THE SAFETY EDGE
THE PURPOSE, NEED, AND PRACTICAL SOLUTION
Every Day Counts

Every Day Counts (EDC) is designed to identify and deploy innovation aimed at shortening project delivery, enhancing the safety of our roadways and improving environmental sustainability.
The Safety Edge

Purpose and Need
• Crash Types and Problem Locations
• Risk Factors in Edge Drop-off Crashes

A Practical Solution
• Construction of the Safety Edge
• Durability

Benefits and Costs

Conclusion
The Safety Edge: Purpose and Need
1 Fatality Every 13 minutes

111 people will die in a crash today in the United States.
2008 Fatal Crashes (Based on FARS)

17,818 U.S. Roadway Departure Crashes

34,017 U.S. Fatal Crashes

ROAD WAY DEPARTURE CRASHES 53%

RUN OFF ROAD LEFT 10%

RUN OFF ROAD RIGHT 24%

CROSSES 17%

NON ROADWAY DEPARTURES 47%

UNKNOWN ROADWAY DEPARTURES 2%
Approach to Reducing Roadway Departure Crashes

• Low-Cost Solutions
• Highly-Effective Countermeasures
• Systematic Application
Locations at High-Risk for Drop-offs

- Horizontal Curves
- Near Roadside Mailboxes
- Turnarounds/Unpaved Pull-Outs
- Shaded Areas
- Eroded Areas
- Asphalt Pavement Overlays
Horizontal Curves
Mail Boxes
Turnarounds/Unpaved Pull-Outs
Shaded Areas

Sunlight = Vegetation
Eroded Areas
Asphalt Overlay

2” Asphalt Overlay + Existing 5” Drop-off = Extreme Unsafe Condition
Are Drop-offs a Problem?
Edge Drop-off Crash Types

- Roll Over
- Head-on
- Opposing Sideswipe
- Roadside Object
Typical Drop-off Crash with Tire Scrubbing

http://fhwa.na3.acrobat.com/seproblem/
Without a Safety Edge
Driver crosses over into oncoming traffic

Driver Overcompensates Steering

Right tires leave edge of pavement
With Safety Edge
Risk Factors

What are the factors associated with pavement edge drop-off crashes?

- Speed
- Driver Experience
- Vehicle/Tires
- Drop-off Height
- Shape Of Pavement Edge
Drop-Off Danger Demonstration
Reasonably Safe

Unsafe

Questionable Safety

Marginally Safe

Reasonably Safe

Safe

Optimum Edge Designs

Longitudinal Edge Elevation Change (inches)

Relative Degree of Safety

Graphic Source: Zimmer and Ivey, Texas Transportation Institute
The Safety Edge: The Practical Solution
Construction

Similar to Conventional Paving
(No Effect on Production)

- Clip Shoulders
- Construct Overlay
- Pull Shoulders Flush
The Hardware

Trans Tech Shoulder Wedge Maker™
www.transtechsys.com
www.troxlerlabs.com

Advant-Edge™
www.advantedgepaving.com
Angle Measurement

Line Depicts extension of Pavement Surface

Line depicts a plane parallel to Pavement Surface from the toe of the wedge surface

30° - 35°
Rolling Process
Finished Surface
Finished Surface

- Breakpoint on wedge
- Existing pavement edge
- Toe of wedge
- New graded shoulder
Finished Surface
Lift thickness does not correlate with edge depth.

The lift of asphalt is 1.5 inches as can be seen at the centerline.

Across the road it shows about a 4 inch depth because the shoulder was lower after clipping the shoulder.
Drop-Off with the Safety Edge
Increased Edge Durability?

Without Safety Edge | With Safety Edge
Comparison of Edges

Paving with the Safety Edge

Paving without the Safety Edge shoe
Edge Durability
Edge Compaction

Condition After 6 Years of Service

Without Safety Edge

With Safety Edge
Durability

http://fhwa.na3.acrobat.com/setruck/
Tracy’s Law

“If you lose the edge, you lose the road.”

Tracy Cumby
TxDOT Project Director

Photos Courtesy of Dr. William Lawson
Texas Tech University
Benefits of the Safety Edge

• Temporary safety benefit during construction
• Increase production—shoulder work work after overlay complete
• Providing “Due Care”
• Aid vehicle re-entry

• **Increased Pavement Edge Durability**
• **Reduced Crashes Over Life of the Pavement**
Costs of the Safety Edge

• Hardware
  – Approximately $3000 per shoe
  – Reusable

• Material
  – Minor additional asphalt (depends on shoulder condition)

• Paving Process
  – No change in paving speed
  – No additional operation
  – Minimal monitoring

• Surface Details
  – No change in smoothness/ride quality
Every Safety Edge Counts

The Safety Edge provides benefits to all stakeholders: owners, contractors and the driving public.

The Safety Edge saves lives and improves pavement edge durability.

The Safety Edge costs less than 1% of pavement resurfacing budgets.

You can help reduce pavement edge drop-off crashes!
Safety Edge Grant

The Safety Edge Shoe Device is available through a FHWA grant program. For more information about the grant and how to apply, please visit the Arizona Local Technical Assistance Program’s (AZ-LTAP) website:

http://www.azltap.org/
Every Day Counts
Innovation Initiative

Contact Information
For training or more information on this Every Day Counts Initiative, please contact your local FHWA Division Office or Arizona LTAP.

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To learn more about EDC, visit:
http://www.fhwa.dot.gov/everydaycounts