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Radar Speed Displays
How Effective Are They?

Radar Speed Display signs have been proven effective through many studies. The following is a small sampling of research performed by various agencies.

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Effectiveness Quotes – (Multiple Sources)

Police and Security News: May-June 2003 issue

"77% exceeded the 20mph speed before placement of the [speed trailer]; afterwards only 20% exceeded the speed limit" San Diego Sheriffs Department, Police & Security News, September/October 2002

LED radar speed displays "[produce] sustained, long-term speed reductions and improved speed limit compliance". Studies done in El Paso and Del Rio, TX, studies showed 81% of vehicles exceeded the speed limit, and the unit was placed in service, only 18% of vehicles exceeded the posted limit.

Phoenix, Arizona

The 85th percentile vehicle speed was reduced from 47-48 mph to 14-16 mph, in a 15 mph zone in the City of Phoenix, AZ.

Marshall, TX Messenger, November 29, 2000

Long-term display effectiveness is also demonstrated. On the day after installation of a display in Marshall, TX, compliance rate was 69%-72%. One month later, 73% compliance rate was measured.

"Study Reports on the Effectiveness of Photo-Radar and Speed Display Boards"

Paper presented at the Annual Meeting of the Transportation Research Board, Washington, D.C., and January 1998. . Anderson, Roy W., P.E

..... This study also revealed that all speed control devices produced more significant results on speeds of 10 mph or more over the 25-mph speed limit. Photo-radar reduced these excessive speeds by 30.2 percent, and the speed display board reduced them by 34.9 percent. The study concluded that radar speed feedback signs are more cost-effective.



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School Zones (Campus Safety)



Sep/Oct 2006

<http://www.campussafetymagazine.com/Articles/?ArticleID=57>

Slowing Traffic: A Fresh Look at an Old Problem- by John Dixon

With their potentially fatal mix of pedestrian and automobile traffic, campuses must deal with the persistent problem of speeding. Knowing the truths and myths about this issue can help university, hospital and school parking professionals put the brakes on accidents, injuries and deaths.

Summary:

In a recent national survey, traffic engineers and other safety professionals ranked driver feedback signs as the most effective traffic-calming method for neighborhoods and school zones. Researchers suggest that the sign's effectiveness is due to the fact that, unlike static speed signs that are often ignored, feedback signs refocus driver attention on his/her own speed rather than on their personal evaluation of driving conditions.

Interestingly, research also indicates these calming devices continue to slow traffic even after they become long-standing fixtures at a location.

A study published by the Transportation Research Board in Washington, called the Comparative Study of Speed Reduction Effects of Photo-Radar and Speed Display Boards, showed that almost the same speed reduction was being achieved four months after installation.



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School Zones (TRB)



[Volume 1973 / 2006;](#)

<http://trb.metapress.com/content/v5923pr9n156m442/>

Effectiveness of Speed-Monitoring Displays in Speed Reduction in School Zones

Author(s):

Choulki Lee (Graduate School of ITS, Ajou University, San 5, Wonchon-Dong, Youngtong-Gu, Suwon 442-749, South Korea), Sangsoo Lee and Youngtae Oh (School of Environmental Civil and Transportation Engineering, Ajou University, San 5, Wonchon-Dong, Youngtong-Gu, Suwon 442-749, South Korea), Bongsoo Choi, (Division of Traffic Operation and Safety, City of Gwacheon, 72 Gwanmun-Ro, Gwacheon City, Gyeonggi-Province, South Korea)

Summary:

Speeding is one of the major causes of the frequent and severe traffic accidents that occur in school zones. Two field studies were conducted to assess the short-term and long-term effectiveness of speed-monitoring displays (SMDs) for speed reduction in school zones. The performance difference is discussed according to several dependent variables, including the average speed, the 85th percentile speed, and the distribution of speeds.

The short-term study results showed that the speed of vehicles began to be reduced when the driver recognized the presence of an SMD, and the average speed was reduced by about 17.5% (8.2 km/h) at the SMD location.

This speed reduction was observed throughout the day, regardless of the time of day. A similar performance trend was identified from the long-term study results, but the average speed reduction was slightly reduced to 12.4% (5.8 km/h) at the SMD location. However, statistical analyses showed that the speed differences were statistically significant. In addition, analysis of the results of the speed distribution showed that the number of speeding vehicles was greatly reduced after the SMD was installed, and the 85th percentile speed also decreased from 54.3 to 46.3 and 45.0 km/h in the short-term and the long-term studies, respectively.

