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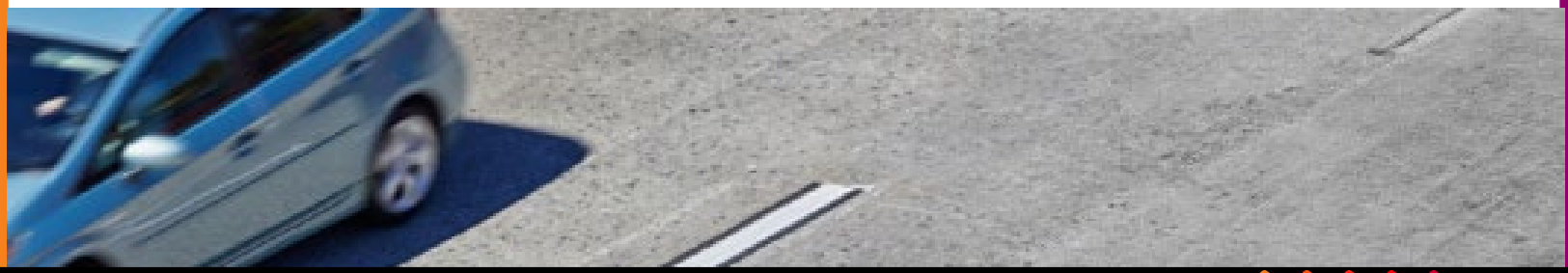


Higher Contrast Markings Make for Safer Driving

Higher Contrast Markings Help Make Driving Safer

Lane departure crashes account for roughly 50 percent of fatal roadway crashes (FHWA 2023), but the use of contrast pavement markings (CPM) could help reduce such crashes by up to 44 percent according to recent studies (Williamson and Lin, 2023).

To determine the impact of road markings like CPMs, highway safety professionals conduct studies measuring the crash reduction potential of various types of safety improvements. They track crashes "before" implementation of a road marking against crashes "after" implementation. The measured change in crashes is used to develop a crash modification factor (CMF). A CMF is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site (Williamson and Singh, 2024).

New Research, Consistent Results

Research conducted by Michael Williamson and Sumit Singh on behalf of the Illinois Center for Transportation evaluated data provided by six state departments of transportation across the country, including on four, six, and eight-lane roadways.

“The results indicate a positive effect with the use of contrast pavement markings, with all roadway types and crash severity levels showing a decrease in crashes,” Williamson and Singh write.

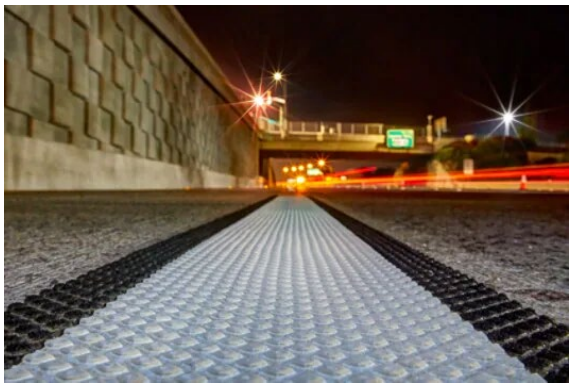
The precise figures in their study range from a crash modification factor (CMF) of 0.95 (Williamson and Lin, 2023), for property damage only crashes on eight-lane roadways, up to a CMF of 0.71 for all crash types on eight-lane roadways. CMFs better than 0.90 were recorded for all other crash type/lane count configurations with sufficient data, except for the fatal/injury crash rate on six-lane roadways where the CMF was 0.93 (Williamson and Singh, 2024).

This study controlled for the number of lanes, lane width, and other roadway design features that are known to influence safety by using similar locations. Williamson and Singh also carefully parsed the data they were provided to include only lane departure crashes and excluded any crash where the likely cause was due to “underlying factors, such as extreme weather, including snow and ice.”

Williamson and Singh's work was the first substantial study of its kind, but Williamson, and colleague Ping Lin, backed it up in 2024 as they evaluated Indiana specific data as part of a joint effort between the Indiana Department of Transportation (DOT) and Purdue University.

In that study, Williamson and Lin found even higher CMFs attributable to contrast pavement markings (Williamson and Singh, 2024). They also evaluated whether there was a difference between bordered centerline markings and lead/lag markings with bordered edge lines.

"The installation of contrast markings in Indiana suggests a decrease in roadway departure crashes of 42 percent for bordered centerlines and a 44 percent decrease for lead/lag with bordered edge lines. The results suggest a slightly better benefit than the national level, it should be noted that the national level CMF was developed with data from multiple states and a larger crash database." (Williamson and Singh, 2024).



Benefits Greatly Outweigh the Costs

Surveys throughout the years have found that state DOTs are steadily adopting contrast pavement markings. In 2002, eight out of 35 state DOTs that responded to an AASHTO survey were using CPMs, whereas a 2006 survey by the Texas Transportation Institute found that 21 out of 35 responding DOTs had adopted the use of CPMs (Smadi and Hawkins, 2023).

In 2023, Omar Smadi and Neal Hawkins found that the number of DOTs using CPMs had expanded to 35 out of the 45 responding DOTs (Smadi and Hawkins, 2023).

DOTs concerned about the cost-effectiveness of contrast pavement markings may find reassurance in reviewing Williamson and Singh's study. Not only did they find that "the benefit-cost ratio was found to be greater than one for all examples tested," they also built a cost-benefit worksheet to estimate their return on investment (ROI) for departments considering the implementation of CPM for future projects. The cost-benefit calculation is based on the specifications of the road itself, the road's crash history over the past few years and the costs of materials and installation for the proposed project.

The potential of CPMs to help provide safer roads highlighted in these studies combined with Williamson and Singh's project evaluation tool suggests a bright future for road safety. Additionally, integrating all-weather, wet-reflective CPMs like 3M™ Stamark™ All Weather Tape Series 380AW can help enhance the ability to bring more people home safely.

References

Williamson, M., and Singh, S., Illinois Center for Transportation. (2024, August). Crash Modification Factors for Contrast Pavement Markings on Light-Colored Pavement. https://doi.org/10.36501/0197-9191/22-010.

Williamson, M., and Lin, P., Joint Transportation Research Program. (2023, October). Effectiveness of contrast markings on roadways and orange markings in work zones. https://nationalacademies.us10.list-manage.com/track/click?u=4f1f5aad1cdf8802c08a457cb&id=39ad9bc332&e=087fa0cd34.

Smadi, O., Hawkins, N., National Academies of Sciences, Engineering, and Medicine. (2023). Contrast Pavement Markings Practices. https://doi.org/10.17226/27284.

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