

VISSIM Modeling of Driver Behavior at Connecticut Roundabouts

Authors : F. Clara Fang, Hernan Castaneda

Abstract : The Connecticut Department of Transportation (ConnDOT) has constructed four roundabouts in the State of Connecticut within the past ten years. VISSIM traffic simulation software was utilized to analyze these roundabouts during their design phase. The queue length and level of service observed in the field appear to be better than predicted by the VISSIM model. The objectives of this project are to: identify VISSIM input variables most critical to accurate modeling; recommend VISSIM calibration factors; and, provide other recommendations for roundabout traffic operations modeling. Traffic data were collected at these roundabouts using Miovision Technologies. Cameras were set up to capture vehicle circulating activity and entry behavior for two weekdays. A large sample size of filed data was analyzed to achieve accurate and statistically significant results. The data extracted from the videos include: vehicle circulating speed; critical gap estimated by Maximum Likelihood Method; peak hour volume; follow-up headway; travel time; and, vehicle queue length. A VISSIM simulation of existing roundabouts was built to compare both queue length and travel time predicted from simulation with measured in the field. The research investigated a variety of simulation parameters as calibration factors for describing driver behaviors at roundabouts. Among them, critical gap is the most effective calibration variable in roundabout simulation. It has a significant impact to queue length, particularly when the volume is higher. The results will improve the design of future roundabouts in Connecticut and provide decision makers with insights on the relationship between various choices and future performance.

Keywords : driver critical gap, roundabout analysis, simulation, VISSIM modeling

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