



U.S. Department
of Transportation
Federal Highway
Administration

SafetyEDGE
Your Angle for Reducing Roadway Departure Crashes



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

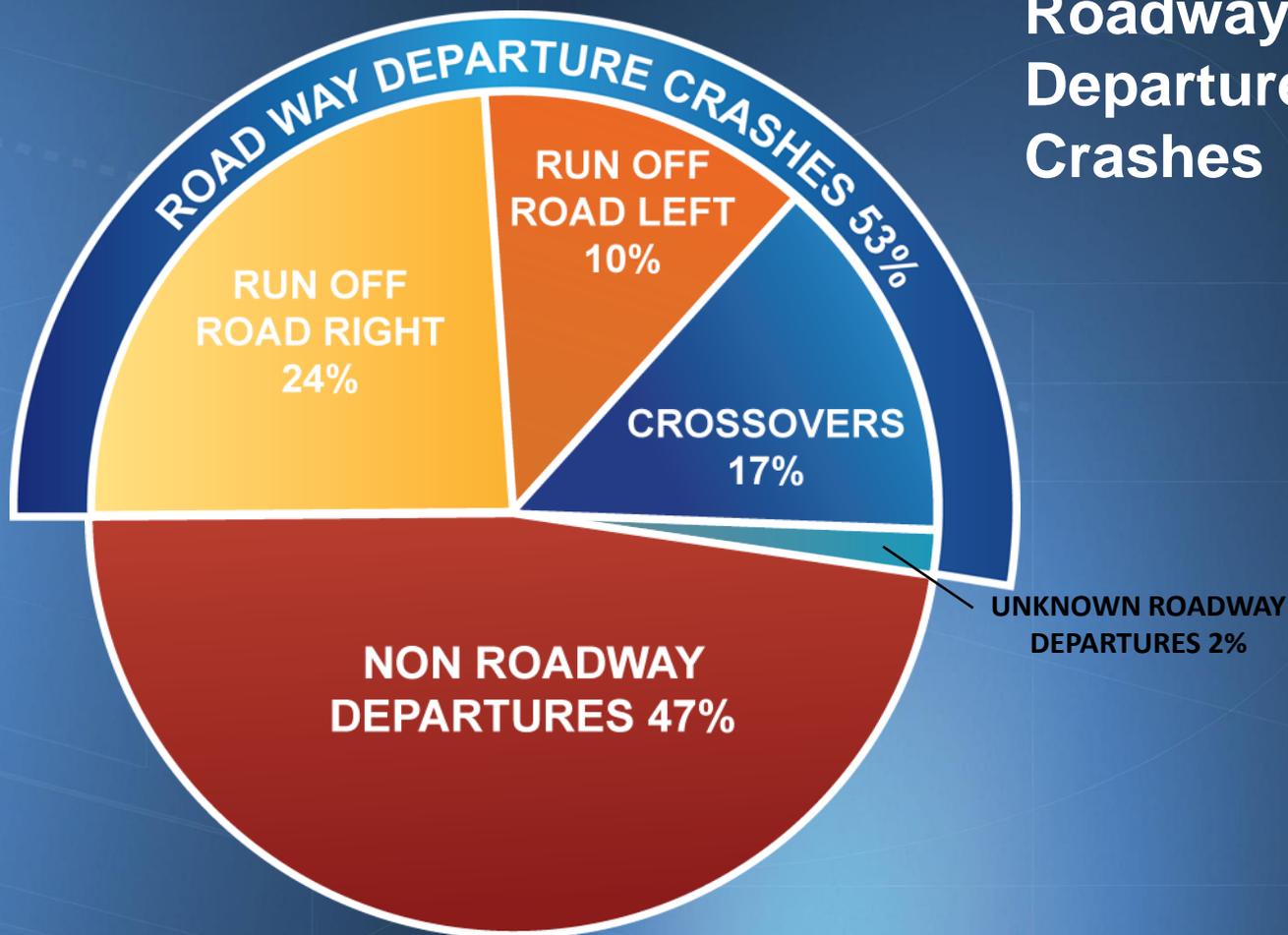
111 people will
die in a crash
today in the
United States.





