

Vehicle-bicycle interaction at roundabouts

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ABSTRACT

The paper aims at modeling drivers yielding behavior towards cyclists at roundabouts. A vehicle-bicycle conflict takes place before a yielding event can be observed hence methodological framework was developed to describe the decision process of a yielding event. A hierarchical Logit model was developed with two levels. The first level estimates the probability of conflict which was modelled as a hidden state. The second level estimates the yielding probability, given that a conflict has occurred. Interaction zones were established and defined as zones where vehicles and bicycles began to interact (For vehicles and bicycles 10 and 30 m respectively). The parameters were estimated by maximum likelihood approach. The results showed that drivers' yielding behavior was negatively correlated with the speed of the vehicle (i.e., the higher the speed of the car was, the lower the yielding probability). The bicycle speed was found positively correlated to the yielding probability. In other words, the higher the bicycle speed was, the higher the yielding probability.

Keywords: vehicle-bicycle interaction, yielding behavior, conflict, Logit model, decision process, roundabout.