

Closer look at the Safety Edge



Vertical edge on STH 55 before any milling took place, a drop of about two inches.

There are potential advantages to making the low-cost improvement on narrow local roads with gravel shoulders that degrade over time, exposing the pavement edge and a dangerous drop off for traffic.



The look of the new Safety Edge on STH 55 prior to placing the shoulder.

SAFETY BENEFITS of the Safety Edge paving technology are well documented. National studies report that constructing a gradually sloping pavement edge on a roadway helps reduce the risk of a crash when drivers drift off the road and lose control of their vehicles.

The Wisconsin Department of Transportation is collaborating with the Federal Highway Administration during the 2011 road construction season to take a closer look at the constructability and maintenance of safety edge solutions. Chief Roadway Standards Engineer Jerry Zogg of WisDOT is leading a team working on the Safety Edge initiative with Bill Bremer, Safety Engineer with FHWA's Wisconsin Division. They plan seven pilot road projects across the state this summer to test installation of the Safety Edge.

The technology is one of five the FHWA is promoting as part of its Every Day Counts program. See story page 10.

Testing a new edge

Rather than construct a vertical pavement edge, the Safety Edge is a 30-degree angle built by using a "shoe" that attaches to the paving screed on existing paving equipment. Research indicates 30 degrees is the best slope for allowing drivers to re-enter the road safely.

Zogg says that WisDOT recognizes the role the Safety Edge can play in making crashes less frequent and severe. He sees potential advantages to making the low-cost improvement on local roads that are narrow with gravel shoulders that degrade over time, exposing the pavement edge and a dangerous drop off for traffic.

Hoping to shed light on building and maintaining the alternative, the Safety Edge team is taking

their questions on the road. "Our primary interest on these pilot projects is to learn more about incorporating Safety Edge in the paving process and get a clearer picture of how it works on different project types," Zogg explains.

"We also want to judge the best way to finish shoulders to give them stability and minimize erosion." Information from FHWA on the Safety Edge suggest that when shoulder gravel erodes or is scattered by tire wear, an angled edge helps reduce the risk of an edge drop off until maintenance programs can catch up.

The Safety Edge team will monitor installation of the paving detail on projects planned in each region of the state. Six of them feature hot mix asphalt and one involves reconstruction of a concrete pavement. Zogg explains they want to test the new edge on thin overlays, thick overlays, full reconstruction and in minor resurfacing or preventive maintenance scenarios.

A list of the 2011 Safety Edge pilot projects in Wisconsin appears on the next page.

The Wisconsin Transportation Information Center (TIC) plans to coordinate a demonstration showcase event at one of the project sites during the summer to give local road officials, contractors and others a chance to see a Safety Edge installation in action.

Zogg says among other things, they want to evaluate the best method for achieving the final shape of the Safety Edge in the case of multiple lifts, or sequential



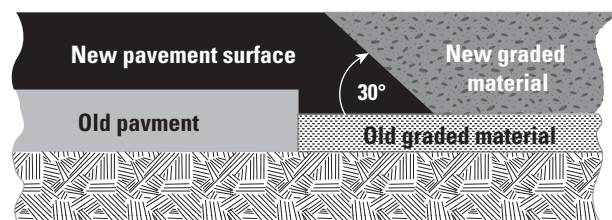
Trans Tech shoe attached to paving screed creates the Safety Edge.

layers of asphalt placed to get the intended depth. "We want to see if the new edge has an impact on pavement density or the smoothing surface of a hot mix road."

The Construction Materials Support Center at the University of Wisconsin-Madison is working with the Safety Edge team to develop a post-construction evaluation. They will survey engineers and contractors on the projects to document their recommendations on Safety Edge constructability.

The team also is identifying guidelines for the different project types. This includes developing specifications for HMA pavements and overlays, and concrete pavements and overlays.

