitively preferable to driving an automobile while intoxicated, where the potential to endanger other people is much greater. This research indicates that further examination of BUI laws and their effectiveness may be warranted to determine their safety impact.
- Laws designed to prevent DUIs are already in effect, but it may be beneficial to improve education about the **impacts drunk drivers pose** not just to themselves and other automobiles, but to **particularly vulnerable road users like bicyclists**. This may also further the case for separated bicycle lanes, to reduce the potential for conflict between automobiles and bicyclists.