

Evaluation of Before and After Measures to Curb Distracted Walking Technology Transfer Activities

by

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TECHNOLOGY TRANSFER ACTIVITIES

1 Summary of Research Study and Findings

In this study, the warning traffic signs as countermeasures to distracted pedestrian walking behavior were investigated by shortlisting several types of measures to curb distracted walking. The measures included a message posted on a sign and pavement painting on walkways/pathways and pedestrian crossing at signalized urban intersections. Furthermore, four pedestrian safety signs were designed, and user acceptance was measured. The study analyzed the before and after observations and identified how effective the measures were in reducing distracted walking. The following are the major summaries of this study:

- After designing four pedestrian safety signs, a survey was undertaken to determine the perception of pedestrians about the effectiveness of these four safety signs on the reduction of distraction while walking. Survey results show that the highest number of pedestrians ranked safety sign A as excellent.
- VISSIM microscopic simulation software was used to develop a T-signalized intersection to see distracted and non-distracted pedestrian behavior in terms of average speed and the crossing time of walkways.
- The simulation analysis shows that the walking speed of the pedestrian increases, and the travel time decreases with the increase of τ value, a parameter of walking behavior in VISSIM VisWalk. However, a substantial impact on the travel time and walking speed were observed for increasing τ value from 0.05 to 0.2. The further impact with an increased τ value was not significant enough.
- The simulation results show that the average speed of distracted pedestrians is 2.87 ft/sec or 0.9 m/s and for non-distracted is 3.29 ft/sec or 1 m/s.

2 Outputs

At the end of the study, the research goals were accomplished. We are planning to disseminate research results through conference presentations and publish a journal article shortly. Below is the outline plan to disseminate the research results.

2.1 Accomplished Outputs

C²M² Report

Samia Akter; Judith L. Mwakalonge; Jae Dong Hong; Gurcan Gomert; Isa Musa; and Md Mahmud Hasan Mamun (2021). *Evaluation of Before and After Measures to Curb Distracted Walking*. Center for Connected Multimodal Mobility (C²M²) Tier 1 University Transportation Center (UTC), USDOT.

Journal Article under Review

The team is addressing reviews comments on one journal article titled "*Evaluation of Before and After Measures to Curb Distracted Walking*" and will resubmit it for journal publication.

Conference Article Presentation

Akter, S., Mwakalonge, J.L., Hong, J.D., Gomert, G., Musa, I., Mamun, M.H. "*Evaluation of Before and After Measures to Curb Distracted Walking*", Transportation Research Board Annual Meeting, January 5-15, 2021.

2.2 Future Output

Peer-Reviewed Journal Article

Currently, we are planning to expand the research by doing a field experiment using safety signs, which were ranked as excellent among pedestrians during the survey. Also planning is done to expand the study on unsignalized intersections to determine the impact of distraction.

Conference Poster and Podium Presentation

For any additional work, we plan to present our research at the TRB annual meeting and the UTC conference as well as other conferences, e.g., the Road Safety Simulation conference.

Transportation Practitioners Comments

None

3 Outcomes

The research has produced the following critical outcomes:

3.1 Survey-based Outcome

A survey undertaken to determine the perception of pedestrians about the effectiveness of the four safety signs on the reduction of distraction while walking showed that the highest number of pedestrians ranked safety sign A as excellent. The design will help transportation agencies, public officials, and enforcement agencies install effective measures to reduce distracted walking to enhance the safety of all road users.

3.2 Simulation-based Outcome

The team utilized the VISSIM microscopic simulation software to develop a T-signalized intersection and observed distracted and non-distracted pedestrian behavior in terms of average speed and the crossing time of walkways. From the simulation analysis, the walking speed of the pedestrian increases, and the travel time decreases with the increase of τ value, a parameter of walking behavior in VISSIM VisWalk. Also, the simulation results show that the average speed of distracted pedestrians is 2.87 ft/sec or 0.9 m/s and for non-distracted is 3.29 ft/sec or 1 m/s. The outcomes of this research provides vital information to the public on the negative impacts of distracted walking on walking safety.

4 Impacts

We expect this study to add safety knowledge to the transportation community and the public. We anticipate that this research to have an impact on the safety measures implementation related to distracted walking as follows:

- (i) *Transportation agencies, enforcement agencies, and public officials:* In safety measures implementation, the high pedestrian ranked safety sign, walking speed, and walking behaviors studied can be utilized to install proper distracted walking signs.
- (ii) *Transportation professionals:* Analysis shows that the average speed of distracted pedestrian is 2.87 ft/sec or 0.9 m/s and for non-distracted is 3.29 ft/sec or 1 m/s, which support a previous study (Sobhani & Farooq, 2018).