Washington State Department of Transportation

LTAP news

Issue 114 Local Technical Assistance Program in Washington State Summer 2013

Interim approval for devices in Washington State

Ian Macek, WSDOT Highways & Local Programs

Did you know that Washington has received statewide interim approval for both the optional use of Rectangular Rapid Flashing Beacons (RRFBs), and for green colored pavement for bike lanes? Both of these treatments can be used to help increase safety for pedestrians and bicyclists.

Rectangular Rapid Flashing Beacons

Rectangular Rapid Flashing Beacons are a type of active warning beacon that can enhance safety by reducing crashes between motor vehicles and pedestrians or bicyclists. RRFBs increase driver awareness of non-motorized crossings by using an irregular flash pattern, and are typically installed at unsignalized intersections, roundabouts, and mid-block crossings. The beacons can be used to help bicyclists and pedestrians cross either two-lane or multi-lane roadways, and can be activated either manually by a push-button or passively through detection.

In This Issue:

RRFBs are a lower cost alternative to traffic signals and pedestrian hybrid beacons and significantly increase driver stopping behavior at crossings when supplemented by standard crossing warning signs and markings.

Green Colored Pavement

Colored pavement within a bicycle lane increases the visibility of the facility, identifies potential conflict areas, and reinforces priority to bicyclists in the bike lane. Colored pavement can be used as a corridor treatment along the length of a bike lane or cycle track, or as a spot treatment at conflict points, like locations with heavy turning or merging movements, to create a "bike box," or to mark an intersection. The images provide examples of how green colored pavement can be implemented.

A bike box is a treatment installed at the head of a signalized intersection to help avoid conflicts between bicyclists and right-turning vehicles. They provide bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

How do we install either device?

If your agency is interested in using one of the above treatments, and want more information on installation and federal requirements, contact WSDOT by email at WSDOTMUTCDTracking@wsdot.wa.gov or visit our Web page.

Experimental and Interim Approvals for Traffic Control Devices

By Susan Bowe, P.E. and Aaron Butters, P.E., WSDOT Highways & Local Programs

Consider the following hypothetical scenario. At a conference you attended last week, a vendor named Acme Signs displayed a new warning sign designed to alert drivers to gophers crossing the road. The signs are used in the Gopher Islands in a country far away. When you got back to the office on Monday morning, you shared the concept with your public works director. Before you knew it, the director was excited about the idea and wants you to give a presentation at this week's council meeting. You scurry off to do some investigative research for reporting. You soon realize that this could be the answer your environmental design team is looking for. Your agency will extend a roadway across pristine prairie land next spring. And the Giant Gophers in your area will be listed as a threatened species just in time for construction. The trouble is, gopher warning devices are not in the Manual on Uniform Traffic Control Devices (MUTCD) and have not been used in the United States before. What do you do now?

Give the presentation and plan to request approval from the Federal Highway Administration (FHWA) for the use of the sign as an experimental traffic control device. A local or state agency sometimes has the need to test a new traffic control device that has not already been tested for approval through the FHWA. Or they want to test the use

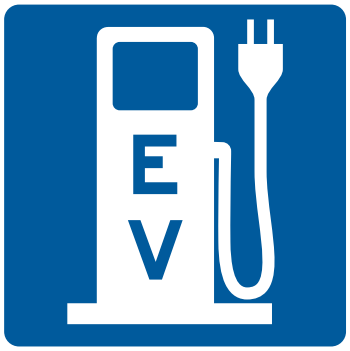
of a device from the MUTCD in a way (different size, type, or location) that has not been tested. In our example, your agency would propose using Acme Sign's sign, or a similar sign you design, at one or more locations in a test situation. If approved for use, your agency would need to evaluate conditions before and after installing the sign.

