

JOINT TRANSPORTATION RESEARCH PROGRAM

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Sponsor: Indiana Department of Transportation, 765.463.1521

SPR-4301

2021

Assessment of a Displaced Pedestrian Crossing for Multilane Arterials

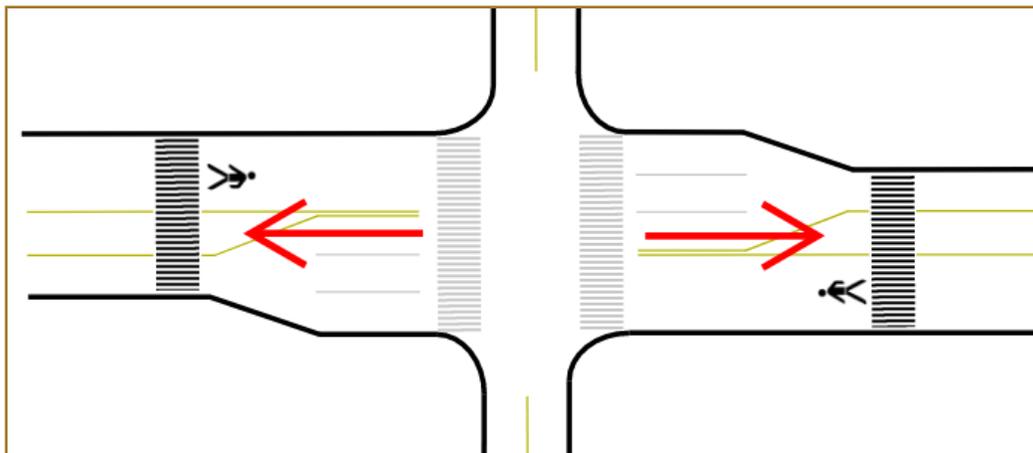
Introduction

This research investigates the operational benefits of a displaced pedestrian crosswalk to traverse multilane arterials. Pedestrian crosswalks at large intersections may be challenging due to the need for pedestrian safety and efficient operation, including vehicle and pedestrian delay and corridor signal progression. Long crossing distances, high traffic volumes, the potential for turning traffic from multiple directions (right turns on green, right turns on red, and permissive left turns) and the increased speed of turning traffic due to a larger turning radius may all reduce pedestrian safety. Pedestrian safety concerns may be exacerbated if pedestrian volumes are low, and motorists are not expecting pedestrian traffic.

At large intersections where pedestrians must cross a multilane roadway, concurrent pedestrian service, in which the pedestrian movement is served

simultaneously with the adjacent through movement, may significantly extend the cross street green time, increasing intersection delay for both vehicles and pedestrians and negatively affecting vehicle progression on the arterial.

The objective of this research project is to assess the feasibility of an innovative strategy for the provision of pedestrian service across multilane arterials. This project studies the potential for a “displaced” pedestrian crossing that is physically displaced and relocated upstream and/or downstream of the intersection. A displaced crossing may provide advantages to pedestrians, including a reduced crossing distance and an increased sense of safety due to the reduced impact of turning traffic. A displaced crossing may also provide advantages to motorists, including a shorter pedestrian interval, a shorter cycle length, reduced delay, and fewer potential conflicts with pedestrians. Research has also suggested that driver compliance is very high for



Displaced crosswalk eliminates conflicts between pedestrians and turning vehicles.

a pedestrian hybrid beacon (PHB), which is one signal alternative for a displaced pedestrian crossing.

Findings

The proposed pedestrian displaced was investigated using four intersection locations in Indiana. At each intersection, vehicular and pedestrian volumes were entered into the Highway Capacity Software (HCS 7) to obtain appropriate signal phasing and timing plans for the “as-is” scenario with concurrent pedestrian service. Each intersection was then simulated using PTV Vissim 11 to obtain levels of service (LOS) based on the delay to vehicles and travel time for pedestrians for three configurations: (1) the as-is configuration with concurrent pedestrian service, (2) a displaced configuration with a coordinated PHB, and (3) a displaced configuration with two-stage midblock coordinated PHB. The vehicle delay and the pedestrian travel time vary based on intersection characteristics such as pedestrian volume, turning volume, and effective green time distribution to phases.

Implementation

Generally, a displaced pedestrian crossing is expected to provide benefits, including reduced vehicle delay

and the elimination of pedestrian conflicts with turning vehicles. This research provides compelling evidence that designers should consider a displaced pedestrian crossing when designing new intersections or modifying existing corridors. Additional research is recommended to confirm the operational benefits in an actual field study and to document the rate of driver compliance with the requirement to yield to pedestrians. As with any change in traffic control, new installations may require an educational campaign to ensure compliance and safety.

Recommended Citation for Report

Nafakh, A. J., Zhang, Y., Hubbard, S., & Fricker, J. D. (2021). *Assessment of a displaced pedestrian crossing for multilane arterials* (Joint Transportation Research Program Publication No. FHWA/IN/JTRP-2021/16). West Lafayette, IN: Purdue University. <https://doi.org/10.5703/1288284317318>

View the full text of this technical report here: <https://doi.org/10.5703/1288284317318>

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Crosswalk on Purdue University's West Lafayette campus.

