

GAP Acceptance of Crossing Pedestrians at Urban Unprotected Mid- Block Crosswalks in Divided Highways

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Abstract

Unprotected mid-block crosswalk is a hazardous location for pedestrians. In order to fulfil the crossing action at mid-block crosswalks in divided highways, the pedestrian must accept two gaps. The primary objective of this research is to find out whether there exists any significant difference between these two accepted gaps. Video footage was collected at an unprotected mid-block crosswalk located in a two-lane two-way divided dual carriageway. The data was extracted using an image processing software. Hypothesis testing was performed. The paired t-test results show that there is no significant difference between the two mean accepted gap values of the two crossing actions. The secondary objective was to develop a gap estimation model for an unprotected crosswalk in a divided highway. The effective gap was selected as the dependent variable to fit the model as there is no significant difference between the two gaps. Thus, multiple linear regression model was fitted in order to estimate the gap acceptance with pedestrian characteristics and vehicle stream characteristics. Gender, age, crossing point, waiting time, and crossing speed were selected as pedestrian characteristics while vehicle type and lane number were selected as vehicle stream characteristics. R statistical software was used for the model analysis. The regression model was developed with significant variables; gender and vehicle type. The results showed that females are accepting higher gap than males when crossing the crosswalks as an example, female pedestrian accepts 12.3sec gap when male pedestrian's acceptance gap is 9.46sec. When considering vehicle type, as an example pedestrian's acceptance gap is higher when the heavy vehicles were oncoming. The findings of this study can be useful for traffic planning work whilst assuring the safety of both pedestrians and drivers.

Keywords: *Unprotected mid-block crosswalks, Divided highways, Critical gap, Crossing pedestrians*

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