Let's say that FHWA approves your sign and you used it and find that it successfully warns drivers of gophers crossing the road. You report your results to FHWA. Other agencies in the United States see your research on FHWA's Experimentations Web page and decide to also apply for experimentation to test the device. The devices prove to be successful so FHWA now issues an invitation to all jurisdictions in the United States to apply for interim approval to use the sign at locations that gophers are known to cross the road. An interim approval applies to a traffic control device that has been tested or is in the process of being tested and is being considered for addition to the next edition of the MUTCD. Agencies can either ask for site specific approval or blanket, jurisdiction-wide approval. So thanks to your agency's hard work, Acme Sign's innovation, and other agencies' testing of the sign, gophers throughout the United States will have an easier time crossing roadways.

WSDOT has not yet thought about the use of gopher warning signs. We have, however, received the following blanket approvals for other types of devices, for use by all local jurisdictions in Washington State. A local agency that wants to use one of WSDOT's blanket approvals may do so. The agency must first contact WSDOT by e-mail to notify us that it will use the device under the blanket approval. As a condition of our approval from FHWA, the agency must provide a list of all locations where the traffic control device will be installed. And the agency must also provide an updated list when locations are added or removed. WSDOT's blanket approvals include:

- **IA-11.113: Rectangular Rapid Flashing Beacon**
  For use at uncontrolled pedestrian and school crosswalk locations on state highways and all local jurisdiction roadways. General information, Request letter to FHWA (pdf 143 kb), Approval letter from FHWA (pdf 145 kb).

- **A-12.5: Traffic Signal Photo Enforced Sign**
  For use on state highways and all local jurisdiction roadways.
  General information, Request letter to FHWA (pdf 120 kb), Approval letter from FHWA (pdf 42 kb).
- **1A-13.2: Alternative Electric Vehicle Charging General Service Symbol Sign** For use on state highways and all local jurisdiction roadways.
  General information, Request letter to FHWA (pdf 196 kb), Approval letter from FHWA (pdf 106 kb), View a drawing of the sign (pdf 16 kb).
- **1A-14.20: Green Colored Pavement for Bike Lanes**
  For use on all local jurisdiction roadways.
  General information, Approval letter from FHWA (pdf 121 kb).



This information can also be found on our Web page. For questions, please contact Akmal Siddiqui (360-705-7539 or Akmal.Siddiqui@wsdot.wa.gov) or Ian Macek at (360-705-7596 or Ian.Macek@wsdot.wa.gov).

Do you have an idea for a traffic control device that is not in the MUTCD and a little extra time? Why not apply for an experimental or an interim approval from FHWA? If you've thoroughly investigated the application of the device, chances are that you have everything to gain and little to lose. So gopher it!

Accessible Pedestrian Signals & Pushbuttons: New Document Provides Answers to Questions

By Susan Bowe, P.E., WSDOT Highways & Local Programs

Photos courtesy of Jodi Petersen, Federal Highway Administration, Washington Division

Many local agencies in Washington State are converting from pedestrian signal heads to the countdown style shown in the Manual on Uniform Traffic Control Devices. The countdown style tells sighted pedestrians how long they have to cross an intersection. This improves the signal's communication to these users. Title II of the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act require that the signal also be made accessible to pedestrians with vision disabilities.

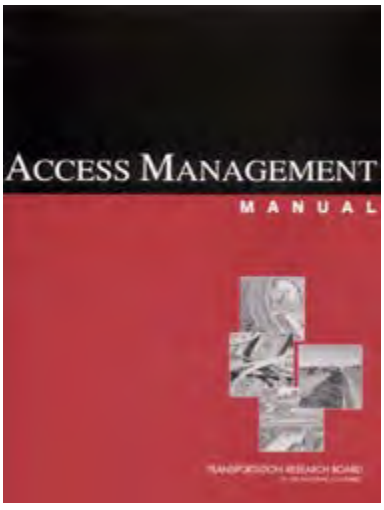
To understand the requirements, Highways and Local Programs posted a new document on our Americans with Disabilities Act (ADA) Web page that provides questions and answers about accessible pedestrian signals and pushbuttons and is available on our website.