2008 Fatal Crashes (Based on FARS)

**17,818 U.S.
Roadway
Departure
Crashes**



**34,017
U.S. Fatal
Crashes**



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

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Mail Boxes

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Turnarounds/Unpaved Pull-Outs





Shaded Areas

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Eroded Areas

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Asphalt Overlay

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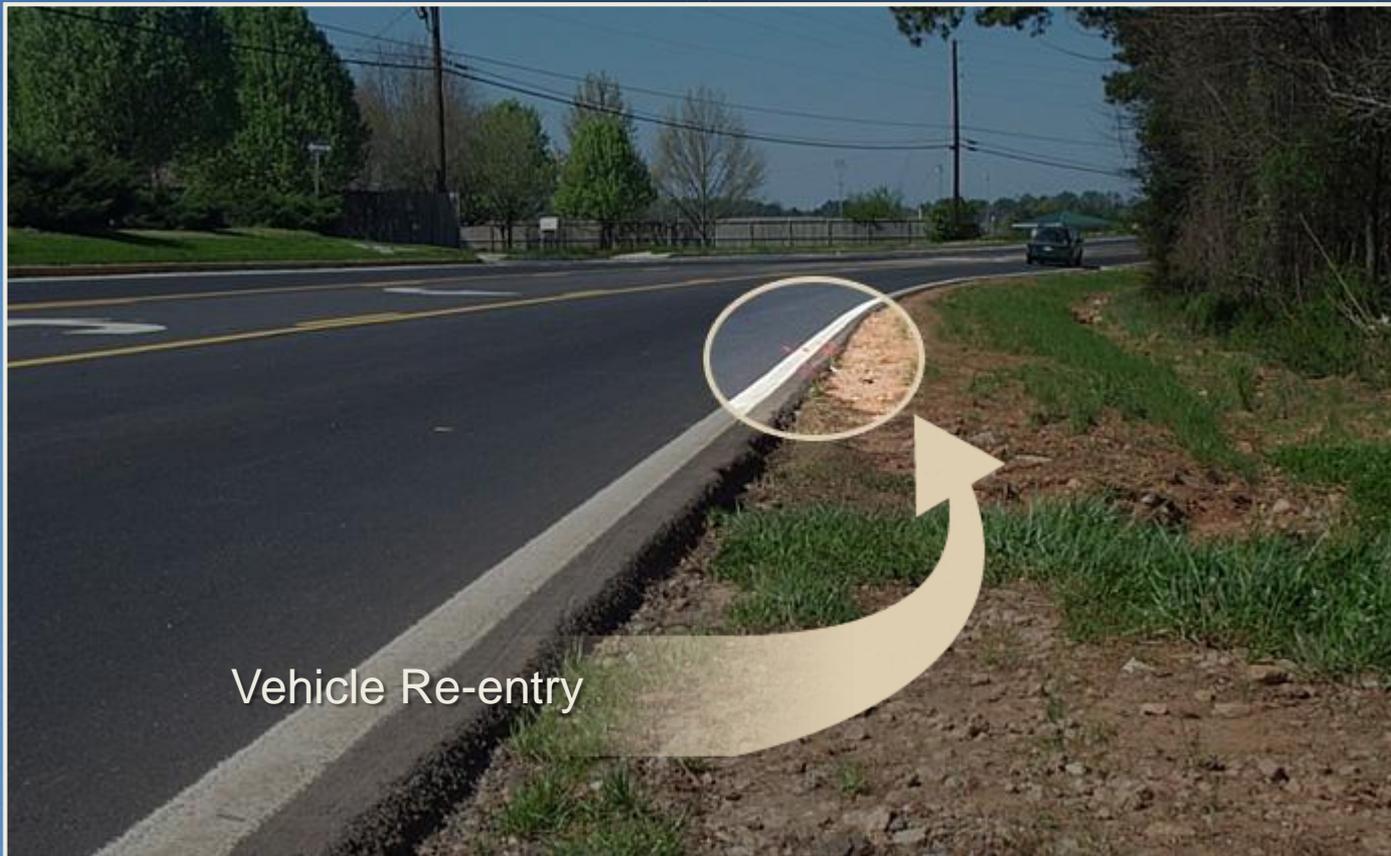
2" Asphalt Overlay

+ Existing 5" Drop-off

= Extreme Unsafe Condition



Are Drop-offs a Problem?

