# AGENDA

# TRANSPORTATION SAFETY AD-HOC COMMITTEE

**91136 N Willamette Street**

**541-682-7852 | coburgoregon.org**

**Thursday, February 22, 2024 at 4:00 PM**

**CALL MEETING TO ORDER**

**ROLL CALL**

**PUBLIC COMMENT**

**MINUTES FOR APPROVAL**

1. February 1, 2024 Transportation Safety Ad-Hoc Minutes

**COMMITTEE DISCUSSION**

2. Recap of Meeting #1
3. N. Willamette & Van Duyn Intersection

**FUTURE AGENDA ITEMS**

**FUTURE MEETINGS**

3/28/2024 Transportation Safety Ad-Hoc #3
4/25/2024 Transportation Safety Ad-Hoc #4
5/23/2024 Transportation Safety Ad-Hoc #5
6/20/2024 Transportation Safety Ad-Hoc #6 (Final Meeting)

**ADJOURNMENT**

*The City of Coburg will make reasonable accommodations for people with disabilities. Please notify City Recorder 72 hours in advance at 541-682-7852 or sammy.egbert@ci.coburg.or.us*

*All Council meetings are recorded and retained as required by ORS 166-200-0235.*

# MINUTES
## Transportation Safety Ad-Hoc Committee Meeting

February 1, 2024 at 4:00 P.M.
Coburg City Hall
91136 N Willamette Street

**MEMBERS PRESENT:** Mayor Bell; Chair, Brandon Rhodes, John Lehmann, Bryan Hamburger, McKenzie Bryant, John Marshall, Jean Schapper (via zoom),

**ALTERNATES PRESENT:** Vilma McDonald (citizen alternate), Michael McDonald (citizen alternate)

**MEMBERS ABSENT:** NONE

**GUESTS/STAFF PRESENT:** Adam Hanks, City Administrator; Brian Harmon, Public Works Director; Larry Larson, Chief of Police; Megan Winner, Planning Director

**TRANSCRIBED BY:** Madison Balcom, Administrative Assistant

**CALL TO ORDER**

Mayor Bell called the meeting of the Coburg Transportation Safety Ad-Hoc Committee to order at 4:04 pm.

**ROLL CALL**

Mayor Bell called roll.

**WELCOME**

1. **Introductions**

Everyone went around and introduced themselves.

2. **Committee Scope – Resolution 2023-15**

City Administrator, Adam Hanks went over the goal of the committee as tasked in Resolution 2023-15.

Ms. Bell mentioned that transportation in Coburg has always been a hot topic, and they really need input and recommendations from this committee and the citizens to help make changes.

Mayor Bell also noted that she and Council were very appreciative of the interest from the community in participating on this Ad-Hoc committee.

3. **Deliverable to Council**

Mr. Hanks said that staff would like to bring requests to Lane County more as a package rather than as individual requests, which may take some time to implement. Staff would also like to provide the committee with some education on the questions and concerns that come up throughout the process. The focus of this committee is the human scale elements regarding transportation safety within Coburg.

4. **Election of Chair and Vice Chair**

Ms. Bell volunteered as Chair, and Bryan Hamburger volunteered as Vice Chair.

**MOTION**

Ms. Bell moved, seconded by John Lehmann to assume Nancy Bell as the position of Chair, and Bryan Hamburger as the position of Vice Chair.

***Motion passed unanimously — 7:0.***

**PRESENTATION BY STAFF**

Mr. Hanks presented details on the different jurisdictional control and regulatory authority of the streets within the Coburg city limits, noting that it is ultimately an important component of the recommendations but that the committee doesn't need to focus on that in the initial discussions and formulation of recommendations. Staff will assist with the regulatory aspects of the potential projects being considered

1. **Safety Enhancements**

Mr. Hanks gave a presentation on pedestrian safety, including light beacons for crosswalks, additional marked crosswalks, and signage and lighting improvements.

2. **Speed Reduction and Control**

Mr. Hanks then gave a presentation on speed reduction, including speed limits and signage, traffic calming devices, crosswalks, and trees, landscaping, and design elements. He mentioned available tools and possible opportunities regarding certain areas and streets.

He then presented ideas for intersection improvements and also recommendation considerations, focusing on the N Willamette and Van Duyn intersection.

Michael McDonald asked who will decide on these decisions, like engineers, a committee, or outside sources.

Mr. Hanks said that they might engage their engineering consultant team in this process, but keep it at a minimum. The engineering team would definitely be involved in the implementation process.

Mr. Lehmann asked if the Ad-Hoc committee would make recommendations to council concerning funding or budgeting options.

Mr. Hanks said that wasn't initially part of the scope but it could when they get to the end of the recommendations, as funding is always an important consideration and street/transportation funds are always tight

Ms. Bell mentioned that Public Works and Administration could give them information on individual costs, and see if that changes the prioritization list.

Mr. Hanks said some recommendations could be a two part process; to first study a particular issue to fully understand the details/data, then move forward to implementation. The priority of recommendations might change based on what's most needed, wanted and viable.

John Marshall said there was a traffic impact study done on the new development by the N Willamette and Van Duyn intersection, and wasn't sure if that intersection was included in the study. He was concerned that because there weren't as many accidents as expected, improvements for it wasn't as high of a priority. Hanks noted that staff will provide the committee with the impact study associated with the new subdivision that Mr. Marshall mentioned.

Mr. Hanks and Ms. Bell said that there were not as many accidents as they expected there, but that will not hinder their efforts for improvement at that intersection.

Mr. Marshall asked if it was possible to have someone, like the Safe Routes to School program, to come in and help evaluate and develop improvements for that intersection.

Mr. Hanks said yes, and provided them with a handout about the standards and possibilities for improvements based on engineer and study recommendations.

3. **Project Ideas**

Mr. Hanks presented the projects and improvements. The first project was putting a crosswalk and flashing beacon on Coleman and Pearl, where there are no crosswalks and it frequently gets busy. He mentioned that they know the cost as staff has recently been through the permitting and installation process for the beacons and signage on N Willamette and McKenzie Streets.

Mr. Lehmann asked if the costs for the lighted crossings was done by the County. Mr. Hanks said no, but they contracted through them and shared some of the costs. It was around $20,000 to put those in. The next project was the N Willamette Street crosswalks. There are 4 different proposed spots for new crosswalks. He mentioned ranking them from most to least priority.

Mr. Hanks said that the one on Coburg Rd and Delaney St is the historic Hurley/Pollard house, which as a recent land use development approval that contains a condition of its approval to install the crosswalk as part of the project, which would be a cost and permit process responsibility of the developer rather than the City   For that reason, the committee may want to rank it as the lowest priority of the four proposed crossings.

Ms. Bell asked Chief Larson if they have had problems with people crossing Coburg Rd to get to Coburg Pizza. He said yes, and with the traffic on that road it would help to have a formal crosswalk marking.

Ms. Bell asked how much a permanent radar sign would cost and Mr. Harmon said they budgeted for 3 of those, and the funding for those was switched over to the beacon. For all 3, It was roughly $28,000.

The next project was the N Willamette and Van Duyn intersection. He mentioned the new subdivision and how the route and traffic will change with that in place.

Mr. Harmon mentioned that they did a water line replacement project last year on Harrison, Macy and N Willamette in preparation for what's to come this next spring. They reconstructed Harrison from Van Duyn N to Macy, Macy W to N Willamette, N Willamette back to the intersection of Van Duyn. N Willamette will be reconstructed, have added sidewalks, some storm water management and some added speed cushions. He mentioned that speed cushions can cause some noise from bouncing equipment, trailers, etc.

Mr. Lehmann asked about making some of the streets a one-way. Mr. Hanks said that could help slow traffic down, but could cause other problems, and would result in a lot of new signage and extra projects. Mr. Harmon mentioned some potential problems with that, both staff agreed that one way designations are definitely a tool available to research and propose.

They discussed some other sidewalks and streets in the area.

**COMMITTEE DISCUSSION**

Mr. Hanks asked if anyone had any other ideas in mind that they didn't touch on.

Mr. Hamburger asked about the street lighting. Mr. Harmon said that some are city owned and some are not. They are now requiring developers to install conduit, but it isn't in the code yet. Mr. Hanks touched on the lighting situation and the preference problems that come up from residents on the intensity of light, exposure of the light source and desire for night sky mitigation

Mr. Marshall mentioned that the intersection at Willamette and Pearl backs up a lot during rush hour. He said they could bring this up to the county.   Hanks noted that issue and will include it in future discussions and potentially within a committee recommendation.

**NEXT MEETING**

Mr. Hanks proposed the fourth Thursday of every month at 4:00 pm.

February 22, 2024

March 28, 2024

April 25, 2024

May 23, 2024

June 27, 2024

**ADJOURNMENT**

Ms. Bell adjourned the meeting at 5:35 pm.