Access Management for Local Agencies: Recent Program Review and Webinar Training

By Susan Bowe, P.E., WSDOT Highways & Local Programs

What techniques do local agencies in Washington State use to manage access on their streets and roads? Which of these agencies have access management plans, processes, policies, or guidelines in place? What success stories and challenges have these agencies had with access management? What training on access management do these local agencies desire and in what format do they want it? WSDOT Highways and Local Programs and the Washington Division of the Federal Highway Administration (FHWA) recently set out to find answers to these questions, which we had not studied before. We wanted these answers in order to establish a baseline of understanding for how local agencies in Washington are implementing access management. We were not concerned with compliance.

It is true that on streets designated as state highways, Washington State law, RCW 47.50, requires that access management must meet WSDOT standards, regardless of who maintains the street. However, there are no state or federal laws that require that local agencies manage access on city or county owned streets and roads. Instead, WSDOT and FHWA encourage local agencies to use access management to preserve the operation of existing facilities. According to the Transportation Research Board's 2003 Access Management Manual, "the benefits of access management are achieved through a series of policies that define specific guidelines and standards for allowable



TRB Access Management Manual

access levels, access spacing criteria, access permit procedures, and the means for enforcing these concepts."

In 2012, Highways and Local Programs and the Federal Highway Administration conducted a review to understand the above questions. We surveyed all 281 cities and 39 counties in the state. Although only 28 of the 320 local agencies (approximately 9%) responded, all regions in the state were represented. We learned from these agencies that:

- 27 of the 28 agencies (96 percent) were using a variety of access management techniques, many on multiple roadway functional class types (arterials, collectors, and local roads).
- 18 of the 27 agencies (64 percent of respondents) that had used access management had a plan, process, policy, or guideline to implement it.
- Agencies said that they were interested in more training on access management.
- 75 percent wanted to learn the information from their desk by either reading information or attending a webinar.
- 25 percent wanted to learn the information in a training class or one-on-one from a peer.
- Topics of interest, listed by priority included:
  - » Gaining support from elected officials, property owners (including businesses), and the public.
  - » Planning techniques related to access management.
  - » Developing effective access management policies.
  - » Geometric design techniques for access management.
  - » Traffic signal operation techniques for access management.

Besides giving us a baseline for how access management is being used in Washington State, we were able to accomplish two training-related items thanks to this new information. We rolled out a new Web page on local agency access management and we held a two hour live training webinar in May 2013.

Approximately 100 people from 39 different organizations access the state participated in the training. The webinar topics included:

- Principles of access management
- Local agencies and the politics of access management, including public involvement
- Planning for effective access management
- Access management on Washington State highways
- Case study #1: Aurora Avenue N. (SR 99) in City of Shoreline, Washington
- Case study #2: Downtown and Main St. (US 395) Revitalization in City of Colville, Washington
- Case study #3: Bridgeport Way in City of University Place, Washington

The speakers included experts from the national, state, and local levels. The Highways and Local Programs Local Technical Assistance Program and Traffic Services groups moderated the webinar. For more information on the webinar and the program review, please see our new Web page.

Research Report: Rumble Strips Reduce Injuries and Collisions

By WSDOT Design Research Office

Background

Lane departure crashes on two lane highways, consisting of cross centerline and run off the road to the right (ROTRR) incidents, are of particular concern in Washington State. ROTRR crashes are associated with 30% of all serious injuries and 39% of all fatalities in the state, while cross centerline crashes result in 10% of all serious injuries and 19% of all fatalities. Rumble strips are an important countermeasure for these types of crashes, as they address contributing circumstances such as drivers who are inattentive, distracted, fatigued, or asleep.