Therefore, it was concluded that the application of SMDs in school zones produced a positive impact on the drivers' behaviors for a long period of time.



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School Zones (USDOT)



Studies from Utah Department of Transportation
Research and Development Division

<http://www.udot.utah.gov/main/f?p=100:pg:1731151821951842794:::1:T,V:1293>

Speed Monitoring Displays

Brigham Young University, Department of Civil & Environmental Engineering

School Zones - Report UT- 05.13, 2005

[Increasing Speed Limit Compliance in Reduced Speed School Zones](#)

Author(s): Mitsuru Saito, Ph.D., P.E., Kelly G. Ash, EIT

Summary:

The field study found that the Speed Monitoring Displays (SMDs) analyzed proved to increase speed compliance in most cases. In some cases, the SMDs maintained their effectiveness at increasing speed compliance; on the other hand, some gradually lost some of their effectiveness.

The distribution of speeds at essentially every location demonstrated a reduction in excessive speeds. For the most part, these SMDs helped improve school zone safety by decreasing speeds and increasing speed compliance as manifested by the decrease in mean speed, standard deviation, 10 mph pace range and the percentage of vehicles exceeding the 20 mph school zone speed limit.



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Neighborhood & Pedestrian Zones (Bellevue, WA)



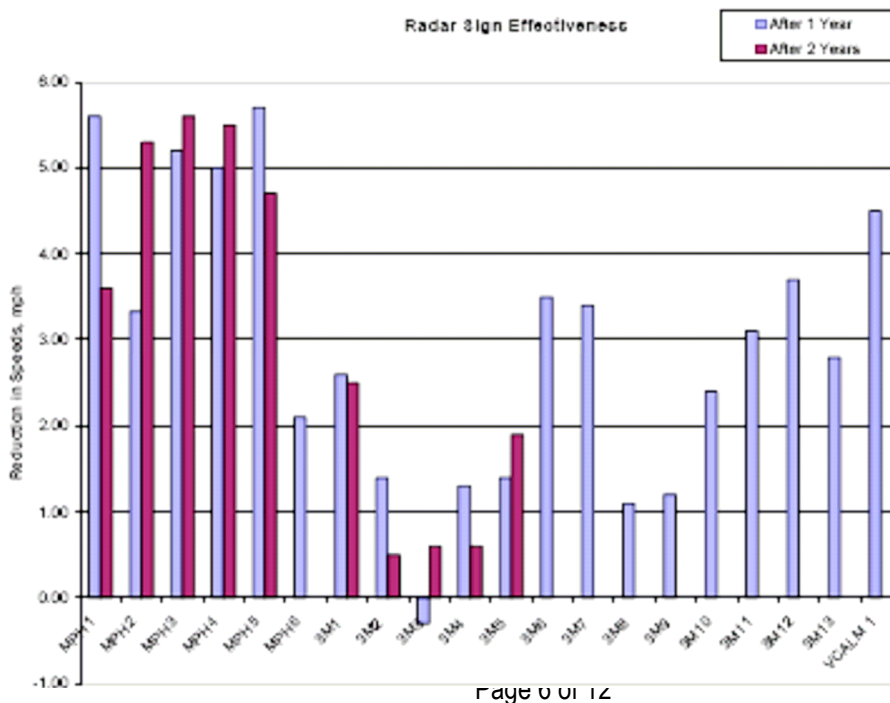
2005 REPORT - Effectiveness of Radar Signs

Prepared by Ray Godinez, Neighborhood Traffic Calming Program

Bellevue has experienced speed reductions between 1 and 5 mph at the majority of radar sign locations. In some cases, there have been higher speed reductions, upwards of 5.5 mph.

The limited effectiveness of some radar signs on speeds may be linked to several factors. The first factor is the location of the sign and the visibility for approaching motorists. At the location where speeds went unchanged, there is limited sight-distance of the radar sign. Another factor appears to be the speed of the roadway before the signs were installed. The location mentioned above had 85th percentile speeds that were already near the posted speed limit (see Appendix pages 12-31 for site specific data for each location). In order to determine how the radar signs performed several years after installation and if they lose their effectiveness over a period of time, speeds studies were done at all radar signs that had been in place for two years or more (see Appendix page 11).

Yet a few locations had limited or no speed reduction at all, as demonstrated in the following chart; As shown below, the majority of signs continue to experience speed reductions of significant value up to four years after installation.