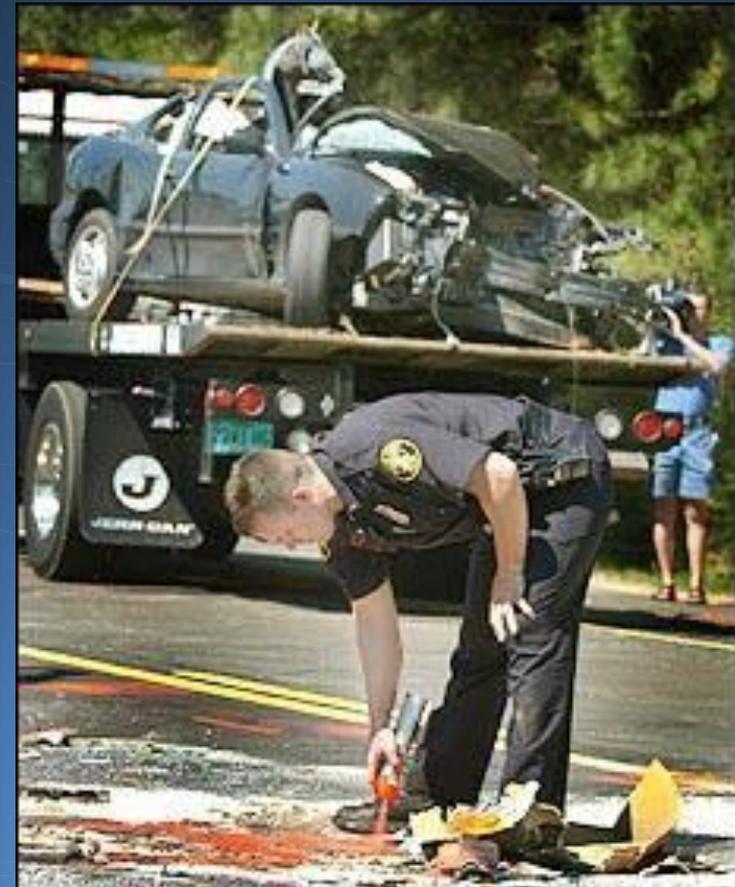


Vehicle Re-entry



Edge Drop-off Crash Types

- Roll Over
- Head-on
- Opposing Sideswipe
- Roadside Object



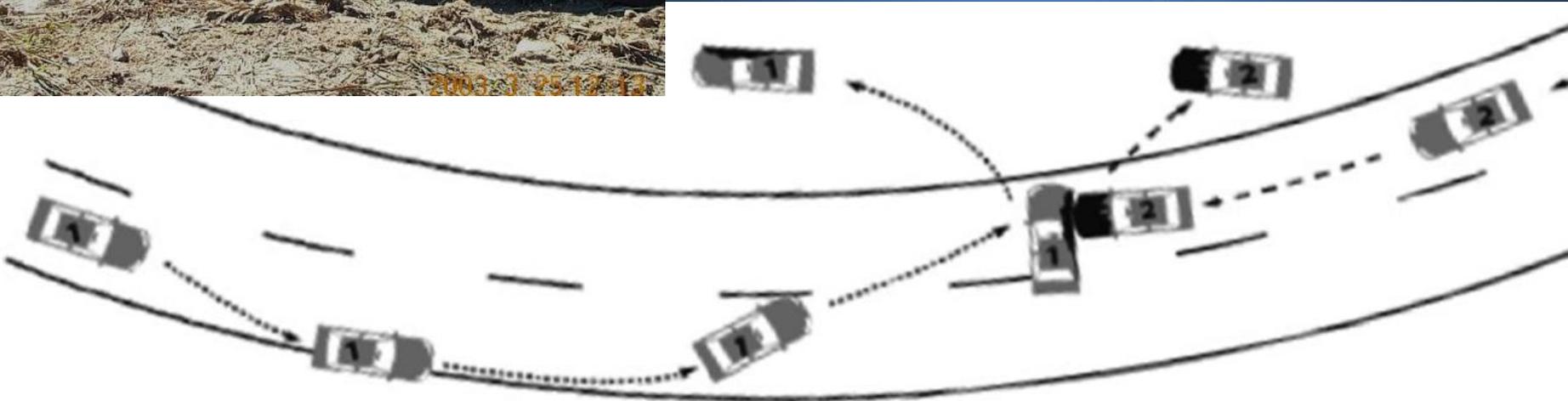
From The Atlanta Journal Constitution, 3-25-03



Typical Drop-off Crash with Tire Scrubbing



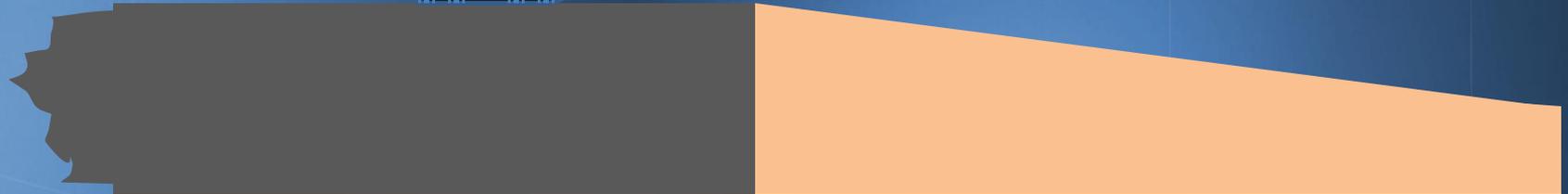
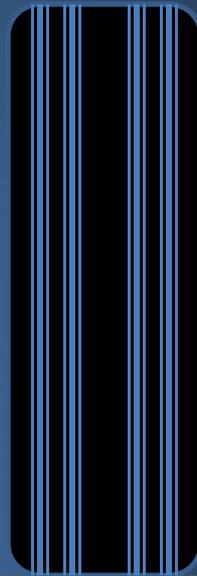
<http://fhwa.na3.acrobat.com/seproblem/>