In March 2011, the Washington State Department of Transportation's (WSDOT's) Design Policy Research Section published the report, "Performance Analysis of Centerline Rumble Strips in Washington State" (www.wsdot.wa.gov/Research/Reports/700/768.1.htm). This report focused on cross-centerline collisions and also examined the effects of ROTRR collisions where centerline rumble strips (CLRS) had been installed. Centerline rumble strip installations were not expected to reduce these ROTRR events; however, there was a 6.9% reduction in these types of crashes for All Injury Severities, and a 19.5% reduction in Fatal & Serious Injury crashes. Full details on the locations, time periods and performance can be found at the link to the full report.

WSDOT file photo

This research article focuses on the combined performance of shoulder rumble strip and centerline rumble strip installations on the Washington State highway system.

How Rumble Strips Work

Rumble strips are a pattern of depressions installed on the highway centerline or shoulder where an errant vehicle is expected to travel over them. Rumble strips are intended to alert drowsy or inattentive drivers that they have veered from their intended travel path. When a vehicle's tires roll over the depressions, rumble strips transmit noise and vibration through the vehicle, thereby alerting the driver that the vehicle is departing from the travel lane.

Installations

In Washington State, rumble strips are usually milled into the roadway surface. They are installed on the centerline, on the shoulder outside the edge stripe (fog line), or in both locations. Because they are designed to generate vibration through the vehicle, rumble strips impact the comfort and control of bicycles when traversed. Therefore, shoulder usage is a major factor in the consideration of shoulder rumble strips.

Shoulder rumble strips (SRS) are considered only on rural highways where the posted speed is 45 mph or higher, and that have at least 4 feet of usable shoulder between the rumble strip and the outside edge of shoulder (5' of shoulder where guardrail or barrier is present). Other considerations include structural condition of the shoulder, and characteristics of bicycle usage on the route. Most of Washington's undivided highways with SRS also have had centerline rumble strips (CLRS) installed.

Analysis

Several different scenarios present themselves when considering rumble strip performance. Although CLRS and SRS were installed simultaneously in many locations, there are numerous situations where centerline rumble strip installations followed shoulder rumble strip installations, and visa versa. Only locations that had a crash history of at least one year or more before and after rumble strips were

installed were included. Two types of injury crash categories were considered in the analysis, one including all injury types (non-injury, possible injury, evident injury, serious injury, and fatality), and the other involving serious and/or fatal injuries only. This synopsis of the full report describes results as a percent of change in reduction or increase in the crash rates before and after treatment. Where crashes are referenced below, they refer to all lane departure crashes, except where otherwise noted. The crash rates that the performance percentages are calculated from are reported and are available in the full report; "Performance Analysis of Centerline and Shoulder Rumble Strips Installed in Washington State". A selected number of the analyses from the full report are presented below for this article. The full report is linked below.

Locations where SRS was installed first and CLRS installed later

In this analysis, the before condition is CLRS only, and the after condition is a combined CLRS and SRS installation. Forty-one miles of state highway were analyzed, with 42 lane departure crashes recorded in the before period, and 31 such crashes in the after period. Analysis of these locations confirmed expectations that the addition of SRS reduced the rate of both ROTRR and lane departure crashes overall, while crossovers stayed about the same in the before and after case. In these locations, crashes of all injury severity saw a 38% decrease in the rate of all departure collisions, and a 32% decrease in the rate of serious injury/fatal collisions. In considering contributing circumstances, the report notes a 75% reduction in the rate of all asleep/fatigued crashes, and 57% reduction in the rate of all inattention/distracted crashes.

Locations where SRS was installed first and CLRS installed later

For this part of the analysis, the before condition is SRS only, and the after condition is a combined CLRS and SRS installation. Thirty-nine miles of state highway were analyzed, with 40 lane departure crashes recorded in the before period, and 39 such crashes in the after period. Analysis of these locations confirmed expectations that the introduction of CLRS reduced the rate of cross centerline crashes. Crashes of all injury severity types saw a 45% decrease in all departure collisions, with a 43% decrease in the occurrence of serious injury/

fatal collisions. There were considerable reductions in crash rates recorded in those contributing categories where a CLRS installation was expected to have the greatest effect, such the as Asleep/Fatigued category (92% reduction in collision rate) and the Inattentive/Distracted category (76% reduction in collision rate). Although ROTRR crashes were reduced by 15% where speed was a contributing circumstance, and overall ROTRR crashes remained roughly the same (9% increase in collision rate), ROTRR crashes with other contributing circumstances such as asleep/fatigued and inattentive/distracted did see an increase in crash occurrence. The report shows, however, that the reduction in cross centerline crashes overshadowed increases in some of these ROTRR categories.

