



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

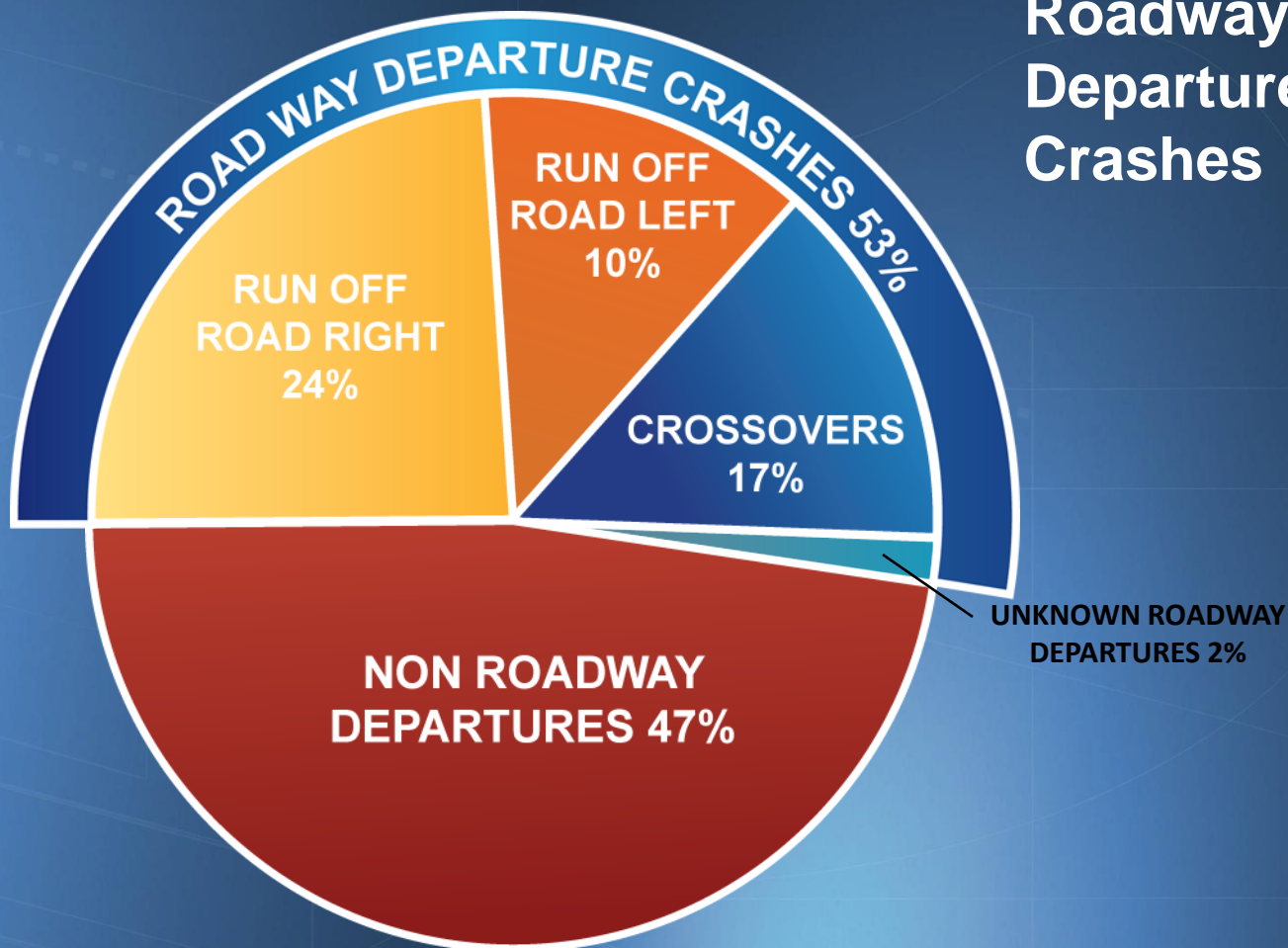
111 people will  
die in a crash  
today in the  
United States.