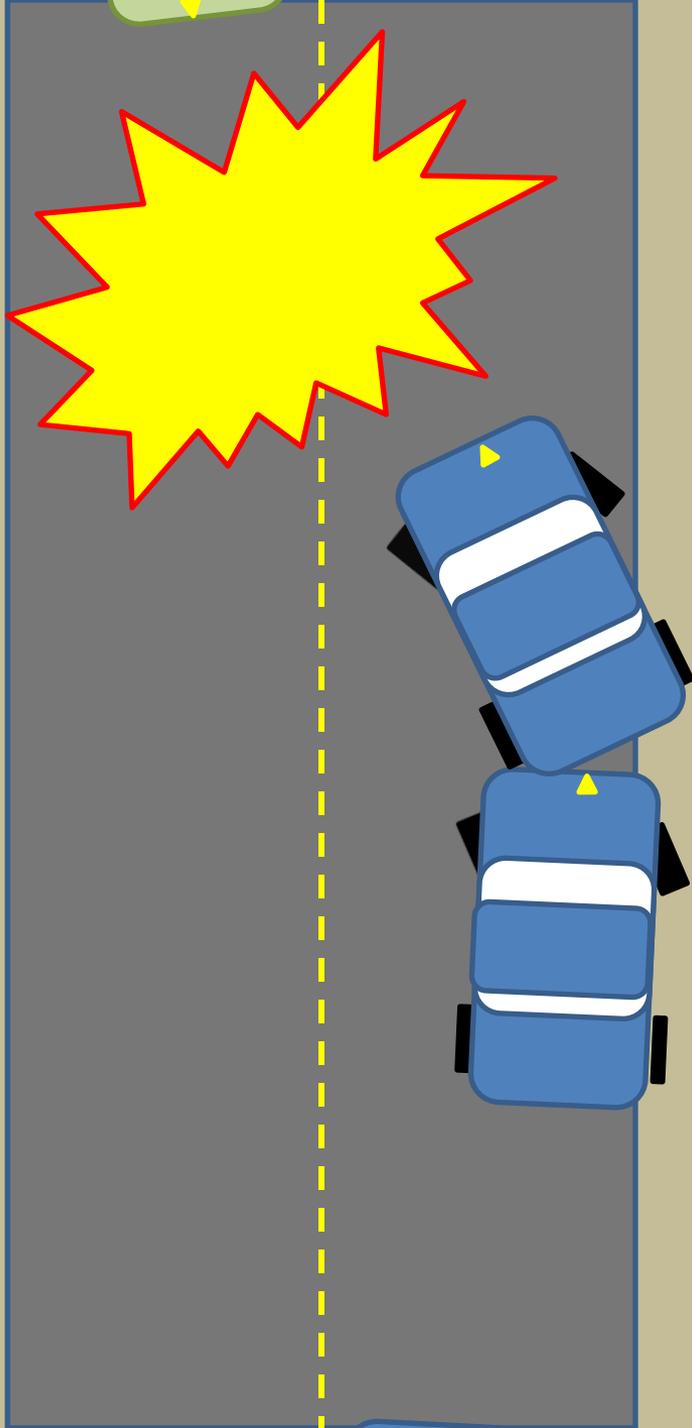




Without a Safety Edge

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Driver crosses
over into
oncoming traffic