Locations where CLRS was installed first and SRS installed later

In this analysis, the before condition is CLRS only, and the after condition is a combined CLRS and SRS installation. Forty-one miles of state highway were analyzed, with 42 lane departure crashes recorded in the before period, and 31 such crashes in the after period. Analysis of these locations confirmed expectations that the addition of SRS reduced the rate of both ROTRR and lane departure crashes overall, while crossovers stayed about the same in the before and after case. In these locations, crashes of all injury severity saw a 38% decrease in the rate of all departure collisions, and a 32% decrease in the rate of serious injury/fatal collisions. The reduction in the rate of all crossover collisions (7%) is considerably less than the reduction in the rate of ROTRR collisions (47%), although the reduction of fatal/serious ROTRR crashes is somewhat less (15%). In considering contributing circumstances, the report notes a 75% reduction in the rate of all asleep/fatigued crashes, and 57% reduction in the rate of all inattention/distracted crashes.

Locations where there were no rumble strips in the before period compared to combined CLRS &SRS in the after period

In this part of the analysis; the before condition is no rumble strips, and the after condition is a combined CLRS and SRS installation. This analysis combines the locations where collision data was available, but confines the entire analysis to

a no rumble strip before condition. One hundred thirty six miles of state highway were analyzed, with 373 lane departure crashes recorded in the before period, and 72 such crashes in the after period. The report confirms the expectation that a combined CLRS and SRS installation is effective at reducing lane departure crashes, with crash rate reductions in all measured contributing circumstances and roadway conditions. In these locations, crashes of all injury severity saw a 66% decrease in all departure collisions and a 56% decrease in occurrence of serious injury/fatal collisions. There were considerable reductions in crash rates in a number of contributing circumstance categories, including the asleep/fatigued category with an 84% reduction in lane departure collision rate, 87% reduction in crossovers, and 81% reduction in ROTRR.

Conclusion

Both centerline and shoulder rumble strips are effective, low-cost tools in reducing the rate of lane departure collisions. This study confirmed the premise that rumble strips are effective in reducing lane departure collisions when installed in accordance with WSDOT's design standards.

Where can I find the report?

Both centerline and shoulder rumble strips are effective, low-cost tools in reducing the rate of lane departure collisions. This study confirmed the premise that rumble strips are effective in reducing lane departure collisions when installed in accordance with WSDOT's design standards.

This article is based entirely on: "Performance Analysis of Centerline and Shoulder Rumble Strips Installed in Washington State", a report posted and available on the WSDOT Research website at the following link.

www.wsdot.wa.gov/research/reports/fullreports/799.1.pdf

For more details and contact information regarding the WSDOT rumble strip program please visit:

www.wsdot.wa.gov/Design/Policy/RumbleStrips.htm

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The Manual on Uniform Traffic Control Devices Will Not be Split in Half

By Susan Bowe, P.E., WSDOT Highways & Local Programs

Picture a brick being broken in half by the skillful hand of a tae kwon do artist. That won't happen to the Manual on Uniform Traffic Control Devices (MUTCD).