**APPROVED** by the Transportation Safety Ad-Hoc Committee of the City of Coburg on this 22nd day of February, 2024.

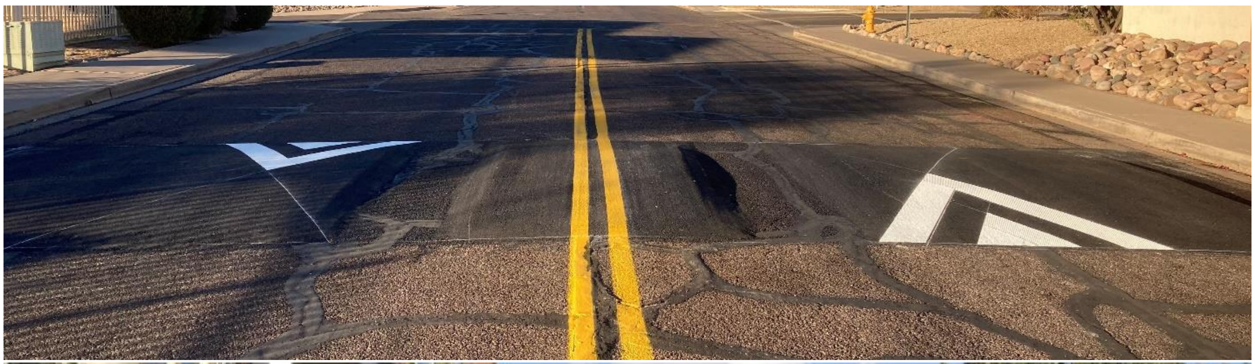


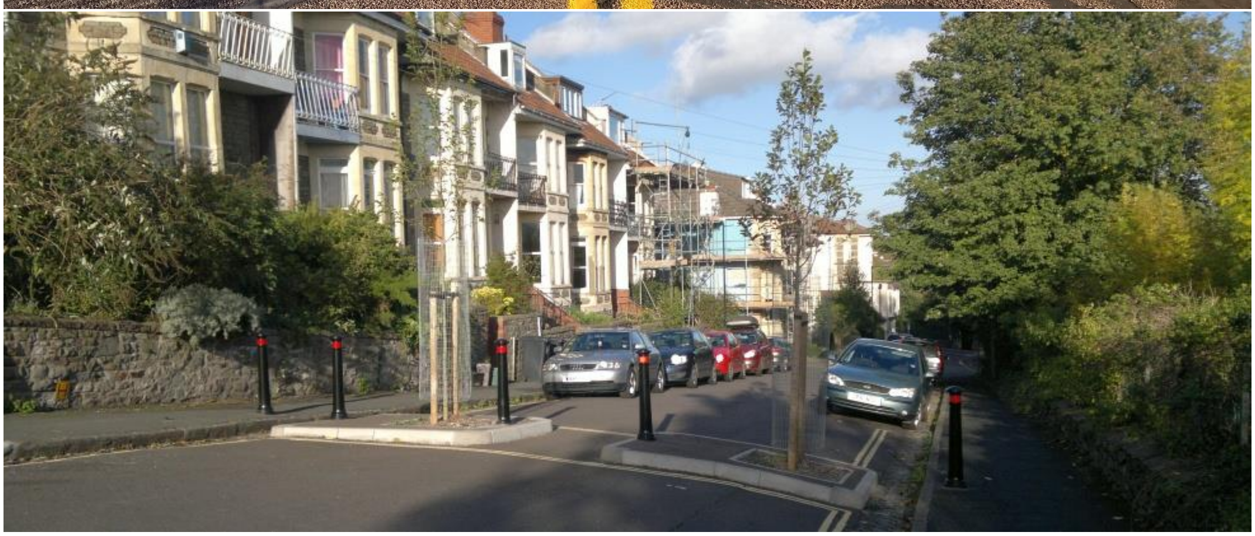
________________________________

Nancy Bell, Chair

**ATTEST:** ________________________________

Sammy L. Egbert, City Recorder





# Radar Speed Sign

Aug 6, 2023


The purpose of a radar speed sign, often referred to as a radar speed display or radar speed trailer, is to alert drivers to their current speed. These signs often have a digital display, a radar sensor, and occasionally extra capabilities.

A radar speed sign operates as follows:

1. Radar Sensor: A low-power radar beam is emitted by the sign's radar sensor and reflected off moving cars.

2. Speed detection: When a car passes in front of the radar sensor, the sensor calculates the car's speed using the Doppler effect, which results in a change in the frequency of the radar signal that is reflected.

3. Display: A sizable, clearly visible LED or LCD display is then used to show the speed that was measured. This monitor, which can display the vehicle's speed in digits, is often mounted above or below the radar sensor.

4. Driver Feedback: The main goal of radar speed signs is to give drivers immediate feedback about their current speed. The sign acts as a visual cue to slow down if a driver is going over the speed limit, encouraging them to travel at a more secure speed.

There may be additional characteristics on some radar speed signs, such as:

Data logging: Some radar speed signs include the ability to keep track of the passing cars' speeds over time. Traffic engineers can analyse speeding tendencies and assist with traffic management decisions by analyzing this data.

Reminder of Speed Limit: The sign may also show the stated speed limit, informing drivers of the permitted speed in that location.

When a driver significantly exceeds the posted speed limit, some radar speed signs may flash or display a warning like “SLOW DOWN”.

In residential areas, school zones, work zones, and other places where speeding is an issue, radar speed signs are frequently employed. They are a component of a broader set of traffic-calming measures designed to increase road safety and lower the likelihood of accidents brought on by driving too fast.

It’s crucial to remember that while radar speed signs can be useful in increasing awareness and promoting speed compliance, they often lack the ability to directly enforce speed restrictions through the issuance of penalties. They are mainly made to encourage better driving practices as a preventative measure.

For more Information visit our website https://www.photonplay.com/radar-speed-signs

## Innovative Operational Safety Improvements At Unsignalized Intersections

*Florida Department of Transportation*

2008

**Author(s)**

John R. Freeman, Jr., P.E. PTOE, Justin A. Bansen, P.E., Beth Wemple, P.E., Richard Spinks

**Summary**

The intent of this research is to identify innovative methods of improving safety at unsignalized intersection locations, particularly on high-speed, multi-lane roadways. The information contained in this Final Report is intended to serve as a guideline, synthesizing the broad range of potential treatments that were identified through this project. Some of the treatments are more experimental, with just a few prior implementations nationwide, while others are more recognizable (but may not be widely used currently within Florida). Methods reviewed in this study include among others: various meridian markings, LED raised pavement markers, LED stop signs, flashing beacons and radar speed signs (dynamic speed signs).

The study finds that radar speed signs have been shown to significantly impact speeds on horizontal curves and in work zones; however the placement of the device can impact its effectiveness. When coupled with a warning sign, the dynamic speed/warning combination is expected to raise awareness of the approaching intersection and provide active notification to drivers to slow down. The study suggests that, through the use of radar speed signs, speed reductions within the intersection area may have a direct impact on intersection safety. Reduced speeds allow for an increased time for perception and reaction to conflicting vehicles. Additionally, slower travel speeds may result in fewer severe collisions.

## Effectiveness of Photo-Radar and Speed Display Boards

*Road Injury Prevention & Litigation, Journal Volume 1973*

2006

**Author(s)**

(various)

**Summary**

This study examined three approaches to speed control: "photo-radar, (unenforced) speed display board, and a speed display board with intermittent enforcement."

Results of the study revealed "that both speed display boards and photo-radar effectively reduce 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."

The un-enforced speed display board was the most cost-effective device on both an hourly and daily basis, and photo-radar was the least cost-effective of the three speed control devices.

## Comparative Study of Speed Reduction Effects of Photo-Radar and Speed Display Boards

*Journal of the Transportation Research Board, Transportation Research Board of the National Academies, Volume 1640 / 1998*

2007

**Author(s)**

Steven A. Bloch
Automobile Club of Southern California

**Summary**

Two forms of automated motor-vehicle speed control, speed display boards and photo-radar, are compared. The study was conducted on three comparable streets in Riverside, California, over a 4-week period.

Although both devices produced substantial speed reductions while in operation, only display boards demonstrated carryover effects. The enforced display board produced a substantial short-term (but not longer-term) carryover effect; the unenforced display board demonstrated a longer-term (but not short-term) carryover effect, but only at the alongside location, 1 week after its removal. The three cost-effectiveness estimates generated showed that the unenforced speed display board was the most cost-effective; the enforced display board came in second; and the photo-radar placed third.

## Survey of Safety Professionals Regarding Traffic Calming Options

*Survey sponsored by Information Display Company*

2007

**Author(s)**

Information Display Company

**Summary**

- More than 96.5 percent (of those surveyed) said they strongly agree (66.7%) or agree (30%) that driver feedback signs are effective in reducing traffic speeds on residential streets. This is compared to only 3.3 percent that strongly agree (and 33.3% that agree) that speed bumps are effective. Rumble strips were ranked as being least effective.
- Respondents perceived "Police with radar guns" as being the most expensive traffic-calming option. "Speed bumps" were perceived as being the least expensive.
- Driver feedback signs were ranked as having the most immediate and long-lasting effect on calming traffic. This was followed in order by "Police with radar guns," "speed bumps," "static speed limit signs," and "rumble strips."

## Evaluation of Dynamic Speed Display Signs

*Journal of the Transportation Research Board, Transportation Research Board of the National Academies, Volume 1918 / 2005*

2006

**Author(s)**

Gerald L. Ullman, Elisabeth R. Rose

**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.

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.

## Effectiveness of Dynamic Speed Display Signs (DSDS) in Permanent Applications

*Texas Transportation Institute, Texas A&M University System, Project Summary Report 0-4475-S*

2004

**Author(s)**

Gerald L. Ullman, Elisabeth R. Rose

**Summary**

Texas Department of Transportation personnel identified several test sites to try out permanently installed DSDSs. TTI researchers conducted field studies to determine whether the signs reduced speeds at each site. Researchers also examined whether the signs increased vehicle conflicts or other types of erratic maneuvers.

DSDSs were installed at four common types of roadway situations where excessive speeds can be a significant safety or operational problem:

- at the beginning of regulatory school speed limit zones that are active only during the times when students are arriving or leaving school,
- at speed zones installed upstream of a school speed zone (to transition motorists down to the school zone speed limit),
- upstream of high-speed signalized intersections, and
- upstream of sharp horizontal curves.

Researchers found that a DSDS significantly reduced vehicle speeds at a school speed zone. Prior to the installation of the sign, the average speed entering one speed zone was nearly 10 miles per hour (mph) higher than the posted speed limit through that zone. After the DSDS was installed, the average speed decreased more than 9 mph. Furthermore, average speeds were still 9 mph lower when researchers returned to that site and measured speeds four months after DSDS installation.

## Stationary Radar Sign Program Report

*City of Bellevue, WA transportation Department Stationary Radar Sign, Program Report*

2005

**Author(s)**

Prepared by Ray Godinez

**Summary**

This report shares Bellevue's experience with (20 radar speed signs previously installed by the city over a five year period) from installation techniques to effectiveness levels and considerations for future placement.

(2004-2005) Studies show that the majority of the stationary radar signs continue to reduce 85th percentile speeds even though some have been installed for more than four years.

With the success to date of the stationary radar signs, it is recommended that the city continue to install the signs at appropriate locations. These signs provide a tool for those streets that cannot receive traditional traffic calming measures. However, as this report confirms, speed reductions are limited when 85th percentile speeds are below 10 mph over the posted speed limit. Therefore, the City's guidelines on radar sign placement has been updated to reflect the following:

- two-lane roadway
- does not qualify for typical physical traffic calming measures due to high traffic volumes and/or roadway characteristics, such as curves, or steep grades
- 85th percentile speeds 10 mph or higher than the posted speed limit
- As additional uses for these signs are explored, the City's guidelines may be revisited.