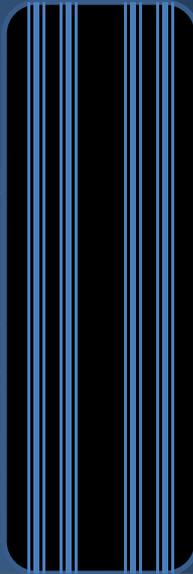
Driver
Overcompensates
Steering

Right tires leave
edge of
pavement



With Safety Edge

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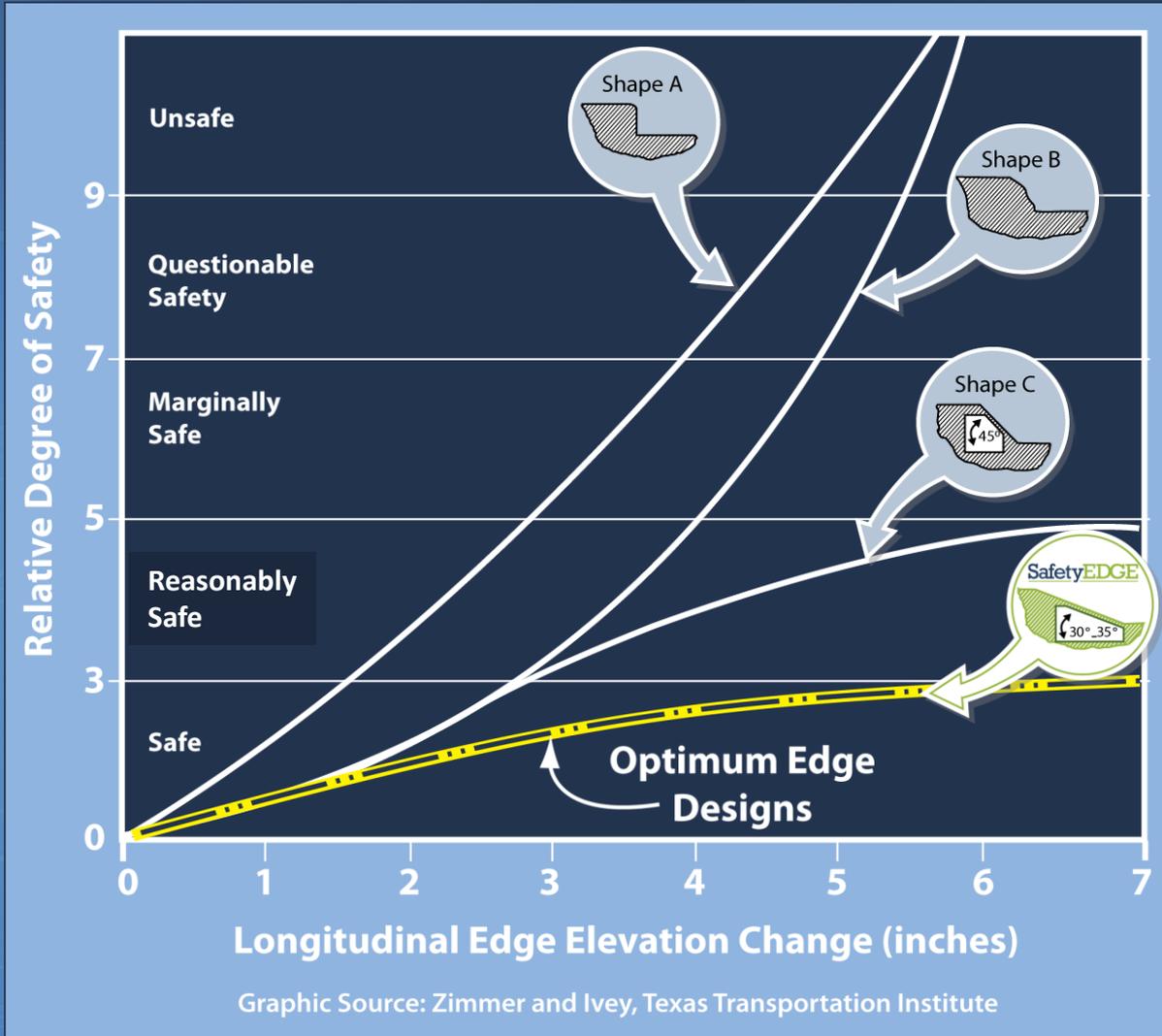
Risk Factors

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





The Safety Edge: The Practical Solution

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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