In January 2013, the Federal Highway Administration asked for comments on turning the MUTCD into two documents. One document would contain content that can only be changed through rulemaking and would contain supporting information. Comments were due in mid-March and the agency received and read 169 letters from local and state agencies, consultants, vendors, associations, and citizens. By June, it was clear to FHWA that as a whole, these parties did not think that it would be useful or appropriate to split the document, at least at this time. If the document is split, it should incorporate the recommendations of an existing strategic planning effort by the National Cooperative Highway Research Program (NCHRP). NCHRP expects this effort to be published in January 2014. As a result, FHWA issued a response to comments on June 17, 2013, stating that the document would not be split, but that FHWA will look for ways to make the

WSDOT Highways and Local Programs Traffic Services can assist local agencies with questions about the 2009 MUTCD, as modified by WAC 468-95. Please contact Susan Bowe, P.E., at 360-705-7380 or susan.bowe@wsdot.wa.gov.

document easier to use for all stakeholders. Goals are to create a simple, clear, concise manual that is useful and appropriate, can meet tort liability needs, can be easily updated, and meets the printed or online format needs of users.

SAVE THE DATE

2013 Washington Asphalt Conference

Thursday, November 14th, 2013 (9:00 AM to 3:30 PM)

Best Western Plus Evergreen Inn and Suites Convention Center Federal Way

The Washington Asphalt Pavement Association, American Public Works Association and the Washington State Department of Transportation are presenting the **2013 Washington Asphalt Conference**.
This premiere technical conference will be held at the Best Western Plus Evergreen Convention Center in Federal Way on November 14, 2013 from 9:00 AM to 3:30PM.

The goal of this one day conference is to provide up-to-date information for those planning, designing, constructing, and managing asphalt pavements.

WHO SHOULD ATTEND:

This conference is intended for managers, engineers, consultants, city and county public works departments, technicians, inspectors, and others who are involved in the planning design, construction, and maintenance of asphalt pavements. This conference has been specifically designed to provide professionals with the practical resources to help ensure they provide long-lasting, high-quality asphalt pavements.

THIS PROGRAM WILL COVER THE FOLLOWING TOPICS:

- **Map-21 Performance Measures - How it affects cities and counties**
- **APWA –Specifications 5.04 Rewrite**
- **Thinlay Asphalt for Pavement Preservation**
- **Design/ Build Projects:**
  Quality Control, Quality Assurance and Quality Verification (QC, QA and QV)
- **Mechanistic-Empirical Pavement Design Guide (MEPDG): Removing the Myth**
- **Low Impact Development with Porous Asphalt**
- **Warm Mix Asphalt Pavements**
- **Recycled Asphalt Pavement (RAP) and Recycle Asphalt Shingles (RAS)**
- **Building a Quality Asphalt Pavement –Panel Discussion**

Check the website for registration information at: www.asphaltwa.com

Registration Fee: $175.00

This includes lunch, refreshments, and all seminar materials.

Contact information on conference:
E-mail: bob@glennconsultinginc.com
Phone: Bob Glenn 360-701-7157
Fax 360-539-7964
Web Site: www.asphaltwa.com

Mailing address:
Washington Asphalt Pavement Association
724 Columbia St NW, Suite 245
Olympia, WA 98501

Infrastructure Assistance Coordinating Council

SAVE THE DATE!

2013 IACC Conference

October 22-24, 2013

Wenatchee
Convention Center

Training sessions and technical assistance for your infrastructure projects.

Now excepting 2013 award nominations.

*Look for registration to open this summer.

Sponsorship opportunites are available.

For more information, contact: Janea Eddy
360.725.3151 or janea.eddy@commerce.wa.gov

Look for more information coming soon!
www.infrafunding.wa.gov

Yakima Convention Center | Yakima, WA

Don't Delay Register Now

2013 Topics Include

Leadership
Asphalt
Traffic Solutions
Asset Management
Environment
Snow & Ice
Public Awareness
Tunnel Project

View the **Conference Agenda** for more details

Early Registration Ends Monday, September 23rd

Conference Attendee
$359 - Traffic Solutions & Road & Street
$109 - Traffic Solutions ONLY

Register Now

Interested in being a Vendor?
Click on Here

Additional information can be found on the **conference website**

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Washington State Department of Transportation

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