# 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**

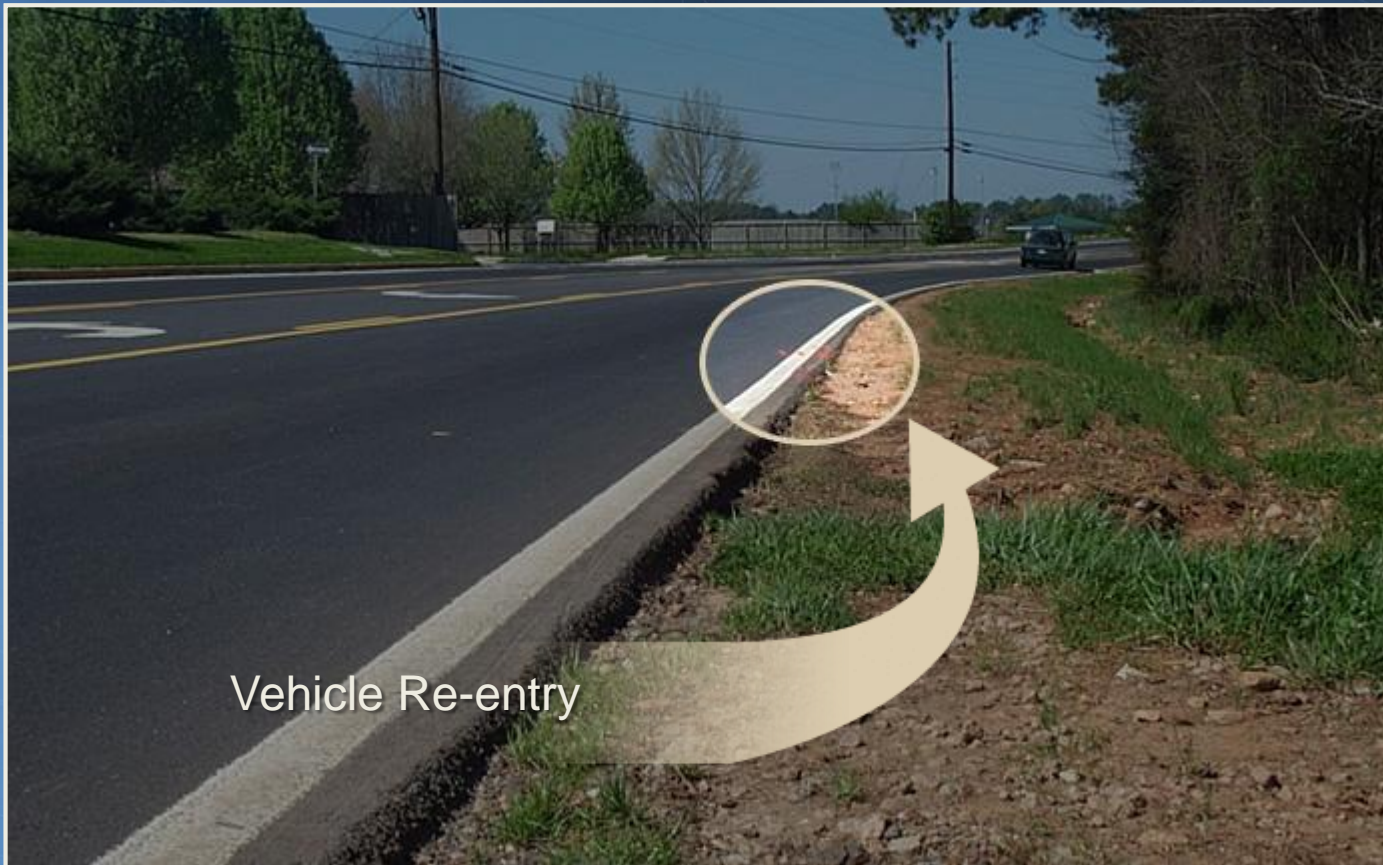
**+ Existing 5" Drop-off**

**= 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