## Guidelines for Selection of Speed Reduction Treatments At High-Speed Intersections

*NCHRP Research, Report 613*

2008

**Author(s)**

Various

**Summary**

This study evaluated the effectiveness of treatments to reduce vehicle speeds at high-speed intersections. The treatments included geometric design features as well as signage and pavement markings. Radar speedcheck signs (dynamic displays) proved effective at slowing cars months after first being installed. In one study cited in this report, the speedcheck signs were installed at curved roadways where 10 truck rollover crashes were previously reported. Three years after the signs were in operation, no rollover crashes had been reported.

# School Zones

## Distracted Drivers In School Zones: A National Report

*Safe Kids USA, Department of Evaluation And Research*

2004

**Author(s)**

Jurek G. Grabowski, PhD, MPH, Stephanie Goodman, MPH

**Summary**

This study begins with a review of previous research that highlights the increased use by drivers of cell phones, GPS and other potentially distracting devices. It also provides data on how driver distraction can have a significant impact on response time, stopping distance and severity of accidents.

This information is followed by a review of an original study conducted by Safe Kids USA that looks at the prevalence and characteristics of driver distraction in school zones. To gather this data, trained observers were posted at 20 middle schools located in 15 states across the U.S. These observers collected data regarding the number of distracted drivers, the nature of their distraction and various other observational facts.

Findings of the study show that one in six drivers were distracted. Both male and female drivers had a high rate of distraction. Leading distracters included cell phones and other electronics followed by eating/drinking/smoking.

Given that radar speed signs are designed to grab the attention of distracted drivers and refocus their attention on to their own driving speed, this study offers a strong case for the high effectiveness of radar speed signs in slowing traffic in school zones.

## Effectiveness of Speed-Monitoring Displays in Speed Reduction in School Zone

*Transportation Research Board of The National Academies, Volume 1973*

2006

**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.

## Speed Monitoring Displays: Increasing Speed Limit Compliance in Reduced Speed School Zones

*Utah Department of Transportation, Research and Development Division*

2005

**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.

## Work Zones

### Innovative Traffic Control Devices for Improving Safety at Rural Short-Term Maintenance Work Zones

*Texas Transportation Institute, Texas A&M University System 3135 TAMU*

2008

**Author(s)**

Michael D. Fontaine

**Summary**

Five different traffic control devices were selected for further evaluation:

1. Speed display trailers
2. Radar drones
3. Portable rumble strips
4. Alternative worker vests, and
5. Fluorescent orange roll-up signs

This paper describes the results of the evaluation of these devices.

- The speed display trailer produced the largest speed reductions of all the devices tested. Average speed reductions of approximately 5 mph were achieved.
- (Workers) felt that the trailer produced significant speed reductions and the installation and removal of the trailer was reasonable for a short-term work zone.
- The radar drone produced smaller speed reductions than the speed display trailer, averaging less than 1 mph. Workers felt that the drone was very easy to set up and remove, but questioned its effectiveness when applied for long periods.
- Speed reductions for the rumble strips were between 1.5 and 4 mph.
- Maintenance crews were concerned that the amount of time required to install the portable rumble strips would be excessive for many short-term work zones.
- The fluorescent orange signs did not have any measurable impact on the speed of traffic in the work zone.

## Efficacy of Speed Monitoring Displays in Increasing Speed Limit Compliance in Highway Work Zones

*Brigham Young University, Department of Civil & Environmental Engineering, Report UT- 03.12*

2003

**Author(s)**

Bowie, Jeanne Marie

**Summary**

This study focuses on the goal of reducing speed in work zones. First, methods of speed reduction used by state DOTs throughout the country are identified, and the research surrounding them is summarized. Next, the methodology and results of a field study that tests the efficacy of the Speed Monitoring Display (SMD) are presented. For the field study, three main conditions were analyzed: a no-treatment case, with the MUTCD signs and barriers; a treatment case using the SMD; and a treatment case using a police vehicle. In the no-treatment case, average vehicle speed was reduced about 3 mph as vehicles entered the work area of the work zone. With the SMD, average vehicle speed was reduced an additional 4 mph. With the police vehicle, average vehicle speed was reduced about 6 mph more than in the no-treatment case.

Thus, average vehicle speed was reduced in all treatment cases; however, the police vehicle was slightly more effective than the SMD at reducing average speeds. (These conclusions are valid at a 95 percent confidence level.) The results of the survey also suggest that the SMD is a promising option for state DOTs. According to drivers' self-reports, those who normally drive a little faster than the speed limit are likely to slow down in reaction to an SMD, but drivers who normally ignore the speed limit are likely to ignore an SMD. The majority of drivers surveyed had positive reactions to SMDs, reporting that they feel SMDs are accurate, not distracting, and not difficult to read.

## Use of Speed Display Trailers in Work Zones

*Maryland State Highway Administration, Office Of Traffic & Safety*

2005

**Author(s)**

Various – see report's bibliography

**Summary**

**ADVANTAGES**

- Speed limit compliance is increased by 10 to 40 percentage points.
- The speed display trailer is an effective speed reduction measure in work zones. Mean speeds are reduced by 2 to 7 mph.
- Drivers have shown positive attitudes toward the speed monitoring display.
- Set-up and removal of the speed display trailer is easily accomplished.
- The speed display trailer is a cost-effective speed control measure.

**DISADVANTAGES**

- The effectiveness of the speed monitor display (may) decrease over time. Some factors affecting the effectiveness of the speed monitoring display include its size, placement and design of the trailer. (also) Larger speed displays are easier to read and attract more attention.
- Although an effective speed control countermeasure, speed reductions attained with the SDT are usually less than what is desired.

## Evaluation of speed displays and rumble strips at rural-maintenance work zones

*Texas Transportation Institute, Texas A&M University System, Transportation research record ISSN 0361-1981*

2001

**Author(s)**

Fontaine Michael D. ; Carlson Paul J.

**Summary**

An evaluation of the effectiveness of speed displays and portable rumble strips at reducing speeds in rural-maintenance work zones is described.

The results for the portable rumble strips were mixed, with passenger cars experiencing less than a 3.2-km/h (2-mph) reduction in mean speed approaching the temporary traffic-control zone. The impact of the rumble strips on trucks was more pronounced, with mean speed reductions approaching the temporary traffic-control zone of up to 11.6 km/h (7.2 mph) lower than normal traffic control. The percent of vehicles exceeding the speed limit in the advance warning area was also reduced when the rumble strips were used.

The speed display was generally more effective than the rumble strips at reducing speeds in the advance warning area. Mean speeds were often reduced approaching the activity area, with speed reductions of up to 16.1 km/h (10 mph) being achieved. The percentage of vehicles exceeding the speed limit was also reduced in the advance warning area.

### Intersections

## Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections

*National Cooperative Highway Research Program, Transportation Research Board of the National Academies, Final Report for NCHRP Project 3-74*

2007

**Author(s)**

Kittelson & Associates Inc.
Midway Research Institute
Synectics Inc.
Transportation Research Corp.

**Summary**

This project identified and evaluated treatments and developed guidelines for reducing vehicle speeds on approaches to high-speed intersections (approach speeds of 45 mph or greater).

The treatments investigated were: reduced lane width, visible shoulder treatments, speed tables, rumble strips, roadway environment, approach reverse curvature, roundabouts, splitter islands, wider longitudinal pavement markings, transverse pavement markings, and dynamic warning signs.

1. All three treatment types may reduce speeds on high-speed intersection approaches; however, speed reduction is likely to be minimal (i.e., less than 3 mph).
2. Of the three treatment types tested, dynamic warning signs activated by speed may be the most effective at reducing speeds. However, this conclusion is based on only three intersection approaches.
3. Peripheral transverse pavement marking also appear potentially effective at reducing speeds.
4. Based on a limited number of sites, rumble strips do not appear to be as effective at reducing speeds as dynamic warning signs or transverse pavement markings

## Transition Zones

### Evaluating Effectiveness of Dynamic Speed Display Signs in Transition Zones of Two-Lane Rural Highways in Pennsylvania

*Transportation Research Board, Annual Meeting – Paper #09-0171*

2009

**Author(s)**

Transportation Research Board

**Summary**

The Pennsylvania Department of Transportation has invested in several portable dynamic speed display signs and selected several locations to implement them along two-lane rural highway transition zones. Transition zones are longitudinal roadway sections that contain a high-speed segment followed by a low-speed segment and are commonly encountered in Pennsylvania along two-lane rural highways that pass through rural communities. A before-during-after observational study of free-flow passenger car operating speeds was undertaken at 12 transition zones to determine the effectiveness of the dynamic speed display signs.

The results of the analyses indicate that the dynamic speed display signs are effective in reducing free-flow speeds by an average of 6.4 mph (10.3 km/hr) while in place and activated. However, observed operating speeds increased by an average of 6.6 mph (10.6 km/hr) after the devices were removed from the study sites.

# Long-Term Effectiveness of Dynamic Speed Monitoring Displays (DSMD) for Speed Management at Speed Limit Transitions

Wayne Sandberg, Ted Schoenecker, Kristi Sebastian, and Dan Soler

**Abstract**. Speeding continues to be a significant safety issue on today's roadways. Studies have demonstrated that increased compliance with properly established speed limits reduces crash incidence and severity. One of the outcomes of Intelligent Transportation System (ITS) technology is the development of practical tools to enable the traffic engineer to more effectively manage speed on their roadway system. The Dynamic Speed Monitoring Display (DSMD) sign is one such tool. These signs measure the speed of the approaching vehicles and then feed this information back to the driver in real time via a dynamic message display. Portable DSMD signs (a.k.a. speed trailers) have been shown to be an effective engineering countermeasure for short-term speed control. However, experience has shown that as soon as the device is removed, speeds soon return to their previous levels.

This paper reports the results of a long-term evaluation of DSMD signs at speed reduction transition zones, which are those locations where the speed limit changes from a higher speed to a lower speed. The study was specifically targeted at locations were a rural highway transitions into an urbanized area. The study found a statistically significant decrease in overall vehicle speed immediately after the installation of the DSMD signs. The average speed reduction across all of the study sites was seven mph and it was found that these speed reductions were maintained over the course of the one year duration of the study. DSMD signs were shown to be effective long-term for speed management at speed transitions zones.

