

Research Spotlight

Project Information

REPORT NAME: Evaluation of Michigan's Engineering Improvements for Older Drivers

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New signs and signals make roads safer for older drivers

The aging of Michigan's population has resulted in an increase in the number of older drivers involved in traffic collisions. The number of drivers age 65 and older involved in crashes in Michigan increased by 2.4% from 2004 to 2013, even as the number of all drivers involved in crashes dropped by 23.8% during that time.



Improvements intended to improve safety for older drivers include (top) signage with the Clearview font and arrow-per-lane signing and (from bottom left) fluorescent yellow sheeting, pedestrian count-down signals and box-span signal configuration.

Problem

In 2004, Michigan DOT began a program to implement engineering countermeasures addressing the needs of older drivers, after a successful demonstration at the North American Conference on Elderly Mobility Best Practices from Around the World.

Now that the improvements have been in place for several years, MDOT

wanted to evaluate them to ensure that they are having the intended effect and to quantify both the safety impacts and the cost-effectiveness of the improvements.

Research

The five improvements that MDOT began implementing in 2004 were:

- The use of **Clearview** font on guide signs.

“The benefit-cost ratio for all of these previously used devices was very good, and some were exceptional. This research confirms that the improvements MDOT started making 11 years ago for older drivers were wise investments that we should continue implementing.”

Kimberly Lariviere, P.E.
Project Manager

Clearview font has more open interior spaces in its letters than the traditional Series E Modified highway font, and is intended to improve legibility by minimizing halation, a blurring effect that can occur around the edges of the letters.

- The use of **fluorescent yellow sheeting**, a new color for warning signs that is more visible. In addition, the material selected is brighter than other types of yellow sheeting.
- **Box span signal configuration**, in which traffic signals are suspended along all four sides of an intersection, to improve visibility (and potentially reduce red-light running), rather than being suspended from cables running diagonally across the intersection.
- **Pedestrian countdown signals**, which show the number of seconds remaining to safely cross the roadway. These signals help pedestrians decide whether to start crossing an intersection or adjust their walking speed.
- **Arrow-per-lane signing**, which clarifies navigation paths with a directional arrow above each limited access highway lane. Researchers evaluated these improve-

ments in two ways. First, they conducted a survey of 1,590 Michigan drivers and pedestrians in Detroit, Grand Rapids, Kalamazoo and Lansing to learn their perceptions of the improvements. Then, they analyzed historical crash data, before and after implementations, to determine the impacts of the improvements on safety.

Results

For the most part, drivers preferred the improvements over the traditional alternatives. About 90% of survey participants preferred pedestrian countdown signals and found them helpful in deciding whether to start crossing an intersection and in adjusting their walking speed. More than 70% preferred signs printed on fluorescent yellow sheeting, and nearly 80% found them more visible in bad weather or at night. Approximately eight out of ten preferred arrow-per-lane signing, and about six in ten preferred the Clearview font.

All five of the improvements reduced crash rates cost-effectively, both specifically among older drivers and among all drivers. The Clearview font and fluorescent yellow sheeting were installed together in many cases, and the combination reduced crashes by 24% on freeways, 30% on urban non-freeways, and 33% on rural non-freeways. With a low cost of installation, \$87 per sign more than Series E Modified highway font and high-intensity sheeting, these measures combined for a benefit-cost ratio ranging from \$1,090 to \$7,456 for every dollar spent, depending on the type of location installed.

Arrow-per-lane signing reduced overall crashes by 42%, and crashes among drivers 65 and older by 68%, producing \$1,440 in benefits for every dollar invested. However, arrow-per-lane signing has not yet been installed in many sites in Michigan, so evaluating again when there are more sites to review may be justified. Pedestrian countdown signals significantly reduced crashes involving pedestrians.

They also led to a reduction in crashes that only involved vehicles. Box span signals had the smallest impact on collisions, but even they produced \$13 in safety benefits for every dollar invested.

Value

This project confirms that all five of the improvements studied provided good safety benefits for the amount of money invested, and several produced exceptional benefit-cost ratios. Researchers recommend continuing to install them in appropriate locations.

A follow-up research project is examining the characteristics of sites where crashes involving older drivers are most likely to occur to determine if the improvements are being installed in the locations where they can have the greatest impact.

Research Administration

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