WSDOT

news

Issue 121 Local Technical Assistance Program in Washington State Quarter 2 – 2015

$ It Is All About the Money $

By Chris Keegan, PE, WSDOT Olympic Region Operations Engineer

I was asking around about what to say in this bridge article and Ruth McIntyre hit it on the nose. Talk about the money. Whether it is bridge design, Bridge Asset Management, Bridge Preventive Maintenance or what you use to measure performance it is about the money. How do you get it, how do you keep it, and how do you keep from wasting it?

Bridge Design

Robust bridge design will reduce long term cost. The owners need to determine what the lowest life cycle cost design is for the bridge. Lowest life cycle cost takes into consideration the bridge's long term preservation and maintenance requirements. If the bridge is located in an area that uses chlorides for winter maintenance they should treat the concrete on the decks, under joints, and in the splash zones. These treatments are inexpensive and add life to the bridge. Top deck steel should be epoxy coated, or on some larger structures with high ADTs, stainless steel should be seriously considered. If studs are allowed on tires in the winter, a sacrificial overlay should be considered where there is significant winter traffic. Idaho has a study out that shows that treating the decks with a water proofing agent at the start and then following up with a polyester overlay a year or so later after the cracks have developed, shows promise in extending the life of the decks.

Urban design must be considered in cities. It becomes difficult and expensive to inspect and do maintenance on bridges that are also homeless shelters. Flat walls are targets for graffiti and thought needs to be taken to reduce the size, or eliminate walls where possible. If they are necessary the walls should be treated with an anti-graffiti coating. Drainage should be located off the bridge. Bridge joints are a continuing maintenance problem. There are bridge designs out now that move the expansion to the approach slab. The lesson here is that a small additional increase in funding will lead to a less expensive bridge to maintain in the long term.

In This Issue:

Bridge Asset Management Plan

Section 1106 of MAP21 requires an Asset Management Plan for bridges.

Bridge asset management requires good data that includes:

1. An inventory of bridge elements including their age and condition.
2. The preservation and maintenance activities that will prolong the life of the asset.
3. The frequency of the preservation activities as well as the costs of the actions. These may be bridge specific depending on traffic, location, age, and type.
4. The relative priority of the actions as well as the agency's priority list of bridges.

From the data you can then derive the cost to implement the plan including preventive maintenance, corrective maintenance, rehabilitation, and replacement. Comparing the plan cost to the funding available will give you the gap in cost to implement your plan.

You can then use the gap in funding to request additional funds for the bridge program. The argument to use is that you pay a little extra now or a whole lot later. Keeping good bridges in good condition is a lot less expensive than rehabilitation or replacement.

What Gets Measured Gets Funded

MAP 21 also requires that Performance Measures be tied to your Asset Management Plan. It is important that you carefully select the performance measures you will use. These will likely dictate what will be funded in your program. The performance measures should be broadly based and focused on keeping bridges in good condition. Many owners have used the percent of structurally deficient (SD) bridges in their inventory as their measurement. The problem with using SD is that your bridge program becomes a bridge replacement program. It is far more cost effective to direct the funding towards keeping your bridge in good condition.

In the Washington State DOT we had a measurement of the percent of priority 1 bridge repairs completed within a year of notification. The legislature provided additional funds to meet a C level of performance or 70% of the priority 1 repairs completed. This was a victory of sorts but did have its drawbacks. Many crews focused their efforts on getting the priority 1 repairs completed and their preventive maintenance activities for bridges received scant attention. Some of the crews tried a more balanced approach of doing both corrective as well as preventive maintenance activities. It is a little early to tell, but the trend appears to show that the crews with a more balanced bridge preservation approach are seeing fewer priority repairs. The funds saved allowed at least one crew to do minor rehabilitation work that has led to the removal of weight restrictions on several bridges.

Don't Forget the Orphans

The sub-Committee on Bridges (SCOBs) calls them ancillary structures. They are the large sign structures, the retaining walls, the culverts, and the high mast luminaires. FHWA does not require that they are inspected. Most entities do not have a program of maintenance and replacement for these structures. They have to fail before anyone pays attention. It is in everyone's interest to inspect these regularly and have a plan for maintenance, preservation and replacement. Nothing lasts forever. It would behoove us to be proactive rather than wait for something to happen that forces us to take action.

