MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 24-550 (project 693) | August 2024

Pedestrian Safety and Traffic Operations Near Transit Stops

the ISSUE

Pedestrian injuries and fatalities continue to increase, with a recent report indicating a 75% increase since 2010. Pedestrian fatalities represent almost 18% of all traffic deaths. The majority of pedestrian fatalities occur on non-freeway arterials that may be difficult to cross except at signalized intersections. Previous research has shown that pedestrian crashes are more frequent at intersections with transit stops.

the RESEARCH

This research project's objective was to investigate the impacts of transit stop location (near-side versus far-side) on pedestrian safety and traffic operations at intersections. Three different video-based behavioral observation data collections at signals in Utah were utilized to study: (1) transit stop events (interactions between transit vehicles and other vehicles) and transit rider crossing behaviors and vehicle conflicts, (2) pedestrian conflicts with right-turning vehicles (conflict severity, driver/pedestrian reactions), and (3) pedestrian crossing behaviors (crossing location, crossing behaviors). These outcomes were then statistically compared for near-side versus far-side transit stop locations.

the FINDINGS

For public transit operations, arrival delays and impacts were more likely and more severe at near-side stops, but departure delays were much more likely and impactful at far-side stops. Transit vehicles delayed other vehicles much more often and more significantly at near-side stops, whereas more passing was observed at far-side stops. This suggests that far-side transit stops are better for general traffic operations. Results for public transit operations are more equivocal, but actions can be taken to improve transit operations at far-side stops including construction of curb extensions to make in-lane

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Project Title

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the **FINDINGS** cont.

far-side stops, or enacting and enforcing laws requiring overtaking vehicles to yield to transit vehicles entering traffic while a yield sign on the transit vehicle is flashing.

Evidence pointed toward far-side transit stops being worse for pedestrian safety. Specifically, conflicts at far-side stops were more severe, with less time between when pedestrians and vehicles were at the same point. Also, drivers were less likely to slow down or stop for pedestrians at far-side stops. There was slightly more evidence suggesting that more pedestrians cross mid-block near far-side transit stops than evidence that more pedestrians cross mid-block by near-side transit stops. These results suggest that adverse safety outcomes at far-side transit stops may be affected by both pedestrian and driver behaviors and actions.

This raises a conundrum: What should be done if far-side transit stops are better for traffic operations, but are worse for pedestrian safety? There are two possible approaches. First, implement strategies such as using curb extensions and tighter corner radii to control vehicle speeds, or using traffic signal timing/phasing to provide more protected pedestrian crossing movements. Second, prioritize pedestrian safety over traffic operations, and recommend near-side transit stops in certain situations. A combination of both approaches, tailored to unique situations, may be the best ultimate recommendation for improving both traffic operations and pedestrian safety through transit stop placement.

the **IMPACT**

This research offers recommendations about improving both pedestrian safety and traffic operations at signalized intersections with near-side and/or far-side transit stops by using both stop location and intersection/stop design and operations. By carefully considering the safety and operational trade-offs in each situation – and deciding the relative priority of safety and operational outcomes – agencies can hopefully improve pedestrian safety while ensuring efficient transit and traffic operations.

The findings and recommendations of this research are being communicated to transportation stakeholders in Utah, including the Utah Transit Authority and the Utah Department of Transportation. Insights may be used to reconsider the design and/or placement of transit stops near intersections.

For more information on this project, download the Main report at https://www.ugpti.org/resources/reports/details.php?id=1207

For more information or additional copies, visit the Web site at www.mountain-plains.org, call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.