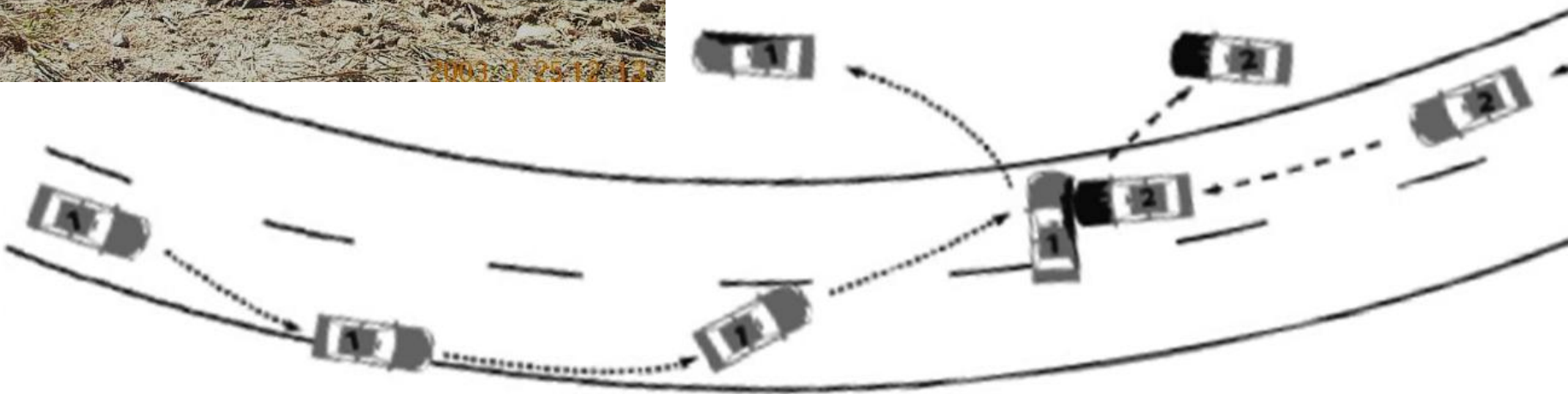




# Typical Drop-off Crash with Tire Scrubbing



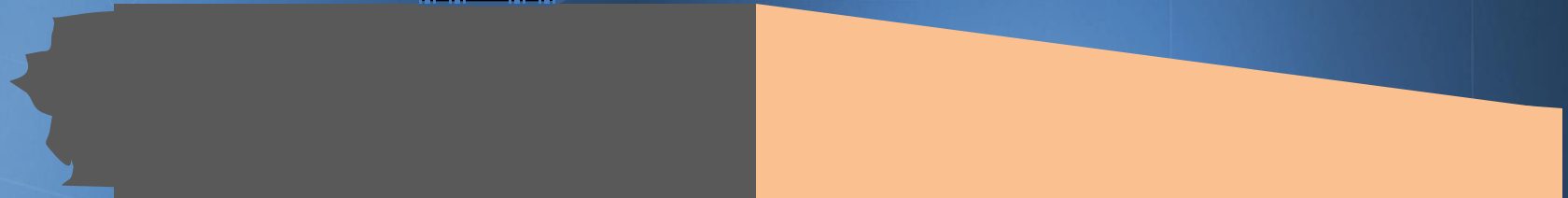
<http://fhwa.na3.acrobat.com/seproblem/>