Bridge Preservation Measures

I have attached a non-comprehensive list of activities to this article. I have not included the myriad repairs that a crew may be required to perform. Instead I have included mostly preventive maintenance activities. Some are purely preventive and some are both corrective but also serve a preventive role. How often these activities are performed is unique to each bridge and should be decided by the entity that manages the bridge. This also goes for the priority. In the upcoming Western Bridge Preservation Partnership (WBPP) meeting in Portland there will be a peer exchange session where small groups will work on building a bridge preventive maintenance program. At the end I am hoping that there will be a more comprehensive list of maintenance work.

Communicate the Need for Bridge Preservation

Don't rely just on your public relations office to promote the need for additional funds for our highway system. Talk to your friends, family, and neighbors. Be a guest speaker at a club. Work with your public Information Office on stories about your bridges, both good and bad. Write an article for the LTAP Newsletter. Send in articles to trade magazines. If you get stuck in front of a TV camera, take the opportunity for a sound bite on the need for additional funding to keep our roads and bridges from deteriorating. There should be no more ardent proponent of better roads and bridges than you.

It is all about the money and each of us must do our part to get it, keep it, not waste it and find ways to get more of it until bridge preservation is adequately funded.

Priority	PM/CM	Common Activities	Bridge Types	Typical Frequency (Years)
	PM	Sweeping, cleaning and pressure washing, including maintaining and cleaning any deck drains	All	0.5 - 1
	CM	Weld steel grated decks	Steel decks	As needed
	PM/CM	Reseal/repair deck joints	All	5 yrs or as needed
	CM	Patch deck spalls	Concrete decks	As needed
	PM	Apply waterproofing sealer (silane/siloxanes)	Concrete	3 - 5
	PM	Applying penetrating crack seal	Concrete	10 - 15
	PM/CM	Applying crack filler (healer/sealer)	Concrete	10 - 15
	PM/CM	Applying thin bonded polymer overlay	Concrete Decks	10 - 20
	CM	Applying rigid concrete overlays	Concrete Decks	20 - 30
	PM/CM	Applying bituminous overlay (asphalt with waterproofing membrane)	Concrete decks	15 - 20
	PM/CM	Application of impressed current cathodic protection system	Concrete	One time/ongoing maintenance
	PM/CM	Installation of galvanic anodes for corrosion protection	Concrete	10
	CM	Tighten loose fasteners	Steel members	As needed
	CM	Replace missing fasteners	Steel members	As needed
	PM	Clean and paint or metalizing	Steel members	20 - 30
	PM/CM	Treat with fumigants	Timbers	10
	PM/CM	Apply preservatives	Timbers	10
	CM	Replace or encapsulate damaged timbers	Timbers	As needed
	PM	Remove LWD from piers	All in water	As needed
	PM/CM	Caulk cable bands, saddles & other connection points	Suspension	15 - 20
	PM/CM	Repaint or remove and replace cable wrapping	Suspension	15 - 20
	CM	Replace suspender cables – consult an engineer	Suspension	50
	CM	Repair fatigue cracks in steel	Steel members	As needed
	PM	Dampen cable vibrations – consult an engineer	Suspension	As needed
	PM	Cable dehumidification	Suspension	One time/ongoing maintenance
	PM	Remove vegetation	All	1 - 5
	CM	Replacing missing/loose seismic restrainer fasteners	EQ system	As needed
	PM	Adjusting seismic restrainer cable tension	EQ system	As needed
	PM	Bird netting	All	As needed/ requires maintenace
	PM	Bird Spikes	All	As needed
	PM	USDA/ APHIS	All	Annual cost

Right of Way (ROW) Requirements: New Tools Are Now Available

by Dawn Fletcher, Local Agency & Consultant Reviewer, Local Programs ROW Services

In a recent newsletter article I discussed an effort we were making to develop a "Property Rights Flowchart" to ensure adequate property rights were being acquired to construct, operate, and maintain federal-aid projects.

