Research Spotlight

Older Drivers' Behavior at On-Ramp Merging Areas

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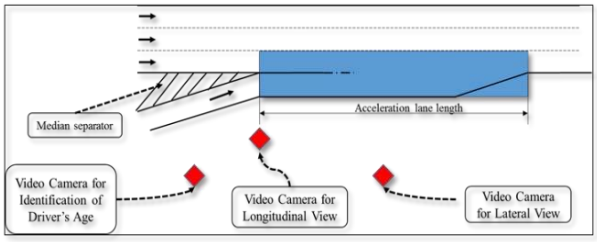
Background

Freeways can pose challenges to aging drivers due to high posted speed limits compared to arterial and collector roads. Merging into the mainline traffic is one of the most challenging driving maneuvers on the freeways, and freeway traffic is often heavy and moving fast. The pressure of adjusting speeds to match the mainline traffic speeds, especially on shorter acceleration lanes, is challenging for drivers, particularly if an eager driver in a following vehicle wants to merge quickly and is following too close. These challenges are further heightened for older drivers who have longer perception-reaction times, larger acceptance gaps, and are recognized to have slower acceleration rates due to cognitive, behavioral, and health limitations.

The merging behavior of aging drivers at freeway on-ramps needs to be evaluated to quantify the differences between the aging driver population and younger drivers to better understand how the operational characteristics of such facilities are affected by the interaction of different driver age groups.

Research

This study, based on field observations, examined the driver merging behavior by evaluating three traffic measures – gaps, merging location, and ramp approach speed. Also, the analysis investigated the behavior of different age groups, with a special focus on older drivers (65 years and older). Two sites along the Interstate 75 in Southwest Florida, with a considerable high aging population were used as a test bed for this study.



Findings

The study revealed that the merging position appears to be significantly influenced by driver age on both sites at 90% confidence level. Older drivers were observed to merge more at the end of acceleration lane, whereas younger drivers tend to merge earlier, near the beginning of the acceleration lane. However, vehicle approach speed for ramp vehicles appeared to have no correlation with the merging position on either site at 95% confidence level. The gap size, however, appeared to influence the merging position of vehicles. The influence of gap size at both on-ramps suggests that regardless of age, if a larger gap size is available, most drivers would tend to merge early, and vice versa.

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