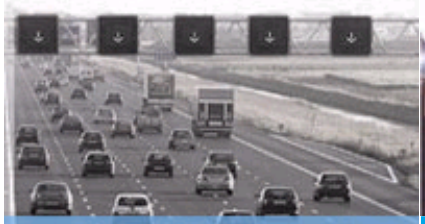

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Evaluation of the Waiting-Time effect on Critical Gaps at Roundabouts by a Logit Model

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Abstract

Several studies have suggested that the entry capacity of roundabouts depends on the critical gap. Accordingly, the assumption in calculating the capacity is that all drivers are homogeneous and consistent; i.e., their behavior does not change over time. This paper examines the accuracy of this assumption; in particular, it evaluates the effect of waiting times on drivers' critical gaps.

The paper presents a new behavioral approach to estimate the impact on critical gaps of waiting time prior to entry into a roundabout. A disaggregate logit model is developed to study the effect of waiting time at an approach to a roundabout on the likelihood of accepting different gaps and, therefore, on the critical gap.

The estimated model showed that the waiting time has a significant effect on the critical gap, particularly on gaps in the range of 2 to 5 seconds. The importance of this model is that it shows quantitatively the reduction in the critical gap with the increase in waiting time. Therefore, roundabout capacity for this range of critical gaps is higher than that currently proposed by the Highway Capacity Manual (HCM 2000).

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