The flowchart has evolved. The original intent was to develop a flowchart to assist Local Public Agencies (LPAs) determine the circumstances that "mutual benefit permits" could be used. Throughout the process it became evident that it's not always clear for project managers, engineers, and LPA officials to determine when a Right of Way (ROW) phase is, in fact, needed. The result was the creation of two individual, comprehensive flowcharts which clarify how to determine ROW requirements:

1. *Determining Whether or Not Land or Property Rights or Interest (ROW) are Needed*; and
2. *Determining the Type of Property Rights Necessary*.

The three most common areas of confusion have been:

1. Recognizing when a ROW phase is needed, (definition of existing ROW);
2. Recognizing that previous locally funded acquisition constitutes a ROW phase and triggers the requirement to complete Appendix F of the ECS (advance/early acquisition); and
3. Recognizing when the use of "mutual benefit permits" is appropriate (compliance with acquisition requirements for temporary project impacts).

Local Programs anticipates the tools will be helpful and quick for LPAs to use when completing the project prospectus. It should be noted that property right determinations require technical expertise that should be left to qualified ROW staff.

The Local Programs Right of Way group introduced them at three statewide training webinars in March of this year. If you missed the training, there is a recording of it and the question/answer log posted on the LTAP webinar page at www.wsdot.wa.gov/LocalPrograms/Training/Webinars.htm.

We have also recently created an email distribution list through "GovDelivery" with contacts from each of the Region Local Agency Coordinators. Watch for future announcements for training opportunities in an area near you.

If you would like to be added to the mailing list, you may register here or you can email your request to either Dawn.Fletcher@wsdot.wa.gov or Dianna.Nausley@wsdot.wa.gov.

We are very excited about the changes we have implemented and the progress we have made since moving ROW into the Local Programs Division of WSDOT.

New Roadway Marking Materials for a Dynamic World

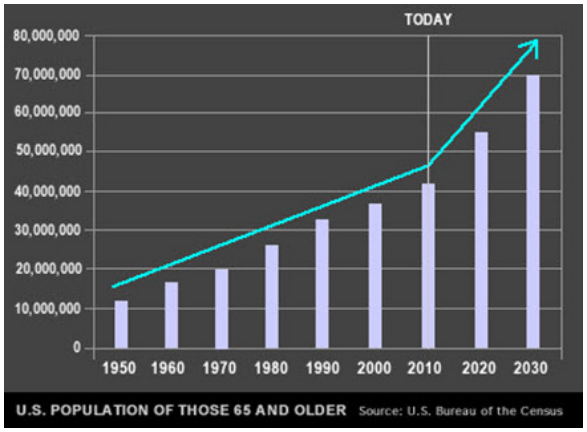
New Beads and Faster Drying Paint

Doug McClanahan, WSDOT and
Melanie Williams, Washington Department of Enterprise Services

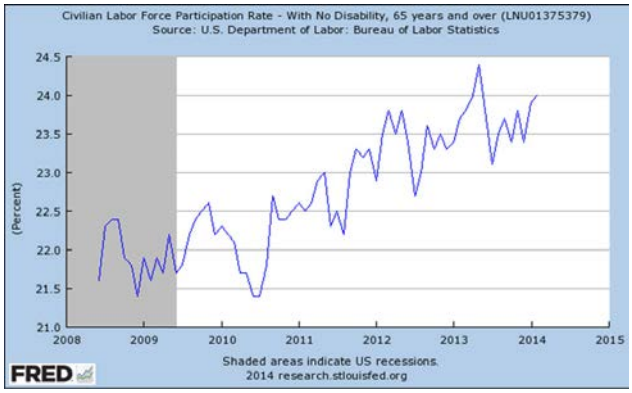
Pavement makings have traditionally consisted of standard road paint and glass beads. However, paint can take a while to dry on cool, humid, or windless days and reflective glass bead material used with road paint was difficult to see at night when the road was wet. A new state contract (# 02513) is now available for local governments to purchase beads that work well at night when wet and a product that dries paint faster.

Reason for the New Material

As a society, we're getting older and projections are that this trend will accelerate. The US Bureau of the Census reports that by 2020, there will be over 50 million drivers aged 65 or older and more of them are working longer. This equates to about one in five drivers!

