Prediction of Severe Traffic Accident Rates at Roundabouts Using Artificial Neural Networks

By

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ABSTRACT

Roundabouts are being acknowledged to be a viable alternative to the other types of at-grade intersections. A growing attention for implementing roundabouts is due to their distinct advantages, which they offer with respect to safety and smooth traffic movement especially for moderate levels of traffic flows. The improved visual aesthetics of intersection by landscaping and/or providing some art features adds another advantage.

With the increasing awareness of viability of roundabouts as an alternative to other forms of intersection control, there exists a need to enhance designers and engineers’ knowledge about the proper techniques and the influence of different design characteristics on the safety and performance of roundabouts, since these characteristics play an important rule in the enforcement of drivers to reduce their speeds when approaching the roundabout and affect the impact angles between the conflicting streams.

This research will focus on the development of prediction model for severe accidents at roundabouts by relating the available geometric, traffic characteristics with the accident records. The research will utilize the Artificial Neural Network technique (an artificial intelligence approach) in developing the model.

The development of such model will enable the highway design engineers to understand the influence of different geometric and traffic characteristics on safety especially in critical cases when the available resources and the safety to be compromised. The model will provide a tool to evaluate alternatives and adopt the most feasible one when the roundabout is one of these alternatives.