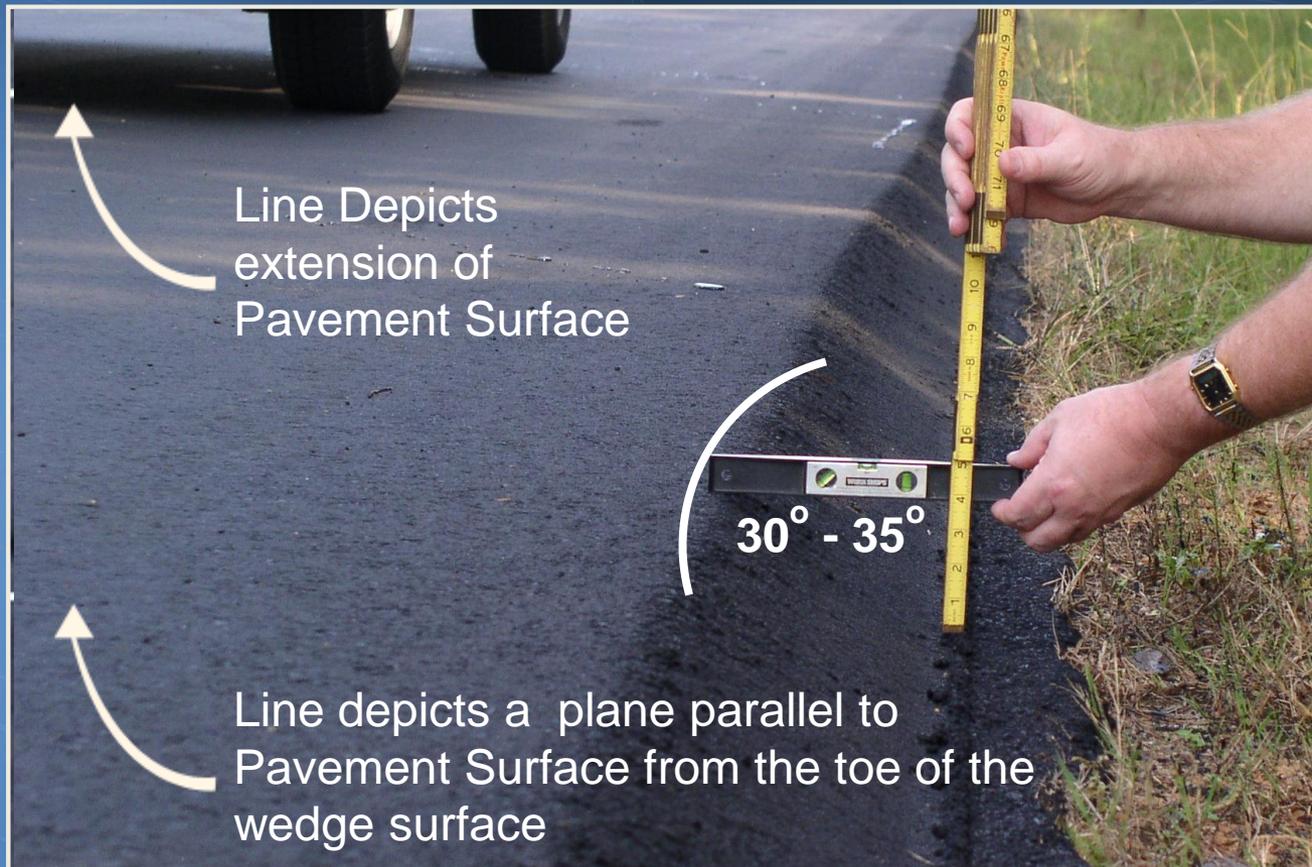


Advant-Edge™

www.advantedgepaving.com



Angle Measurement



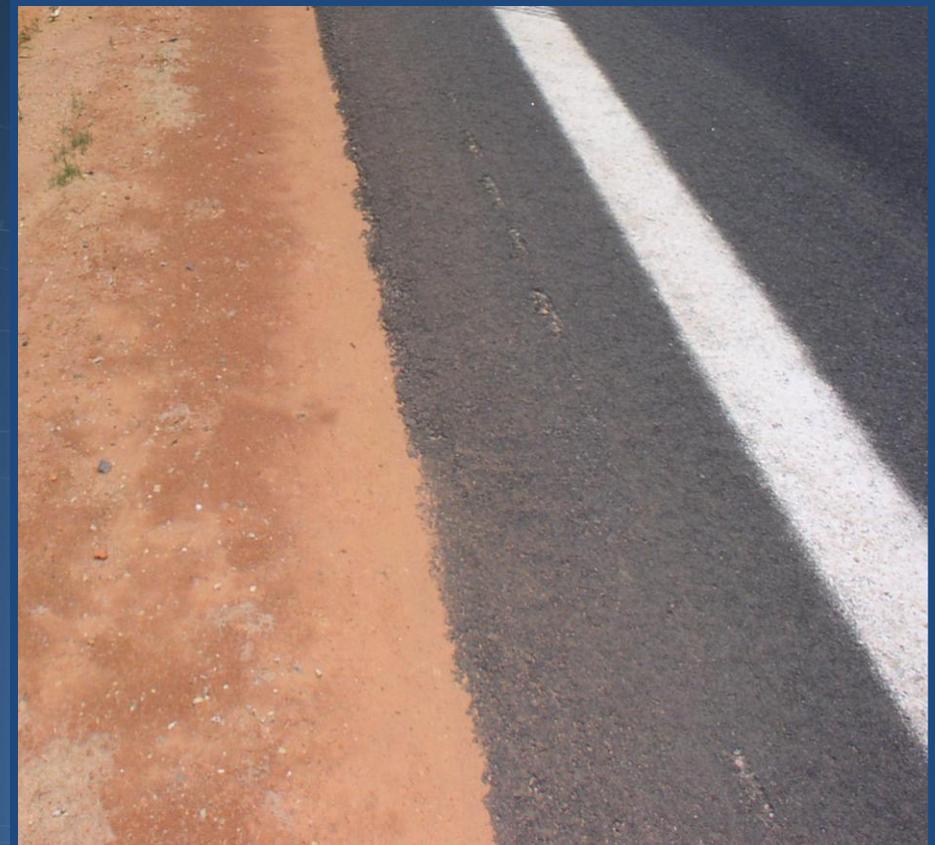


Rolling Process



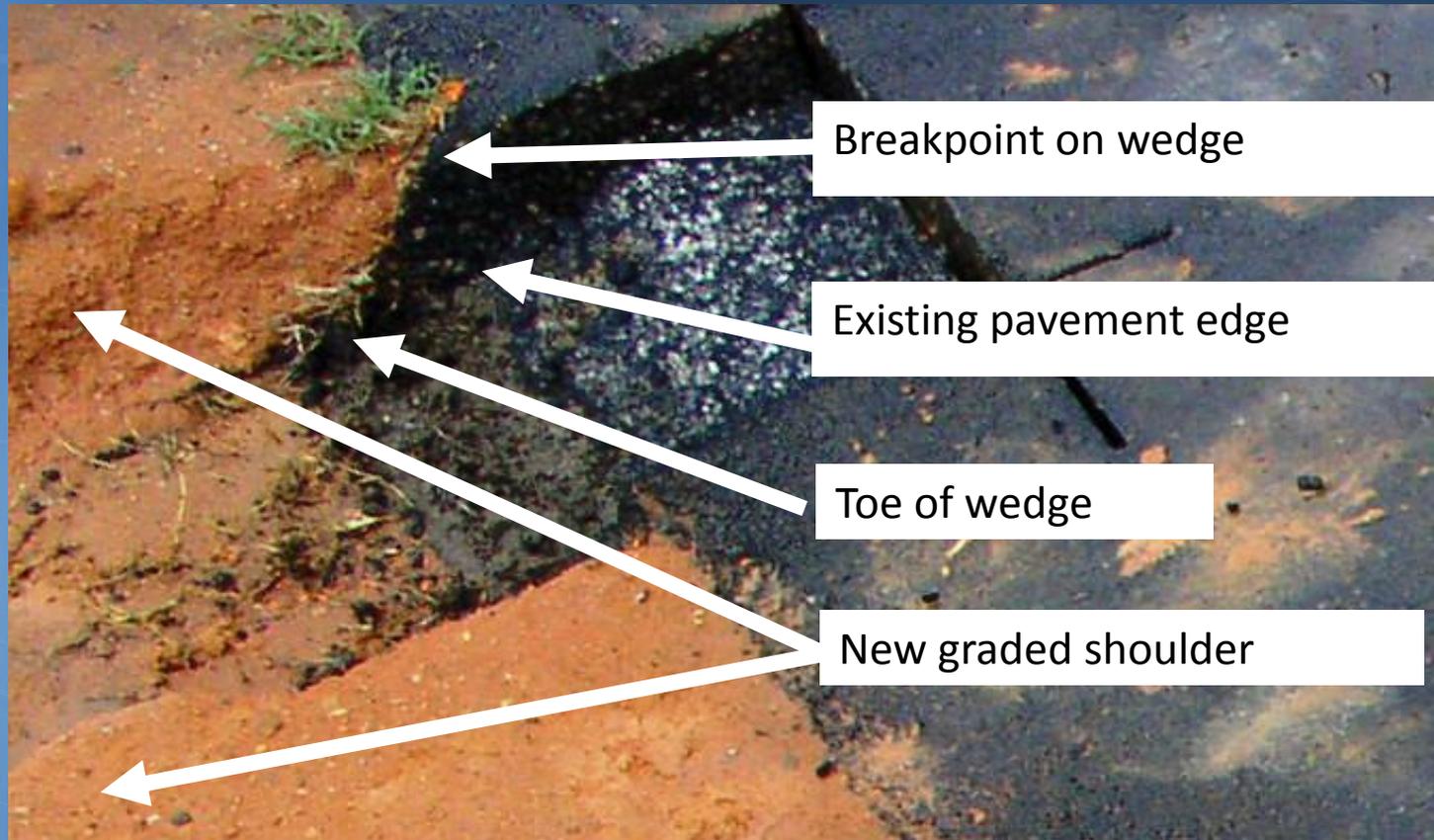


Finished Surface





Finished Surface





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