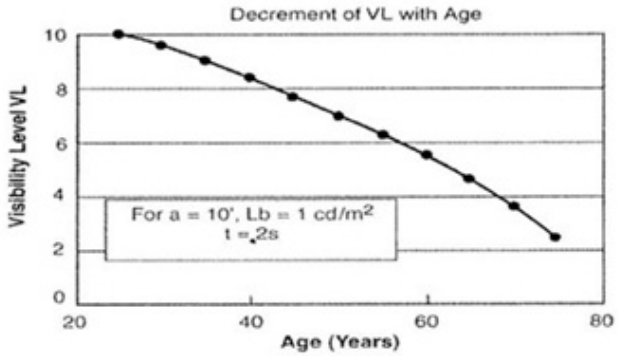


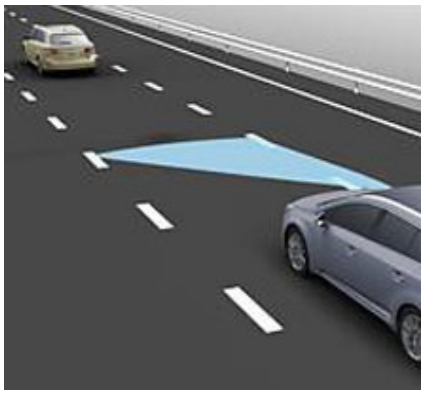
Trend line for older americans



Trend line for older workers/commuters

As we age, our eyes tend to deteriorate considerably, which means it becomes more difficult to adjust to varying light conditions. This affects the ability of older drivers to see well during twilight or darkness.





Toyota

But people aren't the only ones trying to see the road. Vehicles too, are beginning to need roadway markings due to manufacturers' wide-spread adoption of such technologies as lane keeping, lane assist, adaptive cruise control, and stability control.

WSDOT understands the challenges of changing demographics and technologies as well as the benefits of more positive all-weather roadway guidance, day and night, wet and dry. However, for much of recorded automotive history, roadway marking materials have not been very visible to anyone during rainy nights. The reason is that traditional glass beads applied during striping jobs couldn't be designed to function well in wet weather conditions.

The roadway marking industry has responded to this confluence of issues with new and effective products. These new beads can be used with many striping materials (paint, methyl methacrylate, or thermoplastic) and they can aid drivers and vehicle sensing equipment with more detectable wet night roadway markings and stripes.

Although these marking materials have been available for a few years, they haven't been available to state or local agencies via state purchasing contracts. That changes this year.

New State Materials Contract–Available to Local Agencies

Local agencies can now purchase wet weather retroreflective roadway marking beads via the new Department of Enterprise Services roadway marking materials contract. This contract also includes the ability to purchase paint drying agents which allows for a longer maintenance season and painting activities during longer parts of the day. For potential funding, contracts, and contact information, visit:

- http://www.wsdot.wa.gov/LocalPrograms/ProgramMgmt/funding.htm
- https://fortress.wa.gov/ga/apps/ContractSearch/ContractSummary.aspx?c=02513

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References:

https://research.stlouisfed.org/fred2/graph/?s[1][id]=LNU01375379

http://www.census.gov/

Cleaning the State Route 305 Agate Pass Bridge

(aka - They said it couldn't be done.)

Washington State Department of Transportation

By Claudia Bingham-Baker, Olympic Region Comm. Manager

Conditions before

BACKGROUND

The Olympic Region bridge maintenance crew has been systematically hand-cleaning and flushing all the steel truss bridges in the region. The Agate Pass Bridge on SR 305 was one of the last truss bridges to be cleaned. Bridge cleaning and repairs had been deferred due to high traffic volumes leading to very short windows for daytime lane closures and bridge work.

The bridge was last cleaned and painted in 1991, almost a quarter century ago. In that time, impressive amounts of dirt had built up on the bridge members, preventing adequate fracture-critical inspections by State Bridge Inspectors. They needed to see the steel to inspect it.

PREPARATION

The bridge crew worked with the regional Traffic Office to determine the best times for lane closures that would allow extensive cleaning, repairs and inspections of the bridge. They also consulted with the State Ferry System to determine traffic volumes on the Bainbridge Island/Seattle ferry boats runs, and to choose work times that had the least impacts to ferry users. This led to a possible window of work of 8:30 a.m. to 3 p.m. on weekdays, and from 7:30 a.m. to 3:30 p.m. on weekends.

