



I-TEAM BRIEF



The Innovation Team (I-Team) at the Caltrans Division of Research and Innovation, in cooperation with its partners, develops proven, ready-to-deploy innovations in methods, materials, and technologies that enable Caltrans to provide the most effective management of public services, resources, and infrastructure.

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DIVISION OF RESEARCH AND INNOVATION

Safety Edge

Reduce Pavement-Edge Drop-Off Hazards

Roadway departures account for 53% of fatal crashes. When a tire drops off a paved surface, a driver can have difficulty re-entering the roadway if the pavement edge is nearly vertical—especially if the height difference is significantly more than two inches. When the errant driver tries to steer back onto the roadway, the vertical edge can create a “tire scrubbing” condition that may result in over-steering, which in turn is likely to result in loss of control of the vehicle.

The Caltrans I-Team is working with the FHWA's Every Day Counts “Accelerated Technology and Innovation Deployment” initiative to help deploy the Safety Edge, a proven procedure to shape the edge of the pavement at 30 degrees from horizontal during the paving process.

READY TO DEPLOY

When compared with the conventional hot-mix asphalt paving process that results in a vertical edge, the Safety Edge improves pavement density at the edge and the shape eliminates the tire scrubbing that can result in collisions, overturned vehicles, or crashes. This wedge is typically built using a commercially available shoe that attaches to the screed near the end gate on the resurfacing equipment.

NEW AND IMPROVED

- Improves pavement density at the edge, creating a stronger interface between the pavement and the graded material
- Eliminates tire scrubbing
- Reduces tort liability
- Reduces maintenance expense
- Can be implemented with no significant added cost
- Shoe technology is commercially available, inexpensive, and reusable

An inexpensive way to ensure safer pavement edges is to specify a 30° angle, asphalt-filled “Safety Edge” on all road construction and resurfacing. The shoulder is completed with graded material level with the pavement surface.



Photo Source: FHWA

About Safety Edge

Safety Edge has been an effective safety innovation on California roadways for well over six years. Given its proven benefits and the FHWA's endorsement of the procedure as an Every Day Counts innovative technology targeted for accelerated deployment, Caltrans has made it a goal for 2010 to create a standard specification.



GET STARTED

Contact:

Rebecca Boyer, Caltrans DRI
rebecca_boyer@dot.ca.gov, 916.654.8367

Cathy Satterfield, FHWA
Cathy.Satterfield@dot.gov, 708.283.3552

Learn More

FHWA Web pages:

- http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/
- http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/fhwasa09023/

Safety Impacts of Pavement Edge Dropoffs:

- http://www.aaafoundation.org/pdf/PEDO_report.pdf

Construction of a Safe Pavement Edge: Minimizing the Effects of Shoulder Dropoff

- <http://www.transtechs.com/pdf/trbswm.pdf>

SUCCESSES

- One of five innovative technologies selected for the FHWA's Every Day Counts accelerated deployment initiative: FHWA will promote the installation of Safety Edge as standard practice on paving projects.
- Georgia Department of Transportation (GDOT), working with the FHWA, demonstrated the ability to construct the Safety Edge with no impact on production and at less than 1% additional material costs.
- Based on the successful performance after one year in service, GDOT has incorporated the "Safety Edge" design into all resurfacing projects since 2005.
- Part of Iowa DOT Design Manual:
<http://www.iowadot.gov/design/dmanual/03C-06.pdf>

METRICS

- Research has shown that virtually all drivers can recover, even at high speeds, if the edge shape is a 30-degree wedge, rather than vertical.
- The cost for incorporation of the Safety Edge has been calculated at less than 1% of additional asphaltic material.
- Researchers studying crashes in Iowa in 2002-2004 reported that pavement edges may have been a contributing factor in as many as 18% of rural run-off-road crashes, a type of crash that is four times more likely to include a fatality. In a similar Missouri study, the number was 25%.
- Tort liability claims resulting from pavement edge drop-offs cost highway agencies millions each year.

GET READY

- The Caltrans Office of Engineering and Specifications Development (OESD) has listed the development of plans and specifications for the Safety Edge as one of its seven key goals for Fiscal Year 2010-2011.
- FHWA recommends use of the TransTech Shoulder Wedge Maker, or the Advant-Edge, or a similar approved-equal device that produces the same wedge consolidation results.
- FHWA sample specs:
http://safety.fhwa.dot.gov/roadway_dept/pavement/safedge/sses/

The asphalt wedge provides a safer roadway edge, and a stronger interface between the pavement and the graded material.