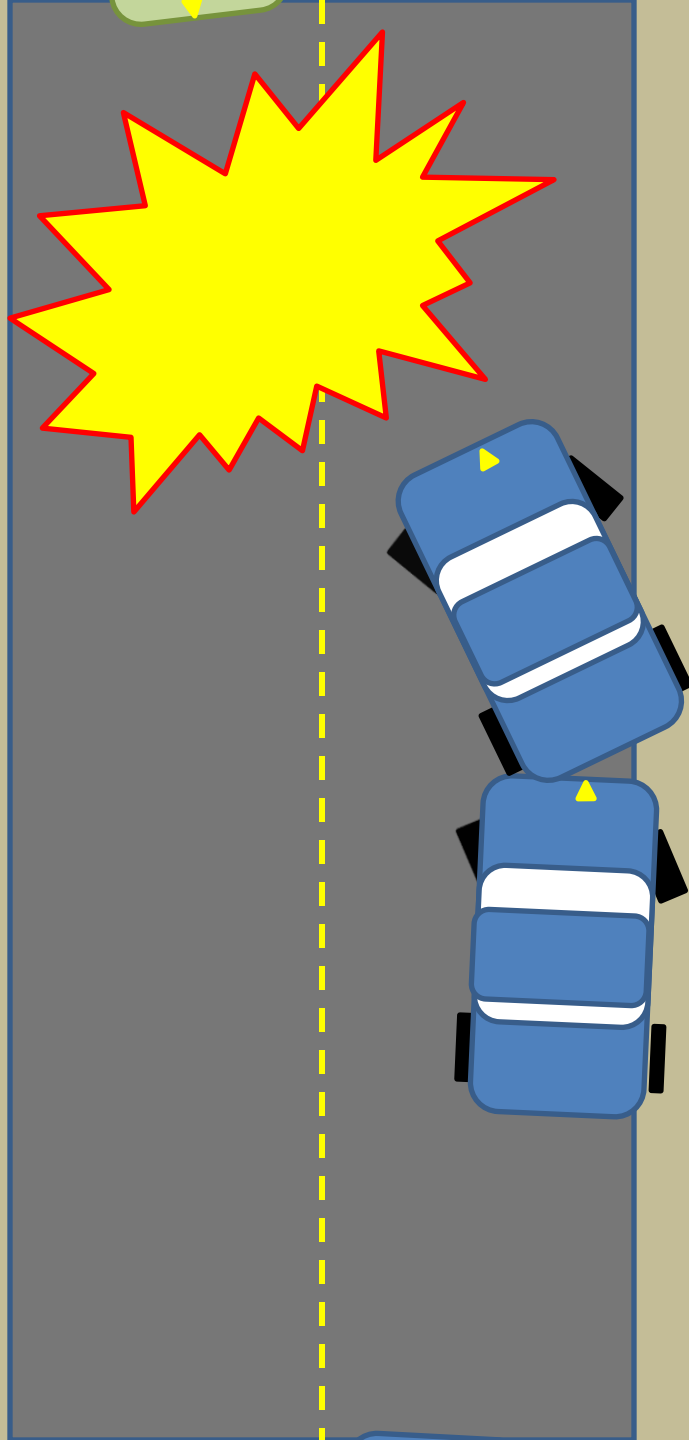




# Without a Safety Edge

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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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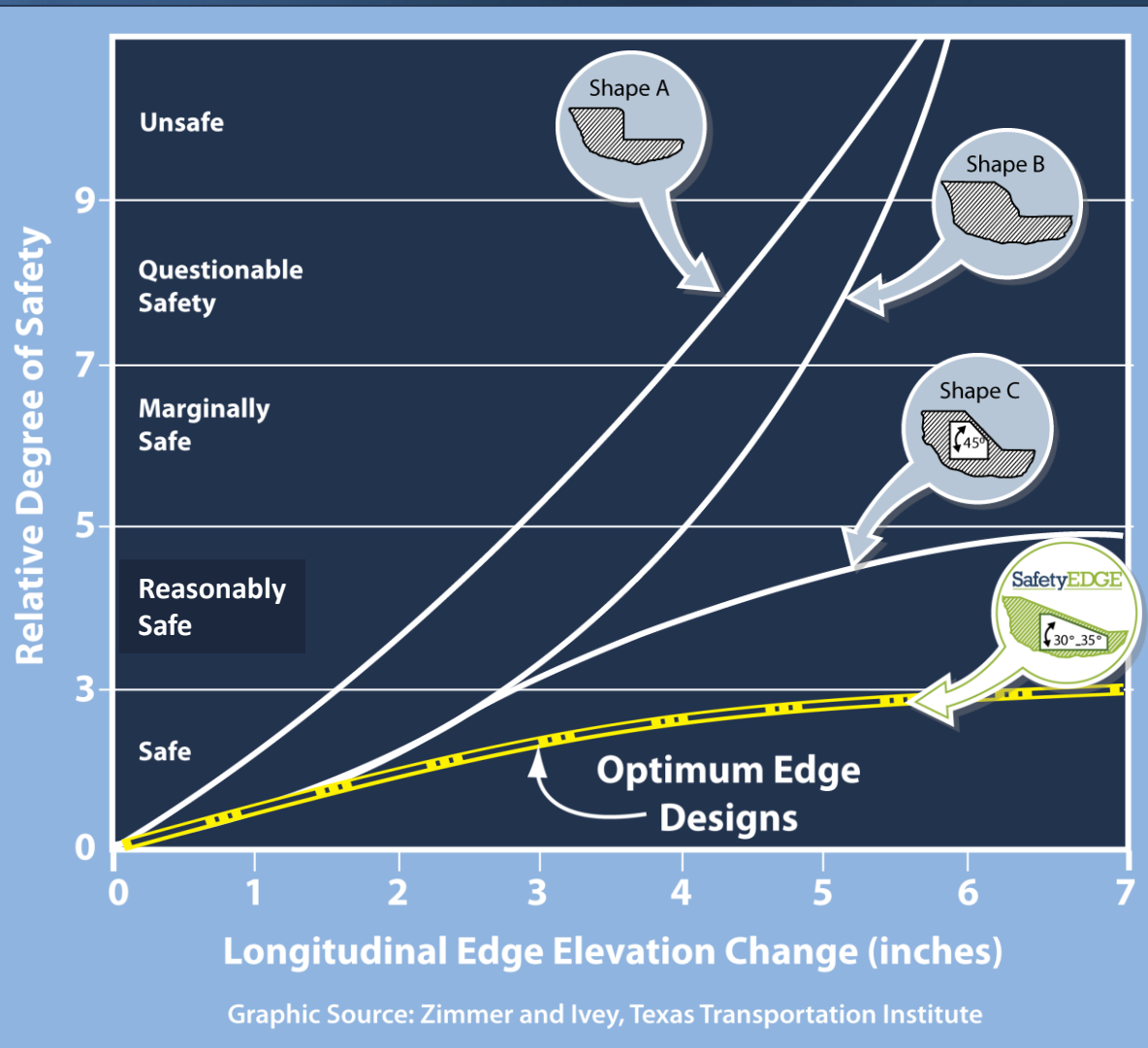
# Risk Factors