The bridge crew then determined that by using three Under Bridge Inspection Trucks (UBITs), the full bridge crew and the region's Work Zone Traffic Control Crew for traffic control, they could clean and flush the bridge, and do some deferred maintenance, in 14 consecutive days. The Bridge Inspectors could then add a few more days to the work schedule to do an in-depth fracture-critical inspection.

That was the easy part. The next step was convincing drivers to avoid the bridge during work hours, and convincing local jurisdictions and elected officials that the daytime work and lane closures were necessary. We enlisted our regional Communications Office, which came up with a plan and got to work. We knew that normal traffic volumes would result in unbearable traffic jams, and that we needed help from the public for this effort to be a success.

Communications staff took a few unusual steps as part of the outreach. They created a project web page, a resource normally reserved for construction projects, to help explain to the public why daytime work was needed. They coordinated a meeting of the Regional Administrator for Maintenance and Operations, the Regional Operations Engineer and Washington State Ferries with representatives from area utilities, emergency response, law enforcement, a tribe, transit, local elected officials and others that would be directly affected by severe backups.

At this meeting, WSDOT staff got considerable criticism about the plan for doing the work during the day.

Following the meeting, we analyzed the feasibility of some suggestions provided by the various attendees. In the end, we decided the best option was still to move forward with daytime work as planned. We also agreed to another meeting between local key personnel and WSDOT bridge and traffic control supervisors.

At each meeting, a flyer containing the pertinent information about the work was handed out, and it was also posted on-line. Communications staff asked all meeting participants to send the flyer to the employees in their respective agencies. Ferries staff posted hard-copy posters on the Bainbridge Island ferry, posted web ferry rider alerts and handed out postcards about the cloures to priority-medical ferry users. Communications staff sent out news releases and used social media channels to get the word out. TMC and field crews posted messages on both permanent variable-message-signs and portable changeable-message-signs a week in advance of the work. Communications staff also asked organizers of the Chilly Hilly bike ride to send the information to event participants in Kitsap County.

The information blitz did result in email and telephone inquiries that were answered by Communications staff. The one overwhelming comment was that the work should occur at night, and that daytime closures would subject SR 305 traffic to unbearable backups.

Start of hand cleaning photos

About 9 tons of dirt was removed

The troughs (dirt catchers) were cleaned

The bridge was flushed

Sidewalk edge repair

Sidewalk edge repair

Washout repair

New Clearance Signs

After flushing but before needle scale and paint

After needle scale and painting

Pedestrian Rail Repair/riser added for 42 inches

Work platform rail repair

Pack rust on hanger

Rivet heads rusted down to points

Four sidewalk joints were repaired

The south approach was repaved

Sealing the deck panel joints

The deck was patched

Lower rivets showing section loss

Rivets replaced with high strength bolts

EXECUTION

The work began on the morning of February 9, 2015. Traffic volumes started off light and remained so throughout the day, with at most, 15-minute delays seen. This traffic pattern prevailed through the first part of the week. By Thursday, traffic volumes were building and on Friday, volumes got heavy enough that the bridge maintenance crew decided to stop work early. This same pattern continued through the sunny and relatively warm weekend.

The next week was very similar to the first week, with traffic building in the afternoons starting on Friday. Traffic counts taken shortly before and after the lane closures began showed about a 15% traffic reduction. Ferries reported about a 5% reduction on the Bainbridge Ferry and a 5% increase in both the Bremerton and Kingston ferries.

The crew was able to complete the hand-cleaning and flushing within two weeks. They removed approximately nine tons of material during that time. In addition to the hand-cleaning, they installed vertical clearance signs, patched sidewalks, repaired railing bent by a previous traffic accident, raised the pedestrian rail to new L&I standards, paved the bridge approach, repaired a work platform railing and scaled and painted rust in critical areas of the bridge. During the final week, State Bridge Inspectors performed their annual fracture critical inspection of the bridge.

