Florida Department of Transportation Research

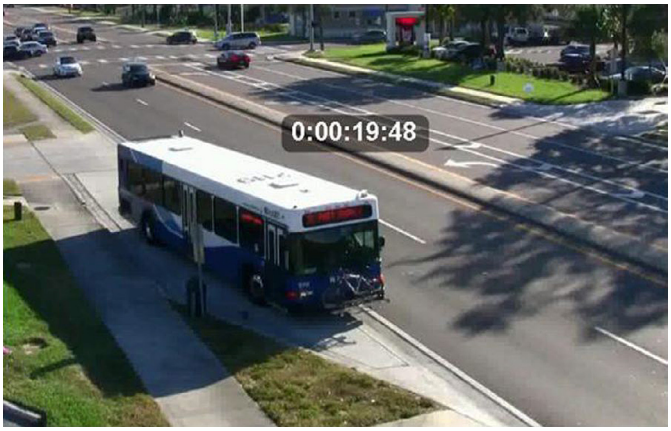
Recommendations for Yield-to-Bus Traffic Control Devices and Bus Pullout Bays Design Characteristics
BDK85 977-33

Bus pullout bays are being installed increasingly on Florida's roads as a safety factor and so that stopped buses do not impede traffic. In Florida, state law requires car drivers to yield to buses when a bus needs to reenter the roadway after a stop; yielding to the bus is important to helping it maintain a schedule. However, many drivers do not yield to the bus under these circumstances.

University of South Florida researchers examined bus and driver behaviors at bus pullout bays in Hillsborough and Lee counties. The researchers had three objectives: identify critical design features and conditions that affect safety of buses merging into traffic from bus pullout bays; design a set of roadside treatments or traffic control devices to promote yield-to-bus (YTB) behavior at bus pullout bays; and recommend YTB traffic control devices for implementation and evaluation on state roads.

The researchers first examined selected bays to determine their precise geometry and interaction with adjacent lanes, which play an important role in the safety and operational effectiveness of bus pullout bays. The number of lanes influences whether an approaching vehicle can safely change lanes to avoid a decelerating bus moving into the bay or a bus emerging from the bay into the traffic lane. The length of the pullout bay influences how much the bus must decelerate in the traffic lane and the reentry speed the bus can attain when leaving the bay. The researchers developed a spreadsheet to calculate the bus's reentry speed.

In the field, the researchers installed a high-definition video camera on top of a 25-foot mast. Video from the camera was relayed to a nearby surveillance van. Researchers reviewed video of numerous bus-car interactions. Bus maneuvers and cars responses were categorized and scored. Reentry times were calculated from these observations; safety factors and car-bus interactions were noted.



Researchers used video to document and time bus reentry maneuvers.

The researchers then examined interventions to improve YTB behavior, including marking the bus or the road, installing signs, or using lighted signals. The precise combinations of elements, their configuration, and sign language are all factors that must be considered in light of research into how drivers may respond to a specific design element. Much research has been done on this topic, and the researchers used this work to develop a number of designs that were then reviewed by state and district traffic operations engineers and the Florida Department of Transportation sign specialists. Two designs were selected as most recommended.

In addition to signage, researchers recommended a flashing signal to be displayed to approaching traffic. The signal would be activated by sensors that could detect the presence of the bus in the bay. Such a device can be constructed with off-the-shelf parts, and therefore, is more economical to implement than a custom-built system.

Proper signage and signaling can help ensure the efficiency and usefulness of transit systems, which become more important as municipalities become more reliant on buses as a means of reducing the number of vehicles on the road and improving environmental conditions.

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For more information, visit http://www.dot.state.fl.us/research-center