



Florida Department of Transportation Research Aging Road User Studies of Intersection Safety: Lab and Simulator- Based Studies of Crosswalk Markings and Flashing Yellow Arrow Com- prehension – Phase 2 BDV30-977-04

Nearly half of all traffic-related fatalities occur at intersections, so engineering intersections for greater safety remains a priority for the Florida Department of Transportation (FDOT). “Engineering” in this case must take into account the abilities of various ages of drivers as well as aspects of human behavior, such as speeding up or slowing down when nearing a yellow traffic signal.

In this project, researchers from the Florida State University psychology department studied both pedestrians and drivers and their interactions with intersections using driving simulators and field observations. The areas studied were special emphasis crosswalks, reaction time to yellow signals, and flashing yellow left-turn arrows.

The project focused on the abilities of older adults to support the Department’s Safe Mobility for Life Program. Florida has both significant aging populations and one of the highest rates of pedestrian fatalities in the nation. The researchers conducted studies with three age groups: ages 21 to 35; ages 50 to 64; and age 65 and older.

The first task focused on driver and pedestrian responses to standard crosswalks versus special emphasis crosswalks. Using a simulator, participants drove courses with different types of crosswalks. Researchers addressed several issues: do drivers perceive special emphasis crosswalks more readily than those with standard markings; is pedestrian crossing behavior different at special emphasis crosswalks – studied in the field and with pedestrian surveys; does crosswalk type influence whether drivers notice pedestrians – studied by using an eye-tracking device with participants in simulated traffic situations and measurements of brake reaction times.

In the second task, the duration of a yellow traffic signal was examined in relation to the perception-response time of both younger and older adults. Crashes with cars and/or pedestrians can occur when drivers run a red light either attempting to



Special emphasis crosswalk (ladder crosswalk) with pedestrian in a simulated view from 50 feet.

“beat the light” or because they were unable to respond in time to stop. In this study, participants in three age groups drove a simulated course, and researchers measured their travel speed and the time between when the yellow signal was activated and when the participant reported seeing it. These data were correlated with age group and length of signal timing.

In task three, driver responses and understanding of the flashing yellow arrow (FYA) left turn signals were studied. The FYA has been shown to generally improve intersection safety, but few older adults were included in previous studies. This task focused on whether the FYA is quickly and easily understood by drivers of all ages and whether their understanding was increased through their review of FYA educational materials. The researchers again asked participants in three age groups to drive a simulated course and recorded drivers’ accuracy and speed of response.

These human factors studies improved researchers’ understanding of the behavior of drivers and pedestrians of all ages, which is critical for developing safety countermeasures that will have the intended effect of reducing crash injuries and fatalities.