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](http://www.transtechsys.com)

[www.troxlerlabs.com](http://www.troxlerlabs.com)



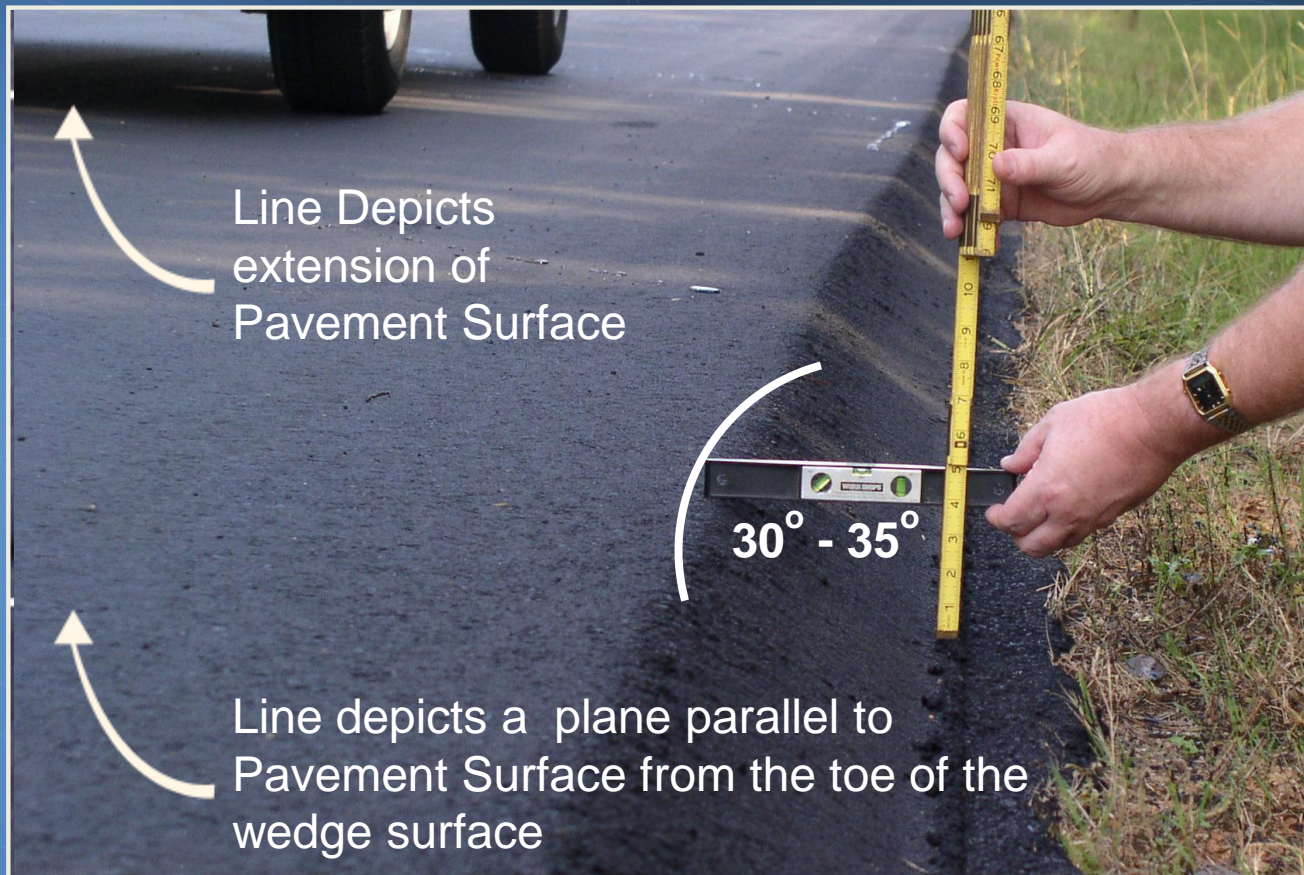
**Advant-Edge™**

[www.advantedgepaving.com](http://www.advantedgepaving.com)





