Econometric Analysis of Bicycle Accident Severity & Intersection Risks, Sydney

Asif Ahmed[1], Chinh Ho[2], Fiona Campbell[3], Ingrid Bissaker[4]

Abstract: This paper analyses bicycle accidents, their severity, and underlying causes within the City of Sydney local government area. A particular focus is given to crashes related to left- and right-turning vehicle movements at intersections and the potential influence of bike lanes on these incidents. This study advances traditional descriptive analysis by developing an econometric model to examine the factors influencing the degree of crash (DC) and road user movement (RUM) in traffic accidents across Sydney streets. Historical crash data from the Centre for Road Safety within Transport for NSW, dating back to 2009, has been utilised. Five crash severity levels—fatal, serious injury, moderate injury, minor injury, and non-casualty (tow-away)—are examined in relation to both primary and secondary parties involved. An ordered probit model will be employed to account for unobserved effects that cannot be captured through traditional traffic surveys. The study's findings will offer policy recommendations based on model estimations to enhance cycling safety and intersection design.

Keywords: Ordered probit model, degree of crash, road user movement, intersection safety, bicycle accidents

[1] Transport Planner, City of Sydney E: aahmed2@cityof Sydney.nsw.gov.au
[2] Associate Professor, ITLS, The University of Sydney E: quoc.ho@sydney.edu.au
[3] Manager Cycling Strategy, City of Sydney E: fcampbell@cityofsydney.nsw.gov.au
[4] Senior Transport Planner, City of Sydney E ibissaker@cityofsydney.nsw.gov.au