Speed Warning Systems

CC 11

Photo: Courtesy of Neil Hetherington, WTI

Description: Speed warning systems inform motorists that based on their vehicle speed, road geometry, weather conditions, or other factors, they are driving too fast. Some speed warning systems include:

- Variable speed limit (see #TM2),
- Dynamic speed feedback signs,
- Speed detection and enforcement,
- Vehicle-based monitoring and feedback systems,
- Dynamic curve warning systems (see #CC9),
- Downhill speed warning systems (see #CC9),
- Commercial vehicle operations speed warning systems (see #CC9), and
- Road geometry speed warning systems (see #CC9).

Rural Transportation Critical Needs

- ☑ Crash Countermeasures
- ☐ Emergency Services
- ☑ Operations & Maintenance
- ☐ Rural Transit & Mobility
- ☐ Surface Transportation & Weather
- ☐ Tourism & Travel Information
- ☐ Traffic Management

Issues Addressed

- ☑ Road Geometry Warning
- ☐ Highway-Rail Crossing Warning
- ☐ Intersection Collision Warning
- ☐ Pedestrian Safety
- ☐ Bicycle Warning
- ☐ Animal Warning
- ☐ Collision Avoidance
- ☐ Collision Notification
- ☐ Weather Warning

Strategies Achieved

- ☑ Road User
- ☐ Road
- ☐ Vehicle
- ☑ Safety Culture
- ☑ Engineering
- ☐ Emergency Response
- ☐ Enforcement
- ☑ Education

Applicability

- Dynamic speed feedback signs can be installed in a rural context, for example, in a school zone in a rural area to remind drivers of the speed. They can also inform drivers of the transition from a higher speed rural environment to the lower speed of the main street in a rural community. These tools help to remind drivers to travel at speeds appropriate for the context, thereby enhancing safety, as speed is often found to correlate with collisions. Considering the developments of technology in recent years, for example using solar power sources, the ability to implement such systems in a rural context can be relatively cost effective.

Partnerships

- Applications benefit from collaboration among numerous agencies, which may include:
  - Departments of transportation (local, state, federal)
  - Schools
  - Law enforcement
  - Local community

Key Components

- Speed feedback sign
- Power source (e.g. solar)
- Speed radar
- Ability to send speeding violations to offenders

Examples of Implementation

- **Speed Warning System to Assist Buses in Rural School Zones**

The Iowa Department of Transportation (DOT) installed a 55 mph reduced speed limit sign in a school zone to assist buses in turning into and out of the school. While average speeds were only reduced by approximately 2 mph, the Iowa DOT was encouraged by the reduction in motorists traveling at excessive speeds as a result of the speed warning system.

- **Holliston, Massachusetts**

Highway 126 is a major commuter route that runs through Holliston, Massachusetts. A dynamic speed feedback sign, pedestrian crossing signs, and a raised crosswalk were all installed where Highway 126 becomes the main street of Holliston, Massachusetts for traffic calming.

- **Sequential Dynamic Curve Warning System**

Iowa, Missouri, Texas, Washington, and Wisconsin participated in an evaluation project with Iowa State University on a Sequential Dynamic Curve Warning System (SDCWS). This system consists of solar-powered, LED enhanced signs that light up sequentially as a vehicle traverses the curve. This study evaluated their effectiveness at reducing speeds.

- **Oregon's Dynamic Advanced Curve Warning System**

This Dynamic Advanced Curve Warning System was installed on I-5 in Oregon in a section known as the Myrtle Creek Curves. This is a system custom designed by the Orgon Department of Transportation using radar to measure speeds and warning messages based on the measured speed.

Implementation Considerations (General)	Implementation Considerations (Pro)	Implementation Considerations (Con)
•See the Manual on Uniform Traffic Control Devices (MUTCD) for more information on light-emitting diodes (LEDs). •LEDs should flash at a rate of more than 50 but less than 60 times per minute.	•Systems reduce crashes. •They are effective for reducing average, 85th percentile, and "high-end" speeds.	•Trial installations have had signs stolen. •Motorists may choose to drive faster to "test" to see how high they can get the speed display to read. •There are concerns that such signs or enforcement programs may be overly invasive.

Opportunities for Future Expansion

- At present speed warning systems are visible systems installed on the transportation infrastructure that require the users to respond to queues. In the future, with the development of connected vehicles, speed feedback information can be provided to motorists to remind them to obey the speed limits, as discussed in a study found in the U.S. Department of Transportation (USDOT), National Highway Traffic Safety Administration's (NHTSA) Traffic Tech Technology Transfer Series', *Investigation of the Use of and Feasibility of Speed Warning Systems*, and the USDOT's NHTSA's, *Investigation of the Use and Feasibility of Speed Warning Systems*.

Additional Resources

- Federal Highway Administration, Public Roads, *Spotlight Speed Feedback Signs*, found here: http://www.fhwa.dot.gov/publications/publicroads/16marapr/04.cfm
- *National Center for Safe Routes to School*, found here: http://www.saferoutesinfo.org/
- *Evaluation of Dynamic Speed Feedback Signs on Curves: A National Demonstration Project*, found here: https://www.fhwa.dot.gov/publications/research/safety/14020/14020.pdf

Useful Tip

Dynamic Curve Warning Systems can also be used to measure weight and height, as well as, speed and provide warnings to motorists.

Cost Range

(Cost/financial information, where noted, is based on 2016 dollars (unless otherwise specified). Cost/financial information is estimated, and will vary based on size and scope of project, number of units, etc. In general, capital costs include initial purchase costs of hardware, software, and other required equipment. Maintenance and operations costs include staff time to operate, monitor and maintain systems; data collection; system upgrades; evaluation; etc.)

Capital Costs: The total capital cost for this tool is low (Less than $50,000). For example, installation, support and maintenance of dynamic speed warning feedback signs installed in Arizona, Florida, Iowa, Ohio, Oregon, Texas and Washington cost less than $10,000 per sign[1]. Installing LEDs on a sign can cost $2090, $1850, or $1800 for a 48 inch, 38 inch, and 30 inch sign, respectively[2]. This does not include the cost for a post and anchor, which is estimated to be $197 more.

Operations Costs: The operations and maintenance costs for this tool are anticipated to be low (Less than $50,000). The likely costs include replacements of lights, sign replacements, and power.

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