# Angle Measurement





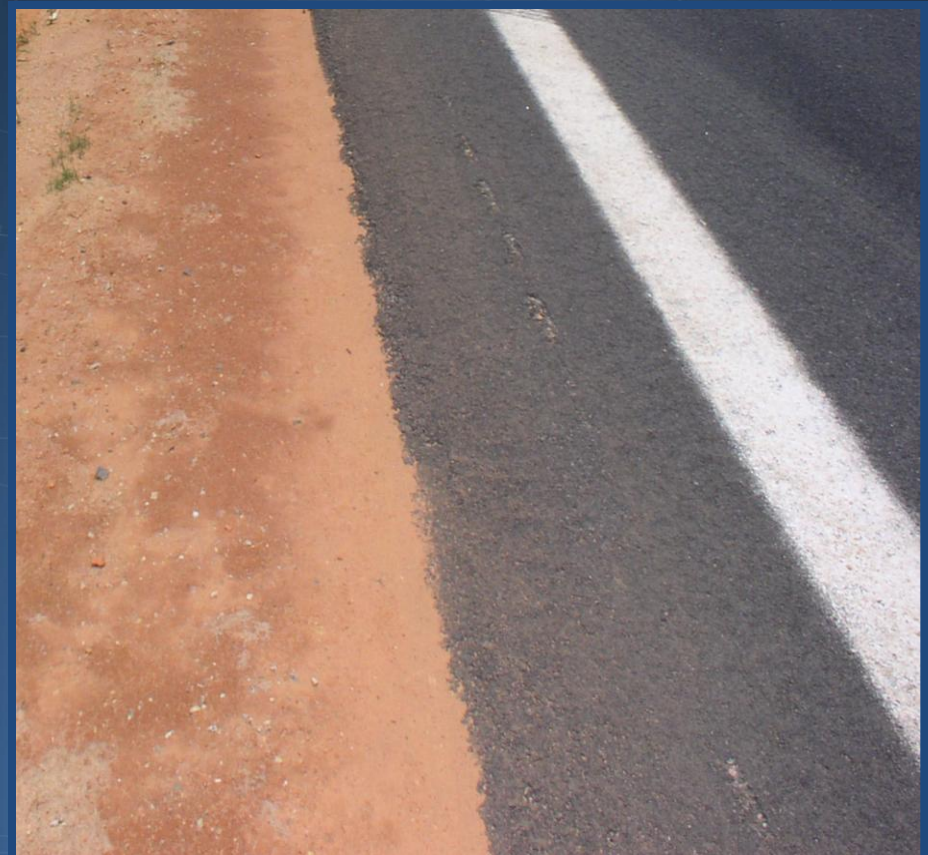


# Rolling Process



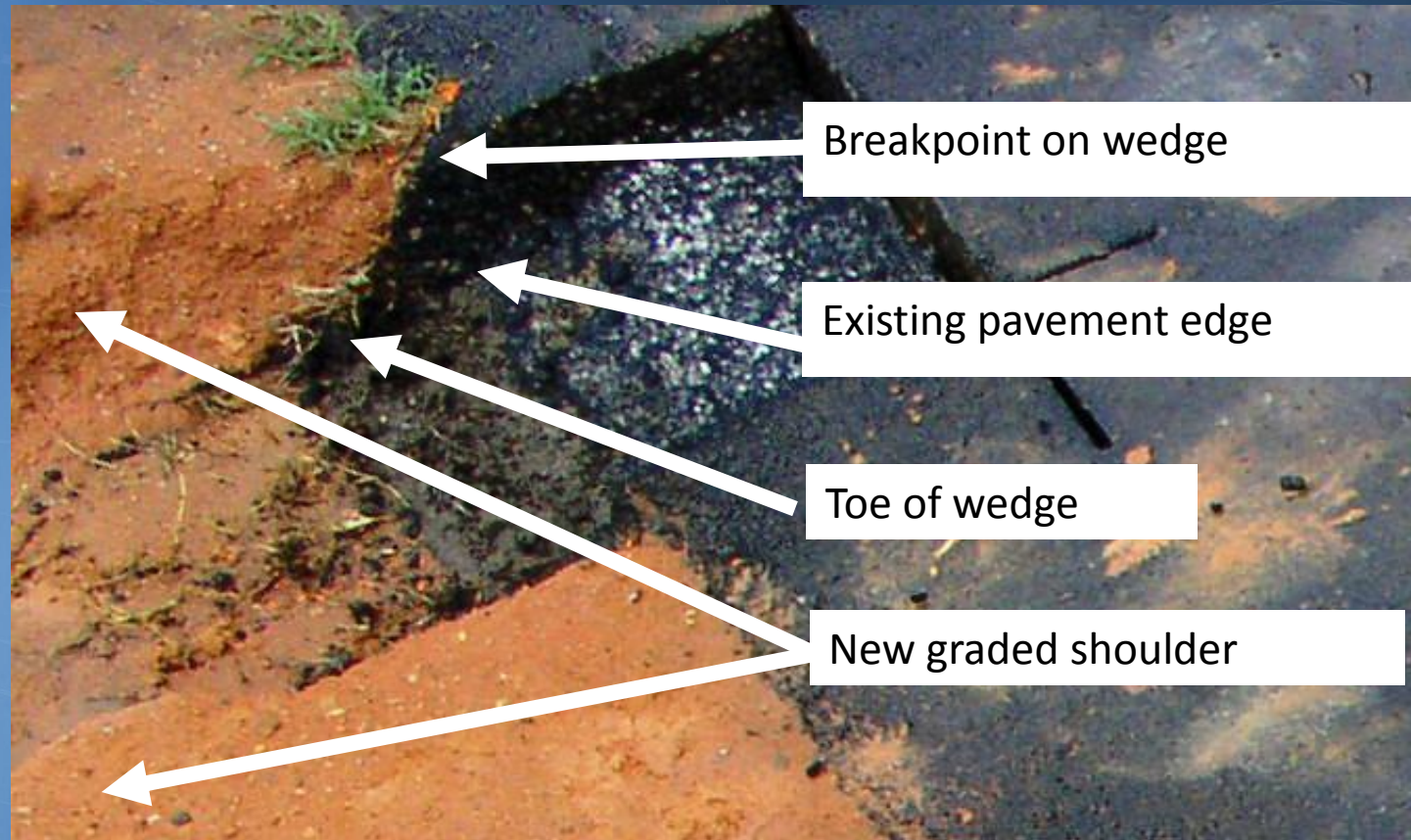


# Finished Surface





# 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