## INTRODUCTION

Drivers who exceed the posted speed limits have become a major concern for transportation agencies, cities and communities. These drivers, whether intentionally or not, place themselves and others in danger as well as reduce the overall quality of life for nearby residents and neighbors. Recent research suggests that safety can be improved by increased driver conformance to the posted speed (1).

The challenge agencies face is how to improve conformance with the posted speed limit. Many speeding drivers are local residents who are comfortable with the area. These motorists, many times, unconsciously speed through their own neighborhoods. The static speed limit sign alone, while effective in many areas, does not always create the conformance that is desired.

Generally, the concern related to speed conformance manifests itself at locations where the regulatory speed limit changes. These locations, generally involving changes from a higher speed (e.g., 50 mph) to a lower speed (e.g., 35 mph), are often related to a change in the characteristics of the roadway environment. For example, a two-lane highway may have a speed limit of 55 miles per hour. As the same highway enters into a more residential area, the speed limit may drop to 35 miles per hour. Although the amount of traffic is constant, the presence of homes, businesses, and pedestrians necessitates the need for a lower travel speed.

Historically engineers have looked to enforcement tools, either active or passive, as a solution to speeding. Active enforcement entails police vehicles patrolling the roadway writing tickets to speeding motorists. Passive enforcement relies on the motorists to correct their own driving behavior. An example of this is the use of a portable speed trailer placed along a roadway. In both cases, observations have show that once the police vehicle is out of sight or the speed trailer is removed, vehicle speeds return to their previous levels (2, 3).

Engineers have had a limited toolbox when it comes to improving speed limit conformance. Additionally, ideas that once worked, soon become obsolete or lose their effectiveness. Traffic characteristics of roads can change with time and development. Many locations that were once outlying low volume rural roads are seeing significant increases in traffic volume and vehicle speeds as urban areas grow. Conventional tools included the installation of signs and/or pavement markings and the use of high visibility sheeting to increase sign conspicuity. Even with these efforts, many drivers will still exceed posted speed limits.

One new tool that addresses speed issues by combining engineering and education is the Dynamic Speed Monitoring Display (DSMD) sign (Figure 1). DSMD signs are a practical outcome of advances in ITS technology. These traffic control devices are self contained ITS systems that measure the speed of an approaching vehicle using a radar embedded in the sign, then feeding this information back to the driver in real time via a dynamic message display. The DSMD sign encourages the driver to act more safely by adjusting their speed to come into compliance with the posted speed limit. The DSMD sign, permanently installed in conjunction with a standard static regulatory speed limit sign (MUTCD R2-1), provides information to the motorist of the speed at which they should be driving with the static sign and the speed at which they are driving with the DSMD sign – a total package of information that is easy for the driver to comprehend without distraction.

**Figure 1 – Dynamic Speed Monitoring Display (DSMD) Assembly used in this study**


## THE STUDY

Studies have been conducted on the effectiveness of permanently installed DSMD signs in a number of applications, particularly for speed management in school zones and urban traffic calming (4, 5). The purpose of this paper is to report on the results of a long-term evaluation of these devices at speed reduction transition zones, which are those locations where the speed limit changes (transitions) from a higher speed to a lower speed. The study was specifically targeted at locations were a rural highway transitions into an urbanized area. An important objective of this study was to assess the long-term effectiveness of permanently installed DSMD signs. It is well documented that DSMD signs are an effective speed management tool, but the majority of the studies have only evaluated short term effectiveness – typically over the course of a few days to a few months (6, 7). Concerns have been raised that DSMD signs may lose their effectiveness over time as drivers become accustomed to seeing them on a regular basis.

## STUDY DESIGN

The study was conducted as a Before-and-After with Control site design (8). This format was chosen due to the long-term nature of the study. Use of a control (untreated) site chosen randomly from the population of possible treatment sites overcomes the drawbacks associated with simple Before-and-After studies. A control site provides information on both seasonal and long-term variation in traffic. The criteria used to identify the test sites were:

1) Located on county controlled roads within Washington County or Dakota County, Minnesota.
2) Transition from a rural high speed highway to an urbanized area.
3) Reduction in posted speed limit of 10 mph or greater at the transition.
4) Existing history of speed related safety concerns.
5) No other engineering measures planned at the site for at least 12 months.

Five locations were chosen from among a number of potential locations meeting the criteria. Four locations were designated as experimental sites and one as the control site (Table 1). The three sites in Washington County (2 experimental, 1 comparison) were speed reductions from 50 to 30 mph, 55 to 40 mph and 55 to 30 mph (Control) on rural two lane highways as they entered urban areas. The Dakota County locations were located along a single stretch of highway where there were two successive speed transitions. The first transition was from 55 mph to 45 mph followed by a second transition 0.7 miles downstream from 45 mph to 35 mph. All the locations in this study were two lane roads. At each of the experimental locations, the existing R2-1 sign indicating the reduced speed was replaced with an assembly consisting of a DSMD sign mounted directly below the speed limit sign (see Figure 1). No changes were made at the Control site**.**

**Table 1- Study Test Sites**

| **Location** | **Initial Speed Limit (mph)** | **Reduced Speed Limit at Transition (mph)** | **Average Daily Traffic (ADT)** | **Date DSMD Signs Installed** |
|---|---|---|---|---|
| Experimental Sites | | | | |
| Hugo (CSAH 8)<br>Washington County | 50 | 30 | 12,000 | Nov 2004 |
| Bailey (CSAH 18)<br>Washington County | 55 | 40 | 4,000 | Nov 2004 |
| Hastings #1 (CSAH 46 )<br>Dakota County | 55 | 45 | 11,000 | May 2005 |
| Hastings #2 (CSAH 46 )<br>Dakota County | 45 | 35 | 11,000 | May 2005 |
| Control site (untreated) | | | | |
| Stonebridge (CSAH 5)<br>Washington County | 55 | 30 | 5,000 | -- |

Note: CSAH = County State Aid Highway

Dynamic Speed Monitoring Display Assembly

The DSMD signs used in this study were 3M Driver Feedback Signs operating on AC power. These signs conform to the requirements of the MUTCD for changeable message signs that display to approaching drivers the speed at which they are traveling (9). The dimensions of the speed limit sign and the DSMD sign were both 36 inch x 48 inch. This sign size is recommended in the MUTCD for use on higher speed rural highways. The signs used in the study utilize a NEMA TS4 Hybrid dynamic message display that combines Fluorescent Yellow-Green retroreflective pixels with integrated high-output 590 nm InGaAIP LEDs (10). Hybrid displays were chosen to maximize sign target value and legibility under all conditions – day, night and inclement weather. The frame surrounding the hybrid display as well as the face of the R2-1 Speed Limit sign was White ASTM Type IX retroreflective sheeting.

The DSMD used K-band radar embedded within the sign to measure the speed of the approaching vehicles. The signs were programmed to display the speed to the motorist in real time and to flash until that motorist slowed down to at or below the posted speed limit at the transition point. The DSMD signs were programmed with minimum and maximum speed display cut-off limits to discourage reckless drivers attempting to see how fast they could go. These signs also have the capability for vehicle speed data collection; however, this feature was not used for this study.

Data Collection

Limited data for analysis is a common problem in field research. Sufficient data must be collected in order to allow a thorough analysis of the results of the experiment. Vehicle speed and traffic volume data was collected at two positions at each location. The first position, denoted the Advance site, was one-third to one-half mile upstream of the speed limit reduction. The position of the Advance site was chosen such that the DSMD was inconspicuous in the distance. The Advance sites also function as comparison sites since speeds at these locations should not be influenced by the DSMD. The second set of data was collected adjacent to the DSMD sign, which is the point where the reduced speed limit officially begins and where the driver should now be traveling at the new lower speed.

The plan called for the signs to be installed at the same time at all of the sites. Data collection was then to be conducted at all sites simultaneously at defined intervals over the course of one year. These intervals were nominally:

- Before installation of the DSMD sign
- One week after
- Two months after
- Seven months after
- One year after

The original plan was adhered to at the Washington County sites (2 experimental sites and the control site) with only a few modifications due to the Minnesota weather. These signs were installed in November 2004. Installation of the DSMD assemblies at the test location in Dakota County that comprised of two consecutive speed transitions were delayed until May 2005 due to difficulty installing power for the signs during the winter. Due to logistical problems One Week After data was not collected for the Dakota County locations.

This study used commercial pneumatic tube traffic data recorders with electronic data collection to measure vehicle speed and volume. Vehicle speeds were binned in 1 mph increments at 15-minute intervals. All measurements were taken mid-week for 48 to 72 consecutive hours simultaneously at both the Advance and DSMD sign positions. Simultaneous data collection provided a counter balance for day–to–day variability.

**STUDY RESULTS**

In any long-term study, there is natural variation in traffic volume and speed. In order to draw conclusions on the persistent effectiveness of the DSMD signs, a review should be made to check for potential external influences other than the DSMD sign. Table 2 presents the average directional daily traffic volume through each of the sites during the measurement periods. The corresponding Average Daily Traffic (ADT) is approximately twice the volumes listed in the table. With one exception, the data shows the 24-hour average traffic to be relatively stable. The majority of the test sites showed only a two to four percent variation in traffic volume over time with no distinct trend. However, at the Bailey site, there is a consistent increase in volume over the course of the study, which is mainly due to completion of a nearby major construction project.

