

November 2019

RESEARCH PROJECT TITLE

Speed Management: Noteworthy Practice and Guidance

SPONSORS

Iowa Department of Transportation
(InTrans Project 19-685)

PRINCIPAL INVESTIGATOR

Shauna Hallmark, Director
Institute for Transportation
Iowa State University
515-294-5249 / shallmar@iastate.edu
(orcid.org/0000-0001-5187-8022)

CO-PRINCIPAL INVESTIGATOR

Neal Hawkins, Associate Director
Institute for Transportation
Iowa State University
515-294-7733/ hawkins@iastate.edu
(orcid.org/0000-0003-0618-6275)

MORE INFORMATION

intrans.iastate.edu

CTRE

Iowa State University
2711 S. Loop Drive, Suite 4700
Ames, IA 50010-8664
515-294-8103

The mission of the Center for Transportation Research and Education (CTRE) at Iowa State University is to conduct basic and applied transportation research to help our partners improve safety, facilitate traffic operations, and enhance the management of infrastructure assets.

The sponsors of this research are not responsible for the accuracy of the information presented herein. The conclusions expressed in this publication are not necessarily those of the sponsors.

This project developed guidelines summarizing the state of the practice and best practices for two speed reduction strategies: setting proper speed limits and using dynamic speed feedback signs.

Project Objectives

- Assess the current state of the practice and best practices for setting speed limits
- Summarize the best practices for using dynamic speed feedback sign (DSFS) systems and provide recommendations on their use

Problem Statement

Guidance on strategies to reduce speeding—particularly setting proper speed limits and using DSFS systems—varies from state to state, so a comprehensive overview of the state of the practice and up-to-date recommendations are needed.

Background

Speeding, defined as exceeding the posted speed limit or driving too fast for conditions, contributes to approximately one-third of all traffic fatalities and costs society about \$40.4 billion each year.

The primary purpose of a speed limit is to set the maximum reasonable and safe speed at which a normal driver can react to driving situations under favorable weather and visibility conditions. Appropriately set speed limits can result in a more uniform traffic flow, appropriately balance safety and mobility, and serve as the basis for speed enforcement.

DSFS systems are traffic control devices that consist of a speed measuring device, which may use either loop detectors or radar, and a message sign that displays feedback to drivers who exceed a predetermined speed threshold. The feedback may be the driver's speed, a message, or activation of a warning device.



Hallmark et al./CTRE

Dynamic speed feedback signs displaying an approaching driver's speed (left) and a warning message (right)

Development of the Guidelines

Setting Speed Limits

The authors researched the general purposes of and approaches to setting speed limits and reviewed recent surveys and proposed standards related to speed limits. The authors then researched and summarized various state practices for four key topics: setting speed limits, establishing speed zone lengths, using transition zones, and setting school zone speed limits.

Using DSFS Systems

The authors researched general information about the configurations and uses of DSFS systems, the effectiveness of DSFS in various situations, driver attitudes toward DSFS, and guidelines on using DSFS. With this information, the authors drafted recommendations for using DSFS.

Key Content of the Guidelines

The guidelines provide extensive information about setting speed limits and using DSFS systems.

Setting Speed Limits

- Five approaches to setting speed limits are described: statutory, engineering, expert system, safe systems, and optimization.
- The results of two recent surveys on practices for setting speed limits involving hundreds of transportation professionals are presented. Both surveys indicate that 85th percentile speeds are featured prominently in these practices and that use of the Federal Highway Administration's expert systems, USLIMITS and USLIMITS2, is limited.
- Recommendations and a proposed revision to the *Manual on Uniform Traffic Control Devices* resulting from a January 2018 task force created by the National Committee on Uniform Traffic Control Devices are summarized.
- An extensive summary of various state practices for setting speed limits is provided. Practices can vary by state and, within each state, practices can vary by agency. The summary focuses on four key areas: setting speed limits, establishing speed zone lengths, using transition zones, and setting school zone speed limits.

Using DSFS Systems

- Numerous studies are summarized on the effectiveness of different types of DSFS systems in various locations, including arterials, collectors, school zones, and transition zones. The studies indicate that DSFS systems are effective at reducing speeds.
- The results of two surveys on driver attitudes toward DSFS are presented. Both surveys indicate that most drivers reduce their speeds in the presence of a DSFS and believe DSFS to be effective.
- An extensive summary on guidance developed by various agencies and organizations for using DSFS systems is provided. Most guidance recommends that DSFS systems be limited to locations where a speeding issue is evident. Some guidance suggests that DSFS systems are most effective on lower speed roadways, while other guidance recommends the opposite.
- Recommendations for using DSFS systems are provided based on other agencies' practices and the authors' expertise in both speed management and DSFS systems. The recommendations include considerations related to demonstrating a speeding problem, traffic volume thresholds, roadway type, other traffic control, school zones, roadway context, and other factors.

Implementation Readiness and Benefits

Transportation professionals can use these guidelines to make sense of the often overwhelming and sometimes contradictory information available on the two speed reduction strategies discussed: setting proper speed limits and effectively using DSFS systems.

For both strategies, the guidelines compile a valuable and comprehensive summary of the state of the practice and best practices based on extensive research. The guidelines also provide helpful recommendations for using DSFS, based on existing guidance and expertise, that address critical and frequently encountered considerations.