They are providing information on equipment requirements to the Wisconsin Asphalt Paving Association (WAPA) to encourage contractors to acquire the neces-



Cutaway drawing shows how the sloped Safety Edge meets the graded shoulder material.

sary safety edge hardware. The TIC has a set of Trans Tech shoes that local agencies can borrow for use on their projects.

STH 55 experience

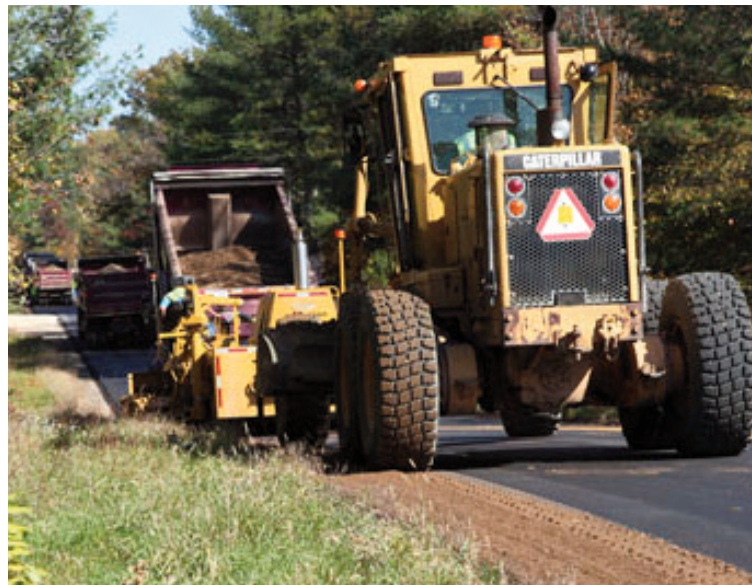
The WisDOT North Central Region successfully pilot-tested the first Safety Edge projects in Wisconsin in 2010 on STH 55 and STH 47 in Menominee County. FHWA selected the STH 55 project as one of a dozen national projects for an in-depth study of constructability issues. The contractor, Wisconsin-based Northeast Asphalt, tried two different Safety Edge maker technologies: a prototype end gate shoe by Carlson Paving Products and a shoe by Trans Tech that has been used on numerous projects in the United States in the past six or seven years. FHWA donated the Trans Tech shoes from the STH 55 to TIC so the Center can loan them to local governments.

At what cost?

Bremer says theoretical calculations done by the Texas Transportation Institute estimate installing the



Paver advances on the STH 55 project, producing the Safety Edge as it goes.



Crews place and grade the gravel shoulder on the STH 55 project, making it level with the new pavement surface and enclosing the Safety Edge.

2011 Safety Edge Pilot Projects in Wisconsin

HMA Projects

Northwest	US Hwy ST Hwy 13
Northeast	ST Hwy 42
North Central	ST Hwy 73
Southeast	ST Hwy 144
Southwest	ST Hwy 69

Concrete Project

Southwest	ST Hwy 23
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A 30-degree edge slope makes it easier for drivers who drift off the road to recover control.

Safety Edge may add between \$500 and \$2,000 per mile to a project. His experience with STH 55 and other on-the-road research suggests the amount of asphaltic material to construct the angled edge is almost negligible on a hot mix project, less than one percent in most cases.

The FHWA reports that the Safety Edge attachment should not affect the rate of production during laydown.

Option on local roads

Improving road safety by creating a durable pavement edge that reduces the danger of shoulder erosion, the Safety Edge is a paving option with application on local roads. TIC's demonstration showcase this summer will give public officials responsible for those roads a first-hand look at this technology. Watch *Crossroads* and the TIC website for more on the time and place for events. ■

The TIC has a set of Safety Edge shoes that local agencies can borrow for use on their projects.

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Resource

www.fhwa.dot.gov/everydaycounts/technology/safetyedge/
Safety Edge information on FHWA's Every Day Counts site features links to quick facts, case studies and other resources.