

Design and Evaluation of a Prototype Rear Obstacle Detection and Driver Warning System

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[Robert E. Llaneras](#) Westat, Inc., Rockville, Maryland

[Charles A. Green](#) General Motors Corp., Warren, Michigan

[Raymond J. Kiefer](#) General Motors Corp., Warren, Michigan

[William J. Chundriik Jr.](#) General Motors Corp., Warren, Michigan

[Osman D. Altan](#) General Motors Corp., Warren, Michigan

[Jeremiah P. Singer](#) Westat, Inc., Rockville, Maryland

Abstract

This study, concerned with the development of driver interface criteria for a rear obstacle detection system, assessed the appropriateness of alternative warning timing algorithms and evaluated various interface approaches for presenting warning information to drivers. Interface testing used a minivan and a passenger sedan equipped with a prototype rear obstacle detection system. Two different warning timing algorithms and four different interface conditions were examined. The appropriateness of the warning timing algorithms was tested using an alerted backing procedure wherein drivers backed to known obstacles and braked in response to the warning. A surprise event scenario was also included in order to examine driver reaction to the warning under unexpected conditions. Alerted backing results suggest that although both timing algorithms led to few target strikes, one algorithm led to more acceptable ratings, fewer target strikes and close calls, and less urgent braking. None of the interface warning conditions reliably induced avoidance braking under the surprise event condition. Actual or potential applications of this work include the appropriate design of effective backing warning systems.

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