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Rural Roadways - Highway Safety (CHP)



This CHP memorandum demonstrates that SpeedCheck radar speed displays were an effective solution in helping reduce collisions.

State of California

Business, Transportation and Housing Agency

Memorandum

Date: February 2, 2007

To: Humboldt Area

From: **DEPARTMENT OF CALIFORNIA HIGHWAY PATROL**
Humboldt Area

File No.: 125.11998

Subject: **REDUCTION OF COLLISIONS ASSOCIATED WITH ROADWAY CHANGES
IN THREE AREAS OF HUMBOLDT COUNTY**

In 2006, there was a significant reduction of collisions at three locations in the Humboldt Area. The reduction of collisions was associated with engineering changes made by the California Department of Transportation (Cal Trans). These changes include changing the roadway surface from conventional asphalt/concrete pavement to "open grade" asphalt/concrete pavement and posting additional signs, some of which are radar-activated signs that indicate the speed of approaching motorists. Two of these areas are located on US 101; the third area is located on SR-299.

The north most area is located on US 101, between mile post markers 101 HUM 124.71 and 125.98; a stretch of highway frequently referred to as 'the curves just south of the by-pass, north of the old fish hatchery.' In 2004, there were nine reported collisions in this area. In 2005, there were eight reported collisions in this area. Cal Trans completed a safety project, which included a change to "Open Grade" roadway surface, and the addition of radar activated signs in December of 2005. In 2006, there were five reported collisions in this area

The second area on US 101 is located between milepost markers 101 HUM 109.42 and 112.53; an area commonly called 'the Big Lagoon curves.' In 2004, there were 12 reported collisions in this area. In 2005, there were also 12 reported collisions in the area. Cal Trans completed a safety project in this area that included radar activated signs and a change to "open grade" roadway surface in December of 2005. In 2006, there were five reported collisions in this area.

The third area is located on SR-299 on the east slope of Lord Ellis Summit, between milepost markers 299 HUM 19.05 and 20.67. Though the curves are not as tight as those on US 101 are, the roadway grade is steep. Both in 2004 and in 2005 there were 12 reported collisions in this area. Though there was no comprehensive safety project conducted in this area, Cal Trans conducted a number of incidental improvements and repairs. This area does not have radar-activated signs. In 2006 there were three collisions reported in this area.



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Police & Targeted Enforcement (drivers.com)



Published 1995-10-09

<http://www.drivers.com/article/170/#effects>

What works in changing road user behavior?

Author(s): **Lawrence P. Lonero and Kathryn Clinton** (Northport Associates), **Gerald J.S. Wilde** (Queen's University), **Kent Roach and Heather MacLean** (University of Toronto), **A. James McKnight** (National Public Services Research Institute), **Steven J. Guastello** (Marquette University), **Robert W. Lamble** (Ministry of Transportation, Ontario)

A number of studies have looked at the effects of combining enforcement with feedback signs.

One study on two major commuter routes into Dartmouth, Nova Scotia, found that feedback signs (for example, percentage of drivers not speeding last week, or "Best Record" percentage) substantially decreased the number of drivers who drove at more than 10 km over the limit.

Studies found that the effect of feedback signs was further increased when police stopped speeders and gave them informational materials and warning tickets, and when police stopped drivers who were traveling close to the limit, thanked them, and gave them token rewards.

In the latter case, the number of drivers traveling more than 10 kph over the speed limit was reduced by 48% and those going more than 20 kph over the limit by 64%.

Studies of the effect of boosting enforcement -- for example, by doubling patrol density -- also showed significant effects.



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Work Zones (USDOT)



Studies from Utah Department of Transportation
Research and Development Division

Work Zones - Report UT- 03.12, 2003

[Efficacy of Speed Monitoring Displays in Increasing Speed Limit Compliance in Highway Work Zones](#)

Brigham Young University, Department of Civil & Environmental Engineering

Author(s): Mitsuru Saito, Ph.D., P.E. Jeanne Bowie, E.I.T

Summary:

Speed Monitor Displays (SMDs) convey single message, and are effective!

- When the SMD was present, average speeds decreased six percent.
- Mean speed reductions by four to five MPH
- SMDs also slow down vehicles with radar detectors
- Survey of 622 motorists had 79% responding that SMD conveys the message: "Check your speed and slow down". 87% believe a SMD encourages drivers to go the speed limit.