**Table 2 - Average Directional Daily (24-hour) Traffic Volume through the Study sites**

| Location | Before | 2 Months | 7 months | 1 year |
|---|---|---|---|---|
| Hugo Advance | 6214 | 5614 | 6560 | 5899 |
| Hugo DSMD | 6115 | 5527 | 6385 | 6197 |
| | | | | |
| Bailey Advance | 2107 | 2440 | 3506 | 2720 |
| Bailey DSMD | 2193 | 2450 | 3526 | 2788 |
| | | | | |
| Hastings Advance | 5343 | 5342 | 4914 | 5507 |
| Hastings #1 DSMD | 5863 | 5747 | --[1] | 5924 |
| Hastings #2 DSMD | 5133 | 4940 | 4706 | 5281 |
| | | | | |
| Stonebridge Advance | 2568 | --[1] | 2804 | --[2] |
| Stonebridge Control | 2511 | 2223 | 2754 | --[2] |

Notes: [1]Data lost due to equipment malfunction; [2]Data not collected due to installation of a DSMD sign at this site

The speed data was compiled, reduced and analyzed using both Microsoft ® Office Excel 2003 and Minitab ® Release 14.13 statistical software. A number of descriptive statistics were generated as a function of time and location, including:

- Average speed
- $50^{th}$ (median), $85^{th}$ and $95^{th}$ percentile speeds
- 10-mph Pace

The 24-hour speed results for the control and study sites are summarized in Tables 3, 4 and 5. Statistical analyses were run on the data comparing changes in vehicle speed distributions as a function of time period and location. Significance testing included an analysis of Variance, Z-test, t-test and Odds Ratio. All statistical measures showed highly significant associations (alpha $< 0.01$) between the presence of a DSMD sign and speed reductions within the transition zone. The study sites with the DSMDs experienced reductions in the $50^{th}$, $85^{th}$ and $95^{th}$ percentile speeds averaging 6.3, 6.9 and 7.0 mph, respectively. The 10-mph Pace speeds also decreased at all the DSMD locations. These results indicate the DSMD shifted the entire speed distribution at the transition zone. At the Advance sites and the Control site, the corresponding speeds were either flat or increased slightly over the course of the research.

The data at the Stonebridge Control site was only collected through 7 months. Due to the need to address the existing speed related safety concerns at this location and based on the positive results of this study up to that point in time, Washington County installed a DSMD sign assembly just prior to the One Year After data collection period.

**Table 3 - Results for the Control (untreated) Site**

| | **Mean Speed (mph)** | **Standard Deviation ($\sigma$)** | **Sample size** | **50th Percentile Speed** | **85th Percentile Speed** | **95th Percentile Speed** | **10 mph Pace (mph)** |
|---|---|---|---|---|---|---|---|
| Stonebridge Advance (55 mph) | | | | | | | |
| Before | 52.6 | 6.6 | 7881 | 53 | 59 | 62 | 48-57 |
| 1 week | 50.6 | 6.4 | 7547 | 51 | 56 | 60 | 46-55 |
| 2 months | -- | -- | -- | -- | -- | -- | -- |
| 7 months | 53.5 | 7.0 | 8416 | 54 | 59 | 63 | 51-60 |
| Stonebridge Control (30 mph) | | | | | | | |
| Before | 40.2 | 6.8 | 7739 | 40 | 45 | 49 | 36-45 |
| 1 week | 41.7 | 7.0 | 7397 | 42 | 48 | 52 | 36-45 |
| 2 months | 39.2 | 6.7 | 5712 | 39 | 45 | 49 | 36-45 |
| 7 months | 40.0 | 6.7 | 8290 | 40 | 45 | 49 | 36-45 |

**Table 4 - Results for the Washington County Study Sites**

| | Mean Speed (mph) | Standard Deviation (σ) | Sample size | 50th Percentile Speed | 85th Percentile Speed | 95th Percentile Speed | 10 mph Pace (mph) |
|---|---|---|---|---|---|---|---|
| Hugo Advance (50 mph) | | | | | | | |
| Before | 51.8 | 7.5 | 18403 | 52 | 58 | 60 | 46-55 |
| 1 week | 54.0 | 7.5 | 17699 | 54 | 60 | 64 | 51-60 |
| 2 months | 52.3 | 7.4 | 16979 | 53 | 59 | 62 | 46-55 |
| 7 months | 52.8 | 7.9 | 19203 | 53 | 59 | 63 | 51-60 |
| 1 year | 51.2 | 7.5 | 15199 | 51 | 57 | 60 | 46-55 |
| Hugo DSMD (30 mph) | | | | | | | |
| Before | 44.2 | 7.7 | 18085 | 44 | 50 | 54 | 41-50 |
| 1 week | 37.1 | 8.4 | 17336 | 36 | 44 | 49 | 31-40 |
| 2 months | 36.1 | 8.1 | 16613 | 35 | 42 | 47 | 31-40 |
| 7 months | 37.0 | 8.5 | 18678 | 36 | 43 | 49 | 31-40 |
| 1 year | 36.0 | 6.9 | 16025 | 36 | 43 | 45 | 31-40 |
| Bailey Advance (55 mph) | | | | | | | |
| Before | 50.6 | 6.4 | 6201 | 51 | 56 | 59 | 46-55 |
| 1 week | 51.0 | 14.9 | 6360 | 55 | 63 | 67 | 51-60 |
| 2 months | 51.3 | 6.9 | 7254 | 51 | 58 | 61 | 46-55 |
| 7 months | 50.4 | 7.6 | 10451 | 51 | 57 | 60 | 46-55 |
| 1 year | 50.1 | 7.0 | 5645 | 50 | 57 | 60 | 46-55 |
| Bailey DSMD (40 mph) | | | | | | | |
| Before | 50.9 | 7.2 | 6305 | 51 | 58 | 63 | 46-55 |
| 1 week | 44.6 | 7.9 | 6048 | 44 | 50 | 57 | 41-50 |
| 2 months | 42.3 | 5.4 | 7253 | 42 | 47 | 50 | 36-45 |
| 7 months | 45.7 | 6.4 | 10521 | 45 | 51 | 55 | 41-50 |
| 1 year | 43.3 | 6.4 | 5433 | 43 | 49 | 53 | 36-45 |

**Table 5 - Results for the Dakota County Study Sites**

| | **Mean Speed (mph)** | **Standard Deviation (σ)** | **Sample size** | **50th Percentile Speed** | **85th Percentile Speed** | **95th Percentile Speed** | **10 mph Pace (mph)** |
|---|---|---|---|---|---|---|---|
| Hastings Advance (55 mph) | | | | | | | |
| Before | 52.5 | 7.3 | 9782 | 53 | 59 | 62 | 46-55 |
| 2 months | 49.8 | 7.4 | 10019 | 50 | 55 | 60 | 46-55 |
| 7 months | 49.6 | 7.2 | 8995 | 49 | 55 | 60 | 46-55 |
| 1 year | 50.2 | 7.9 | 10181 | 51 | 56 | 60 | 46-55 |
| Hastings #1 (45 mph) | | | | | | | |
| Before | 52.1 | 7.4 | 10667 | 52 | 58 | 62 | 46-55 |
| 2 months | 47.1 | 6.9 | 10812 | 47 | 52 | 57 | 41-50 |
| 7 months | -- | -- | -- | -- | -- | -- | -- |
| 1 year | 45.9 | 7.9 | 10984 | 47 | 52 | 55 | 41-50 |
| Hastings #2 (35 mph) | | | | | | | |
| Before | 39.0 | 8.6 | 9250 | 39 | 45 | 50 | 36-45 |
| 2 months | 36.0 | 7.9 | 9318 | 36 | 40 | 45 | 31-40 |
| 7 months | 36.0 | 7.9 | 9318 | 36 | 40 | 45 | 31-40 |
| 1 year | 34.5 | 6.8 | 9658 | 36 | 40 | 44 | 31-41 |

## DISCUSSION

There are two basic questions that must be answered in order to determine whether a new traffic control device will be a useful and reliable addition to the engineer's speed management toolbox:

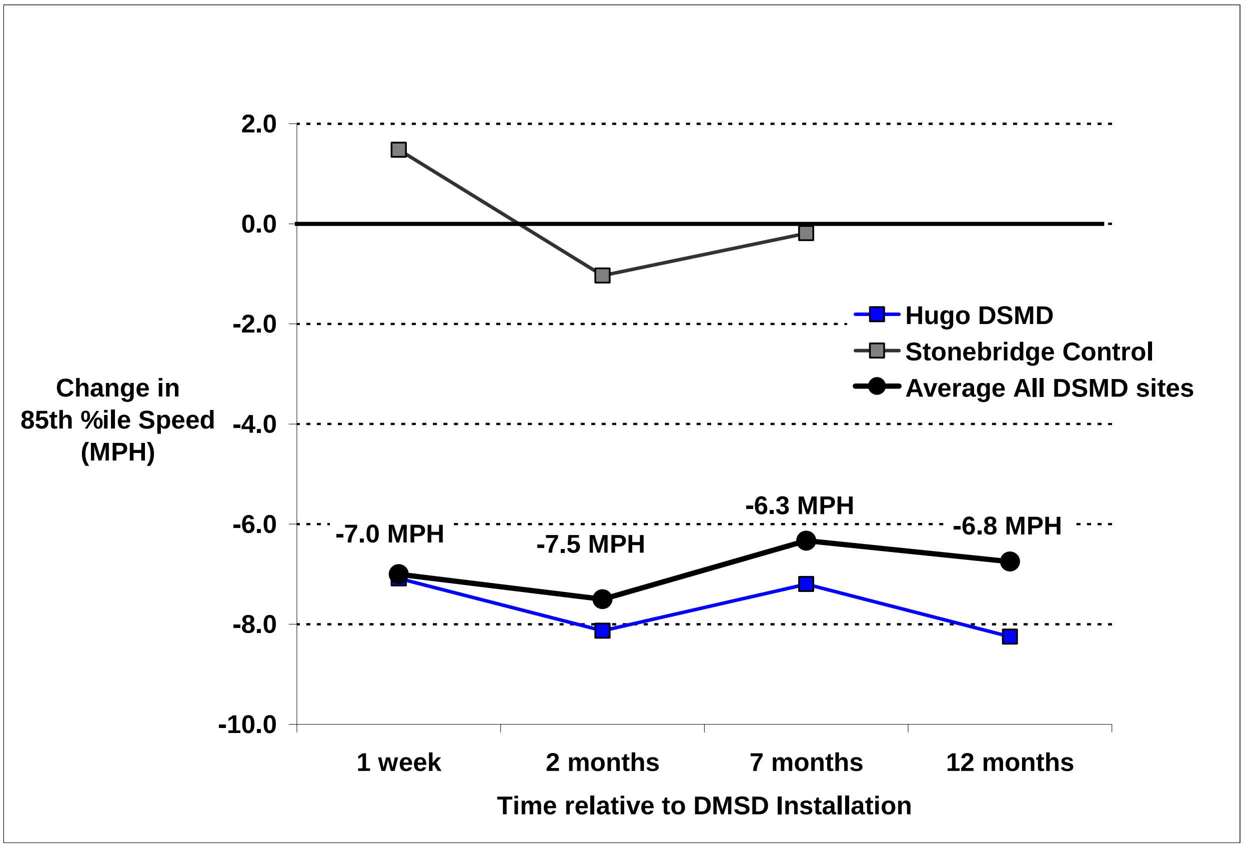
1) In what applications is it effective?
2) Does the device have a persistent effect on driver speed behavior?