Under all the dirt crews did find some decayed rivets, and more rust. Rust has developed between steel plates that will need to be addressed. The bridge needs a thorough removal of the existing paint and a new fresh paint job, which will be scheduled some time in the future. In the meantime the bridge maintenance crew will address all the priority repairs on the bridge.

ACCOMPLISHMENTS

- The bridge was hand-cleaned (nine tons of dirt were removed), flushed, needle scaled, and received touch up paint in critical areas.
- The state bridge inspectors were able to do a fracture critical inspection of the bridge.
- The approach roadway was patched.
- New vertical clearance signs were put up.
- The bridge deck was patched.
- The panel joints were sealed to prevent water from leaking onto substructure elements.
- Sidewalk joints were repaired.
- The pedestrian rail was raised to 42 inches.
- A rusted safety rail was repaired.
- About 45 failed rivets were replaced with high-strength bolts.
- Railing that was damaged by a previous traffic accident was repaired.
- A washout at the south abutment was fixed.
- Sidewalk spalls were patched.

KUDOS

"Our bad: Hats off to WSDOT | IN OUR OPINION *Bainbridge Island Review February 28, 2015 9:35 AM*

We were wrong.

We were gloriously wrong, we can now admit, to think that the closure of the Agate Pass Bridge down to one lane for much of the month of February would cause massive daily traffic jams and a commuting nightmare for Bainbridge drivers.

Washington State Department of Transportation closed the bridge down, as planned, but the shutdown so the bridge could undergo a deep cleaning has gone swimmingly well on Bainbridge's side.

"Trafficgedon" turned out to be the disaster that never was.

We expected much worse, of course, as readers who recall our hand-wringing editorial published before the shutdown can attest.

We were worried that the closure was stretched out for too many hours during the day, and for too many days in total. WSDOT's warnings that people should just work from home and avoid the bridge during daylight hours truly left us a bit worried.
While we're not completely over that last bit (about the length of the shutdown), daily disruptions on the Bainbridge side have been minimal.

It typically takes a little more than 6 minutes to travel from High School Road to Manual Road along Highway 305 during times of normal traffic flow.

The Review has been timing our travels up and down Highway 305 since the shutdown, and our stopwatch exercise has shown there have only been two times so far where that

commute has stretched longer than 8 minutes.

Twice, during the 9 a.m. weekday southbound rush, the trip has taken 10 to 11 minutes. And while that's nearly double the usual time the trip takes, it doesn't rise to the level of inconvenience.

True, travelers from Poulsbo to Bainbridge have faced long delays — 30 minutes or more — trying to make it to the Agate Pass Bridge.

But for Bainbridge, the delays have been nothing to complain about. A tip of the hat to WSDOT planners and those directing traffic at the Suquamish Way intersection for keeping the traffic clogs off the island."

FROM BECKY ERICKSON MAYOR OF POULSBO

"Please express my thanks to all involved. This process was a whole lot less painful than I had anticipated. Kudos!! Kevin….a big thank you to everyone……please let your team know that their efficiency and work efforts are deeply appreciated.

Becky

FROM ANNE BLAIR, MAYOR OF BAINBRIDGE ISLAND

"We're all very pleased that the Agate Pass Bridge work is completed for this year. Even moreso because the preliminary inspection seems to show that our functionally obsolete bridge is functionally safe! Thanks for keeping us all well informed about the project. I especially appreciated the early finish date, to say nothing of the fascinating pictures showing what the now-clean structure looks like from a bridge-worker's perspective."

FROM TOM BROBST, PUGET SOUND ENERGY

"Congrats on a job well done to your team. I only had to go to BI one time during the process. I was able to get through before the flagging in the morning but not mid-day. The delay getting off the island was not too bad for a one time occurrence. Glad to hear the bridge is in good shape. Thanks for your updates during the project."

Tom

Updated Guide Supports Collaboration Between Local Agencies and Schools to Improve Traffic Safety for Students

By Ed Spilker, WSDOT Bicycle Pedestrian Coordinator

The safety, health, and well being of children are major concerns and responsibilities of all communities. Parents, school districts, local health departments, community organizations, and city and county officials including planners, public works, and law enforcement all play a role in nurturing a new generation of safe and healthy children. To help support this, the Washington State Department of Transportation, in partnership with the Washington Traffic Safety Commission, Washington State Department of Health, and the Office of Superintendent of Public Instruction have published an update to School Walk and Bike Routes: A Guide for Planning and Improving Walk and Bike to School Options for Students.