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Comparison of Edges

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Paving with
the Safety
Edge

Paving without
the Safety Edge
shoe



Edge Durability

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Edge Compaction

Condition After **6** Years of Service



Without Safety Edge

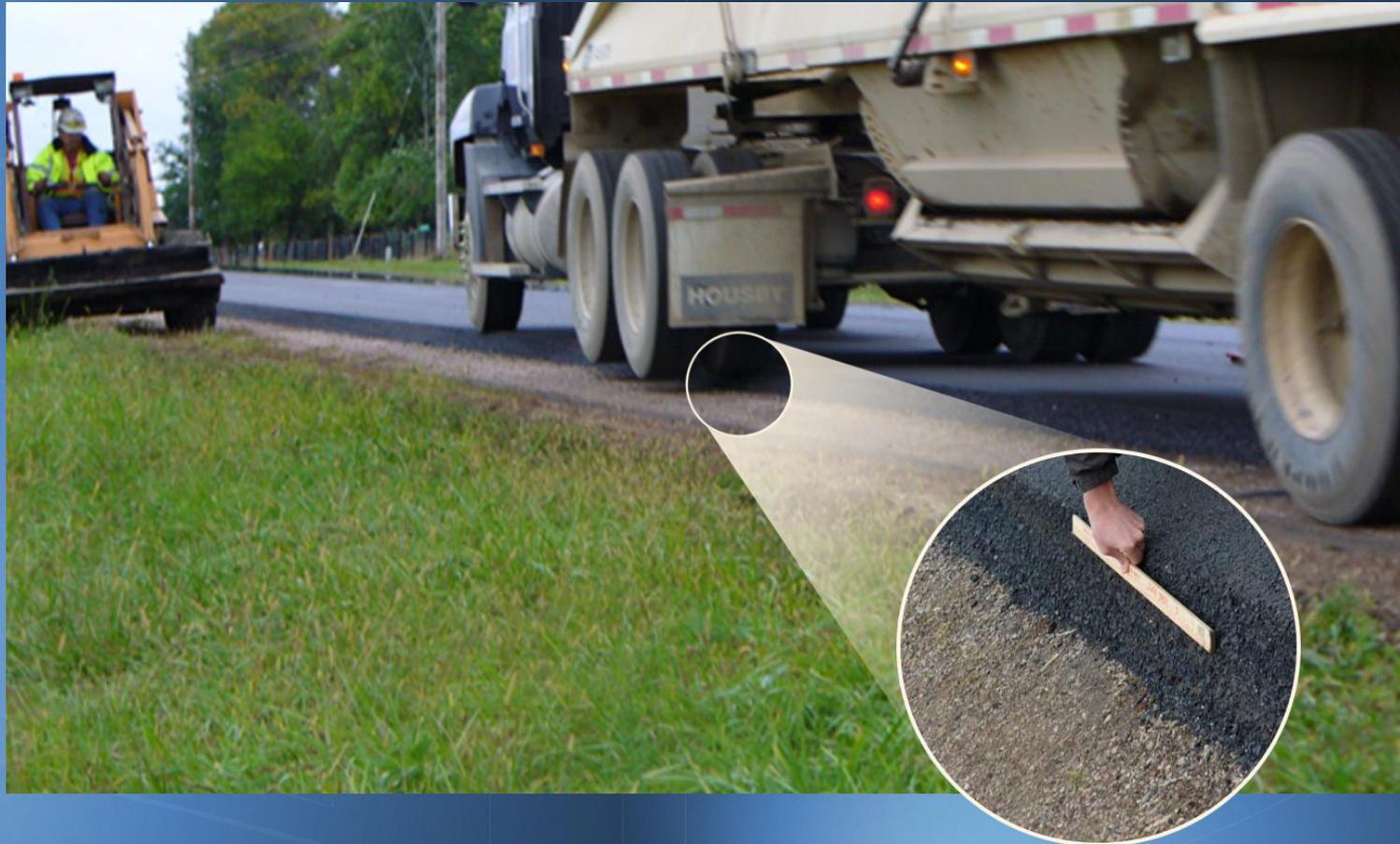


With Safety Edge



Durability

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<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 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>