The objectives of this study were to address both of these questions. The results of this study were very consistent across all test sites as demonstrated by the data in Tables 3-5. This discussion will use primarily the results from the Hugo locations in Washington County to illustrate the answers to these questions.

Effectiveness for the Application

Recent studies have shown DSMD signs to be effective for speed control at school zones and urban traffic calming. This project evaluated their effectiveness at speed transition zones, particularly where the DSMD sign is used in combination with the regulatory Speed Limit sign. The results of the study show the DSMD sign is an effective tool for reducing speed and increasing compliance at speed transition areas. Figure 2 illustrates the change in 85$^{th}$ percentile speed for the Hugo test site, the Stonebridge control site, and the average speed reduction over all the DSMD locations.

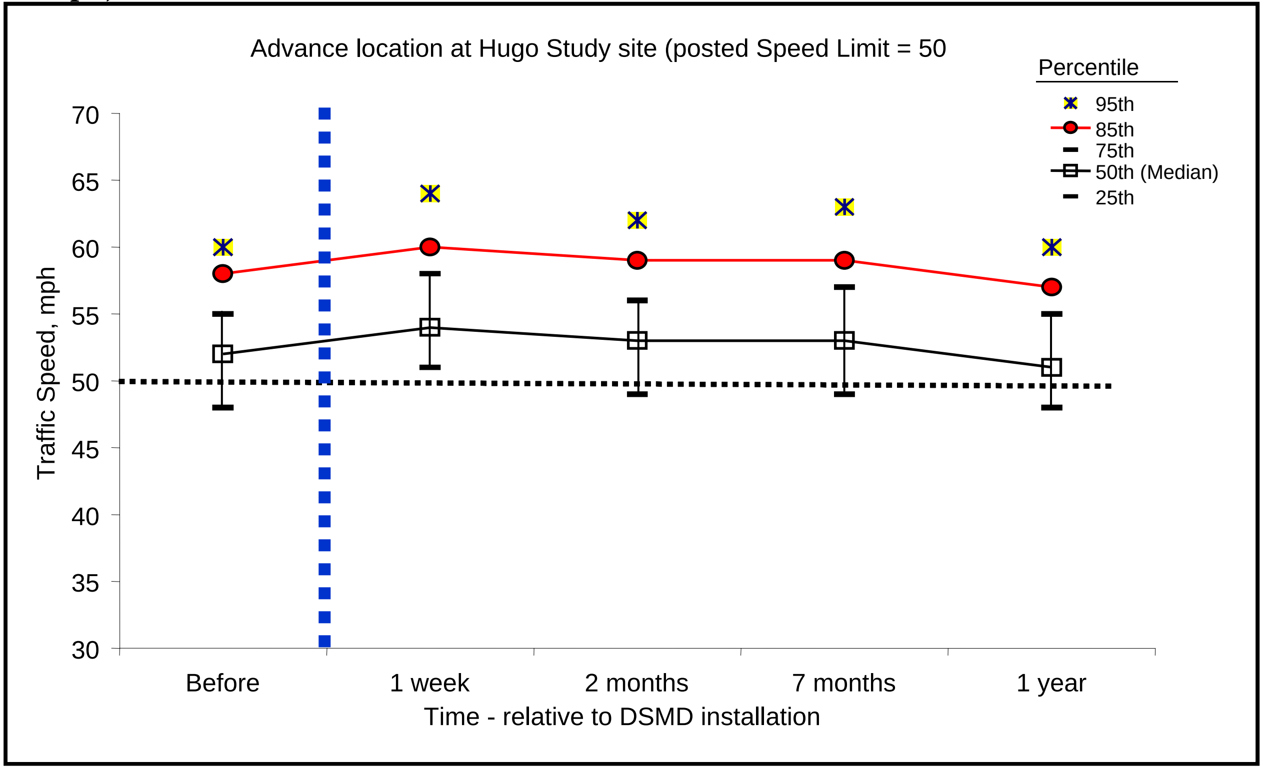
**Figure 2 – Change in 85$^{th}$ Percentile Speed as a Function of Time period.**




Persistent Effect on Driver Speed Behavior

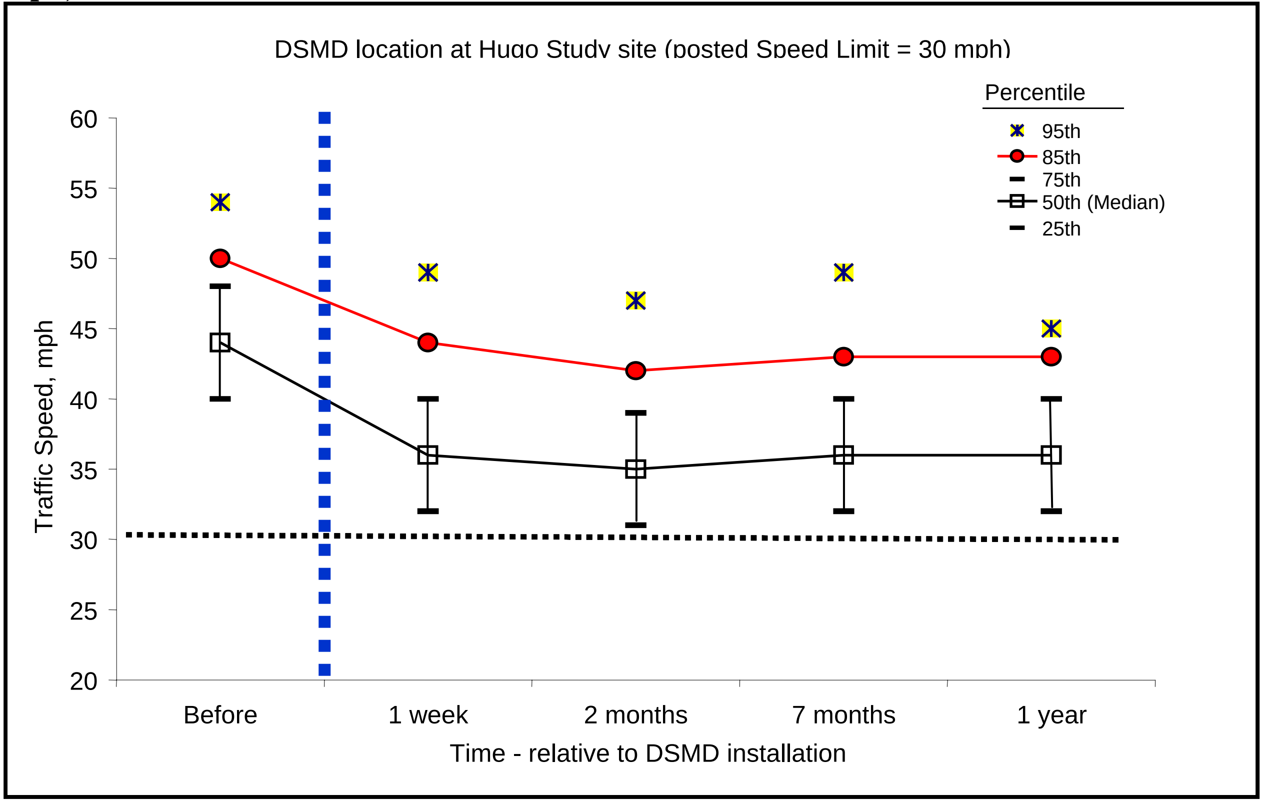
Data was collected over the course of one full year to assess the long-term effect of DSMD signs on drivers' speed. Speed and traffic volume data were collected in advance of the speed limit transition area and at the speed transition prior to installing the DSMD signs and at regular intervals afterwards. Analysis of the data showed both statistically significant and, more importantly, practically significant reductions in vehicle speeds associated with the use of the DSMD assembly. At the Hugo Advance location, the Before 85$^{th}$ percentile speed was 57 mph (posted Speed Limit of 50 mph) and the 10-mph Pace of 46-55 mph made up of 65 percent of vehicles. Over the course of the study period, the 85$^{th}$ percentile speeds remained relatively consistent at approximately 57 mph for each of the time frames (Figure 3).

**Figure 3 - Changes in 24-hour Speed Distribution at the Hugo Advance site (Speed Limit 50 mph)**




At the location of the existing speed limit sign indicating the new reduced speed limit, the 85th percentile speed in the Before period was 50 mph (the posted speed limit is 30 mph) with the 10-mph Pace of 41-50 mph made up of 63 percent of the vehicles. One week after the installation of the DSMD sign assembly, there was a six mph decrease in the 85th percentile speed, from 50 mph down to 44 mph (Figure 4). One year after installation, there was still a seven mph reduction in the 85th percentile speeds relative to the Before period. Not only did the 85th percentile speed decrease and stay down, but all speeds decreased, with the higher speeds (95th percentile) showing an even larger decrease of up to nine mph over time. Additionally, the 10-mph Pace dropped by 10 mph from an initial 41-50 mph to 31-40 mph within the first week and was still 31-40 mph at one year while maintaining essentially the same percentage of vehicles (63% Before versus 64 % After one year).

**Figure 4 - Changes in 24-hour Speed Distribution at the Hugo DSMD Site (Speed Limit 30 mph)**




The data showed the overall results across all the DSMD sign locations were fairly consistent. The study found:

- Speed reductions of approximately 6-8 mph in the 85$^{th}$ percentile speed.
- Decrease of 10 mph in the 10 mph Pace
- Consistent reductions through all time frames including the 24-hour data, AM peak hour, and PM peak hour.
- Consistent shift in the speed distribution to lower speeds.

## CONCLUSIONS

Speeding is and will continue to be a safety concern for users on all roadways. From an Engineering perspective, the toolbox is relatively limited on how to address speeding on roadways. In the past, the use of law enforcement officials has been the main tool to "combat" speeders. An emerging technology, the Dynamic Speed Monitoring Display (DSMD) sign, now provides the Engineer with another tool to utilize. A DSMD sign in combination with a regulatory speed sign provides direct and relevant information to the motorist using the roadway. This information component provides the driver with immediate feedback on their behavior relative to the posted speed.