This guide provides resources to help develop, maintain, and improve school walk routes and address bicycle and pedestrian safety near schools. It provides guidance and technical resources for schools and their communities to move toward more supportive environments for school children and their families to walk and bicycle. The guide speaks to the many ways that community members can work together to use walking and bicycling to school as a means to achieve that goal. It addresses education programs that teach safety, and encouragement programs that help students and families develop new walking and biking habits for a lifetime. Enforcement and engineering safety improvements near schools are included to help communities minimize risk to students as they travel to school. The updated guide can be found on the WSDOT website. For more information please contact Ed Spilker, WSDOT Active Transportation Programs Specialist at 360-705-7387 or Ed.Spilker@wsdot.wa.gov.

Shedding Light on I-90 Over Snoqualmie Pass

By Meagan Lott, WSDOT Southwest Region Communications Consultant

Drivers heading over Snoqualmie Pass are saying Interstate 90 looks more like an airport runway lined with lights than a mountain pass.

The Washington State Department of Transportation installed more than 4,600 solar-powered LEDs (light-emitting diodes) to illuminate shoulders, lane lines and barriers as part of a pilot project to improve visibility.

Snoqualmie Pass receives more than 400 inches of snow fall each winter. Lane stripes fade from deicer, snow removal, studded tires and chains. Keeping lane stripes visible is a big challenge for maintenance crews on the pass.

With the help of a federal grant through the Highways for LIFE Program, WSDOT will spend the next three years monitoring the durability and longevity of the LEDs.

The LEDs are recessed into the pavement and protected by hard plastic shells. Crews installed the LEDs last fall along a 5-mile section near the summit of Snoqualmie Pass in both the eastbound and westbound lanes.

This project is the first of its kind in the state and WSDOT is hopeful the new kind of lane markings will improve visibility despite dark, seasonal conditions. If successful, the LEDs may be considered for other locations along the I-90 corridor.

WSDOT photo: Snoqualmie LEDs – New solar-powered LEDs on Snoqualmie Pass improve visibility for drivers.

WSDOT photo: Snoqualmie LEDs – WSDOT installed more than 4,600 solar-powered LEDs on Snoqualmie Pass last fall.

Active Transportation Programs Section–New Name/New Website

By Charlotte Claybrooke, WSDOT Local Programs Active Transportation Programs Manager

The WSDOT Local Programs Community Design Assistance Section has become the Active Transportation Programs Section. The section will still administer the Pedestrian and Bicycle Program and the Safe Routes to School Program. It will serve to focus federal and state funding towards projects in areas of the state with the highest need and potential for success. The section goals are to:

- Reduce the number of bicyclists and pedestrians killed or seriously injured in traffic crashes to zero.
- Increase the percentage of trips made by bicycling and walking.
- Advance Washington's multimodal transportation system to support healthy communities and economies that align with local values.
- Increase the number of children walking and biking to school safely.

Work will focus on providing resources to local jurisdictions to help improve conditions for people walking and biking. Key to these efforts will be the dissemination of research based information about best practices for bicycle and pedestrian improvements. Active Transportation Programs staff are available to provide technical assistance including:

- Community assessment site visits to identify possible bicycle and pedestrian safety and mobility improvements
- Community presentations and/or facilitation of community engagement efforts
- Mapping network analysis
- Pedestrian and bicycle infrastructure best practice recommendations
- Bicycle and pedestrian user assessment (counts) data analysis
- Collision data review and analysis

For more information contact Charlotte Claybrooke Active Transportation Programs Manager, 360-705-7302, claybrc@wsdot.wa.gov or visit the Active Transportation Programs website.

Traffic Sign Retroreflectivity

By Dan Carruth, WSDOT Local Programs

WSDOT Local Technical Assistance Program (LTAP) would like to take this time to remind all agencies or officials having jurisdiction that on June 14, 2015 it will have been one year since the Federal Regulation for having an Assessment or Management Method in place and active to maintain the Sign Retroreflectivity for all Regulatory and Warning signs.