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Multiple Applications – Permanent-mounted (Researcher)



Texas Transportation Institute - The Texas A&M
University System - September 2003;

<http://tti.tamu.edu/documents/0-4475-1.pdf>

EVALUATION OF DYNAMIC SPEED DISPLAY SIGNS (DSDS)

Author(s): Elisabeth R. Rose and Gerald L. Ullman
College Station, Texas 77843-3135

Summary:

The perceived likelihood of an enforcement presence at a site appears to contribute to the speed reductions achieved by installing a DSDS. At the school speed zone (where enforcement activities tend to be higher) and at the approach to a signalized intersection on a high-speed roadway (where a significant enforcement presence was noted by researchers during all three field studies), average speeds decreased by 4 to 9 mph after the DSDS were installed. Furthermore, these reductions were maintained over the four-month period that the three studies (before, first after, and second after) were performed.

... the average speed at the DSDS dropped substantially from 44.5 mph in the before study to 35.3 mph shortly after the sign was installed, suggesting that the DSDS was responsible for an initial 9.2 mph decrease in average speed at the beginning of the school speed zone.

For the second after study conducted four months after DSDS installation, the average speed was 35.7 mph, still 8.8 mph below the average recorded at that location in the before study. At this site, it does appear that installing the DSDS resulted in a significant decrease in average speeds that was maintained over a 16week period.



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Multiple Applications – Permanent-mounted (TRB)



[Volume 1918 / 2005](#)

<http://trb.metapress.com/content/3028rr500u381630/>

EVALUATION OF DYNAMIC SPEED DISPLAY SIGNS (DSDS)

Summary:

This paper describes an Analysis of the effectiveness of dynamic speed display signs (DSDSs) installed in several permanent locations. Sites evaluated included a school speed zone, two transition speed zones in advance of a school speed zone, two sharp horizontal curves, and two approaches to signalized intersections on high-speed roadways. Data were collected before the DSDSs were installed, about one week after installation to determine initial effects of the signs upon vehicle speeds, and again about four months after installation to determine how well the initial speed reductions were maintained.

Researchers Analyzed average speeds, 85th percentile speeds, and the percentage of the sample exceeding the speed limit. In addition, least-squares regression Analyses between the speed of a vehicle upstream of the DSDS and that vehicle's speed measured again at the DSDS were performed to determine whether the sign affected higher-speed vehicles more substantially than lower-speed vehicles.

Overall, average speeds were reduced by 9 mph at the school speed zone. Elsewhere, the effect of the DSDS was less dramatic, with average speeds reduced by 5 mph or less depending on the location tested.

As expected, those motorists traveling faster than the posted speed limit did appear to reduce their speed more significantly in response to the DSDS than did motorists traveling at or below the posted speed limit.

The results of this project suggest that DSDSs can be effective at reducing speeds in permanent applications if appropriate site conditions apply.



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Comparison Types of Speed Control (US Roads)



Road Injury Prevention & Litigation Journal

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<http://www.usroads.com/journals/p/rij/9805/ri980504.htm>

Study Reports on the Effectiveness of Photo-Radar and Speed Display Boards

Summary:

Steven A. Bloch reported the study's results in "A Comparative Study of the Speed Reduction Effects of Photo-Radar and Speed Display Boards," a paper presented at the Transportation Research Board's 77th Annual Meeting (January 1998). The study's "primary conclusion" was:

"While both photo-radar and speed display boards can be effective in reducing vehicle speeds, display boards offer better overall results."

Cost-Effectiveness Measure	Type of Speed Control			
	Photo-radar (Police Costs Only)	Photo radar (Police and Equipment)	Unenforced Speed Display Board	Enforced Speed Display Board
Cost per deployment	\$155.00	\$220.36	\$10.29	\$91.79
Cost per mph of speed reduction				
Each hour of deployment	\$8.42	\$11.98	\$0.20	\$1.27
Full 12-hour day	\$119.23	\$169.51	\$2.39	\$16.39
Cost per driver exposed	\$0.39	\$0.55	\$0.01	\$0.08

TABLE 1- Cost-Effectiveness Estimates for Speed Display Boards, Photo-radar and Speed Display boards with Enforcement

Results of the study revealed "that both speed display boards and photo-radar effectively reduces vehicle speeds while deployed" and are "particularly effective in reducing the number of vehicles traveling ten or more miles over the speed limit." However, "only the display boards demonstrated carry-over effects," particularly in the long term. Already the most cost-effective of the speed control devices, the speed reduction capabilities of display boards can be greatly enhanced with "intermittent police enforcement."