The goal of this study was to focus on reducing and managing speeds in transition zones where the speed limit changes from a higher speed (e.g. 50 mph) to a lower speed (e.g. 35 mph). The results of the study show that DSMD signs at transitions zones have a significant long-term (one year or greater) positive effect on driver speed. This study found overall decreases in speed of approximate six to eight mph at the transition point.

In addition to the improved speed conformance, the installation of these signs proved extremely popular with drivers, nearby residents and businesses, as well as with elected officials.

With the installation of the DSMD signs, expect:

- A reduction in overall speeds
- Increased conformance with posted speeds
- Positive public/elected official feedback

The DSMD sign in combination with a standard regulatory speed limit sign was found to be an effective long-term speed management solution at speed limit transitions.

## ACKNOWLEDGEMENTS

This project was a collaborative effort between the Washington County, Dakota County and Ramsey County Departments of Transportation. The authors would like to recognize the efforts of Jeff Bednar and the professional staff of SRF Consulting Group, Inc. for coordinating and conducting the data collection. The authors would also like to recognize the participation of David Burns, 3M Traffic Safety Systems, in the design of the experiment and his assistance with the statistical analysis of the data.

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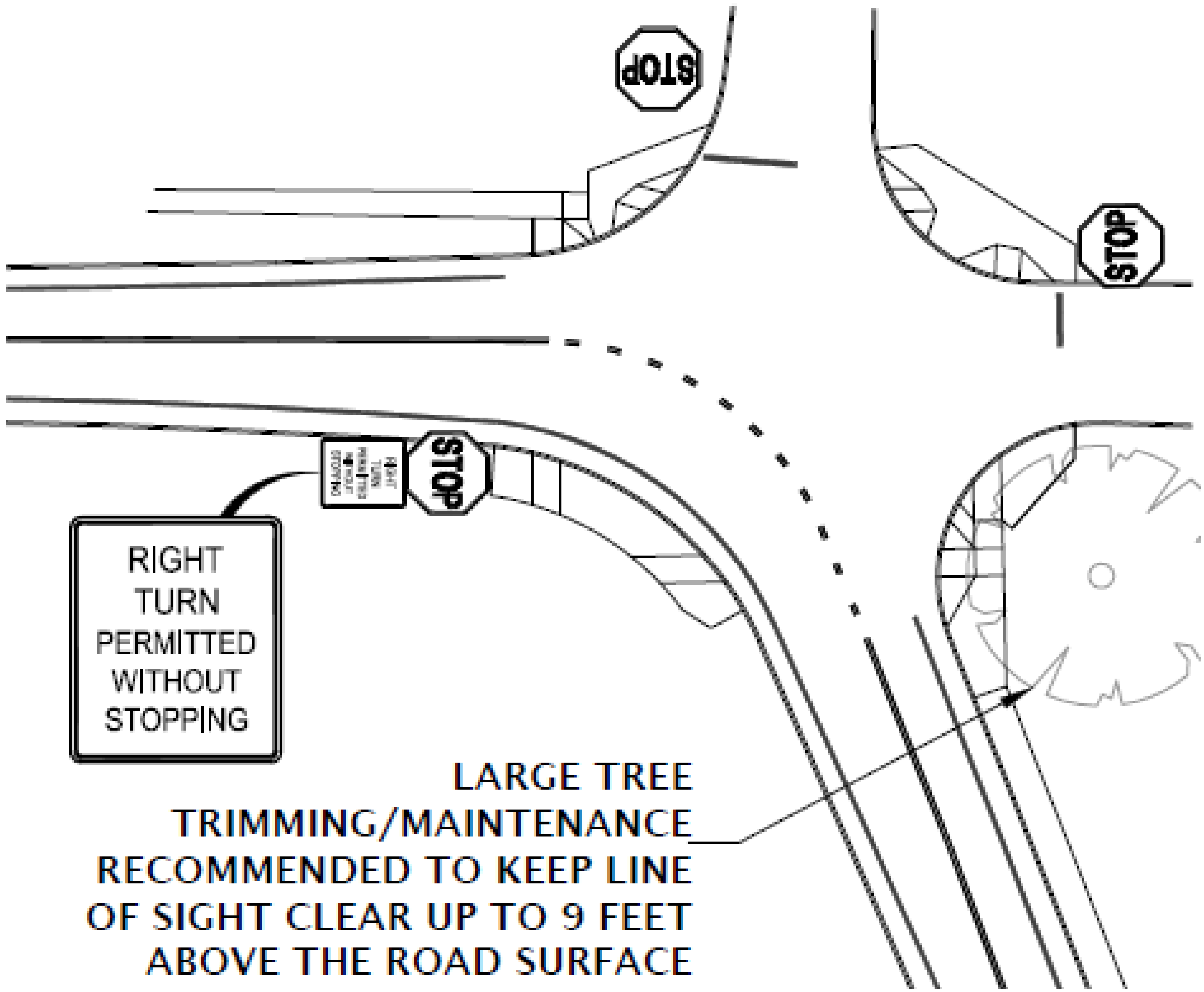

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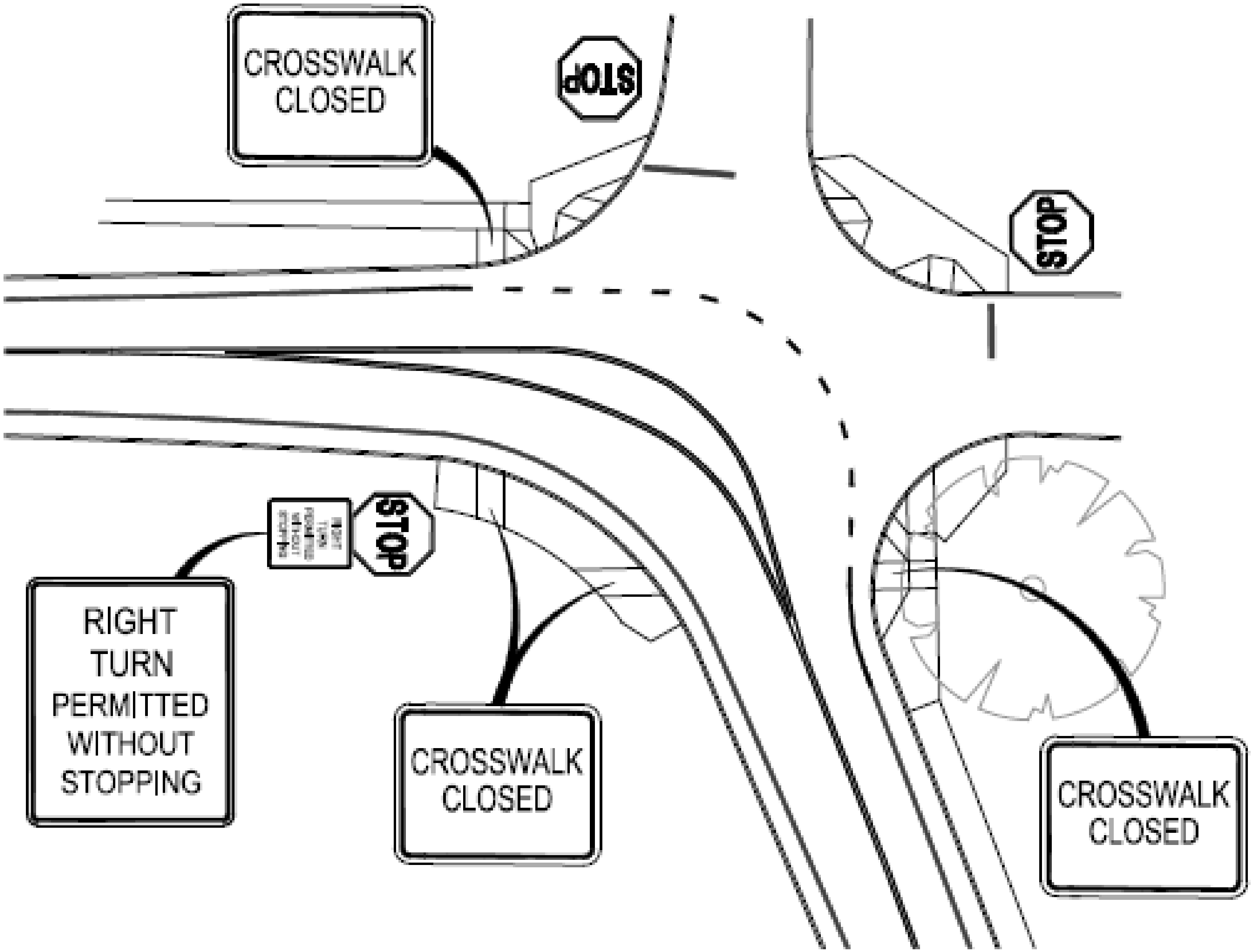