The Final Rule which included Revision 2 of the Manual on Uniform Traffic Control Devices (MUTCD) was published in the Federal Register on May 14, 2012, and took effect June 13, 2012. A new compliance date was given as two years after the effective date, or June 14, 2014 for agencies to have a maintenance method in place.

The Federal Highway Administration (FHWA) has published a great deal of material to assist agencies in complying with this regulation. Their website for Traffic Sign Retroreflectivity can assist you in gathering the information needed and find an assessment or management method that suits your agency's needs. One resource is the document "KNOW YOUR RETRO 2007" referred to as the "four-Pager" which was updated in 2013. This document has the requirements posted and lists the different assessment and management methods agencies can use to be in compliance with the Federal Regulation.

WSDOT Local Programs Traffic Services also has a "Traffic Sign Retroreflectivity" website with information on this subject that can help agencies along the process.


KNOW YOUR RETRO 2007+

Maintaining Traffic Sign Retroreflectivity

One of the listed methods is "Measured Reflectivity". The WSDOT LTAP Center has a Retroreflectometer that we loan to local agencies who wish to use the measurement method to review their sign inventory. Please contact Dan Carruth in our LTAP Center if you want to borrow the reflectometer.

FHWA has posted the research results for the minimum retroreflective levels for Blue and Brown sheeting. However, at this time, FHWA is recommending that agencies follow these levels as they monitor, install, and replace white-on-blue and white-on-brown signs.

Although not Required at this time, these levels are the current recommendation.

Memorandum

U.S. Department of Transportation
Federal Highway Administration

Subject: INFORMATION: Revised Recommended Minimum Maintained Retroreflectivity Levels for Blue and Brown Traffic Signs

Download Version
PDF [178 KB]

From: Michael S. Griffith - Director, Office of Safety Technologies

To: Safety Field, MUTCD Field, Federal Lands Highway Division Engineers

Date: April 5, 2012

In Reply Refer To: HSST

This memorandum supersedes the memorandum dated February 24, 2009 and revises the recommended minimum maintained retrorenectivity levels for white-on-blue signs and white-on-brown signs.

Section 2A.08 of the MUTCD, Maintaining Minimum Rctrorctlectivity of traffic signs allows the option for public agencies to exclude traffic signs with blue or brown backgrounds from the standard. The Federal Highway Administration (FHWA) completed research on recommended minimum retroreflectivity levels for these sign colors in 2008. That research report has recently been corrected after an error was discovered in the reported results for whi te legend on blue background and white legend on brown background rctroretlectivity levels. The amended published research results are shown in the table below:

Minimum maintained recommended retrorejlectivity levels

Sign Color	Sheeting Type (ASTM D4956-11a**)				Additional Criteria
	Beading Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VIII , IX, XI	
White on Blue	W*; B ≥ 3	W*; B ≥ 5	W*; B ≥ 12	W ≥ 250; B ≥ 12	Overhead
	W*; B ≥ 3	W ≥ 120; B ≥ 7			Ground-mounted
White on Brown	W*; Br ≥ 1	W*; Br ≥ 5	W*; Br ≥ 10	W ≥ 350; Br ≥ 10	Overhead
	W*; Br ≥ 1	W ≥ 150; Br ≥ 5			Ground-mounted

The minimum retroreflectivity levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2° and an entrance angle of -4.0°.
* This sheeting type should no1 be used for this color for th is applicmion.
** The current version of the specification ASTM D4956-lla combined Types VII, VIII and X as Type VIII.

The complete research report, with errata is avai lable on the Internet at: http://www.fhwa.dot.gov/publications/research/safety/08029/. The FHWA may consider a future rulemaking to amend the MUTCD to include white-on-blue signs and white-on-brown signs. This research will be taken into account if future rulemaking is proposed. However, at this time, the recommended values are not required by regulations. It remains the option of public agencies to consider these recommended minimum maintained retroreflectivity values as they monitor, install and replace white-on-blue signs and white-on-brown signs. If you have further questions, please contact:

- Cathy Satterfield, Office of Highway Safety, (708) 283-3552; or
- Carl Andersen, TFHRC, (202) 493-3366

Title VI Statement to Public

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