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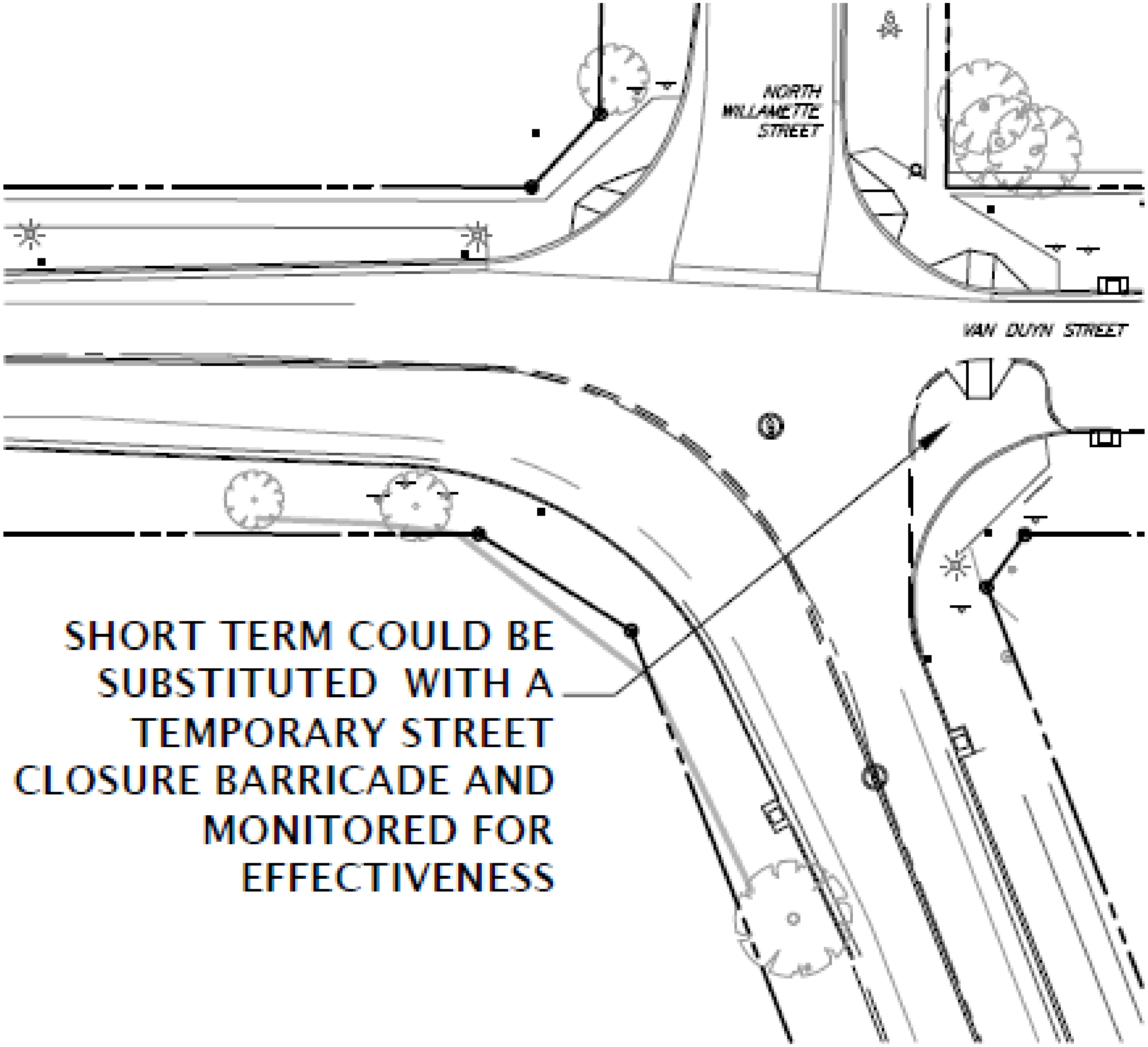


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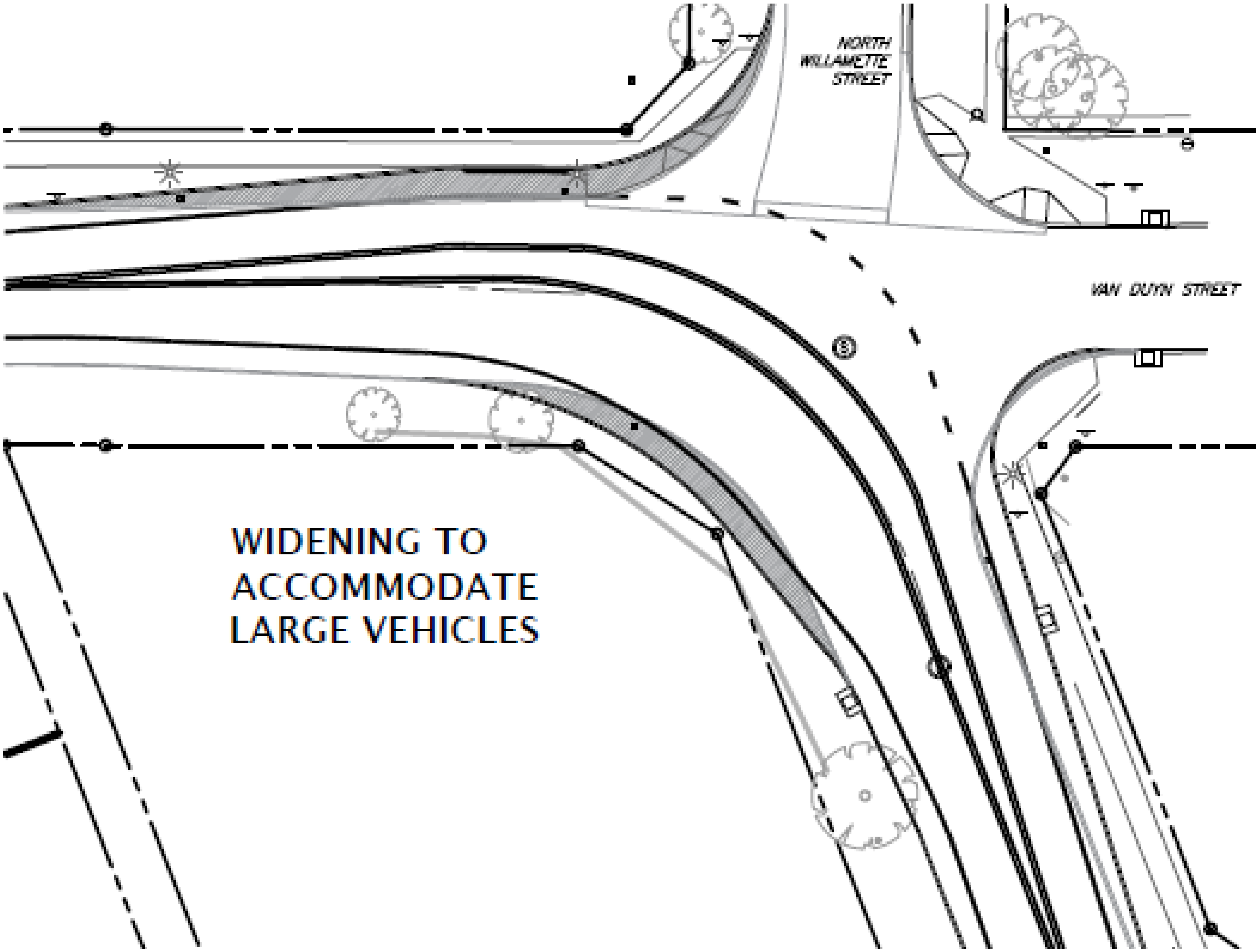
# APPROACH WIDENING AND RESTRIPING



Item 3.

https://www.rv-times.com/localstate/jacksonville-traffic-panel-to-examine-proposed-20-mph-citywide-speed-limit/article_a1ec08a8-50cb-11ee-8eae-cbe97a13664e.html

FEATURED

# Jacksonville traffic panel to examine proposed 20 mph citywide speed limit

By TONY BOOM for the Rogue Valley Times
Sep 14, 2023


A pedestrian crosses Highway 238 in Jacksonville. The town has appointed a traffic ad hoc safety committee to study suggestions made by local residents concerned about traffic issues.

Jamie Lusch / Rogue Valley Time

An ad hoc Jacksonville city committee will look at traffic safety concerns raised by Citizens for a Safer Jacksonville and consider their recommendations.

Chat

Jacksonville Mayor Donna Bowen announced formation of the committee at Sept. 5 City Council meeting and said it should start getting together in October. Bowen, City Councilor Andy Hellenthall and Cindy Rassmussen from the citizen's group are already on the committee, and two more members will be named.



"After discussion with many folks in town, including Cindy's group, I'm appointing the traffic ad hoc safety committee," said Bowen. "We will be able to coordinate all our efforts. We will find out which ideas will work and which won't."

Rasmussen and her supporters have been advocating for changes since the beginning of the year. In May, the group's town hall meeting drew 50 people. She says the committee's suggestions would not have a large financial impact on the city budget.

"At the last council meeting Tuesday they approved $20,000 to fix up the pickleball courts," said Rasmussen. "If they can come up with $20 grand, they can come up with $5,000 to make a huge difference in the safety of the community."

Proposals on the recommendation list include one consistent speed limit for the town, using trained volunteers to operate radar guns and write parking citations, adding more signage and crosswalks, use of mobile speed humps, and banners at town entrances to increase traffic safety awareness.

A single speed limit for the entire town — 20 mph is suggested by the group — the top issue for Rasmussen. Different speed limits in town can be confusing to motorists, she said. ODOT enacted rules in 2022 that enable cities to set their own speed limits.

“Towns are much more able to look at the speed limits rather than snarl up time in the state. I feel it could be the best thing we could do,” said Rasmussen. If the city were to seek a citywide speed limit, it would need to be studied and approved by a traffic engineer, she said.

Crosswalk markings are especially needed where Elm, Applegate and Sterling streets all come together, the group contends. Another location for a crosswalk would be at South Oregon and Applegate streets. Both intersections are close to the Britt Music Festival grounds and become busy with pedestrians and traffic before and after the concerts, she said.

More signage on Fifth Street, the main entrance from Medford, should be in place for pedestrians, said Rasmussen. Seniors live in the area, which is also close to Jacksonville Elementary School.

Speed humps are suggested for streets feeding into the city from hills above the south end of town. Traffic appears to be going faster coming down the hills when it enters city limits.

Item 3.

Low-rise speed humps are suggested for four locations, and they would be installed on a trial basis of six to 12 months. The group recommends purchase of four sets for $680. The humps come with spikes that need to be driven into the pavement to secure the 72-inch-long devices.

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Suggested locations for speed humps include South Third Street near Andrews Place, Applegate Steet near Grant Steet, upper South Oregon Street and on G Street. In an earlier City Council meeting, City Administrator Jeff Alvis said that residents near the humps would need to be consulted.

Rasmussen said she'd also like to see the current parking ticket fee, now $20 per violation, raised substantially. Trained volunteers could write tickets. She's particularly concerned about parking during Britt concerts, when people park on corners and in other illegal ways creating safety hazards.

Volunteers could also be trained to use radar guns to check on speeds. Violators could be sent warning letters, the group recommended. Trained volunteers could also assist the police with charging and moving the current "Your Speed Is" signs around town. The signs show drivers their current speed and are usually placed in residential areas.

The traffic safety group met Aug. 9 with Bowen, City Councilor Kenn Gregg and Alvis about their list of proposals. They had asked for a response by Sept. 15, but have no indication that one will be forthcoming.

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Also serving on the citizens group are Terry and Marjorie Donovan and Janie Tibbals. The Donovan's are interested in using volunteers to operate radar guns. Tibbals walks the town daily and is knowledgeable about signage and crosswalks, said Rasmussen.

A picture of a sign that someone sent her might be appropriate for the town, said Rasmussen. It read: "Drive slow and see our little town. Drive fast and see our little jail."

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