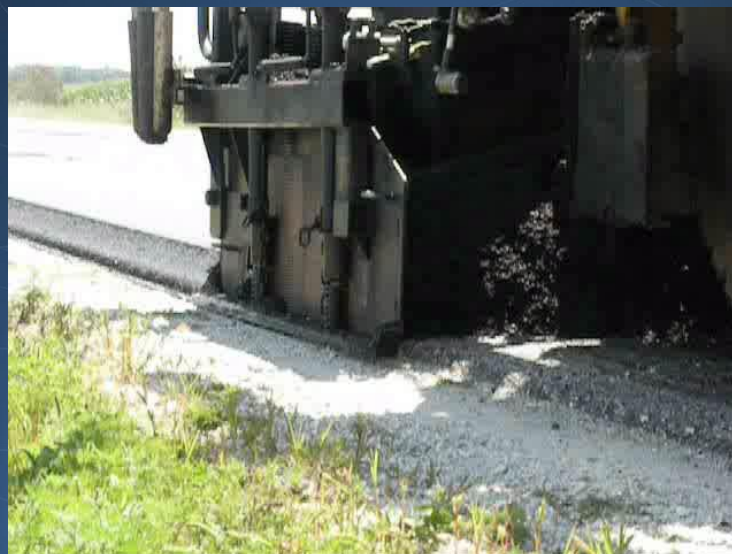
# Increased Edge Durability?



**Without Safety Edge**



**With Safety Edge**







# 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**



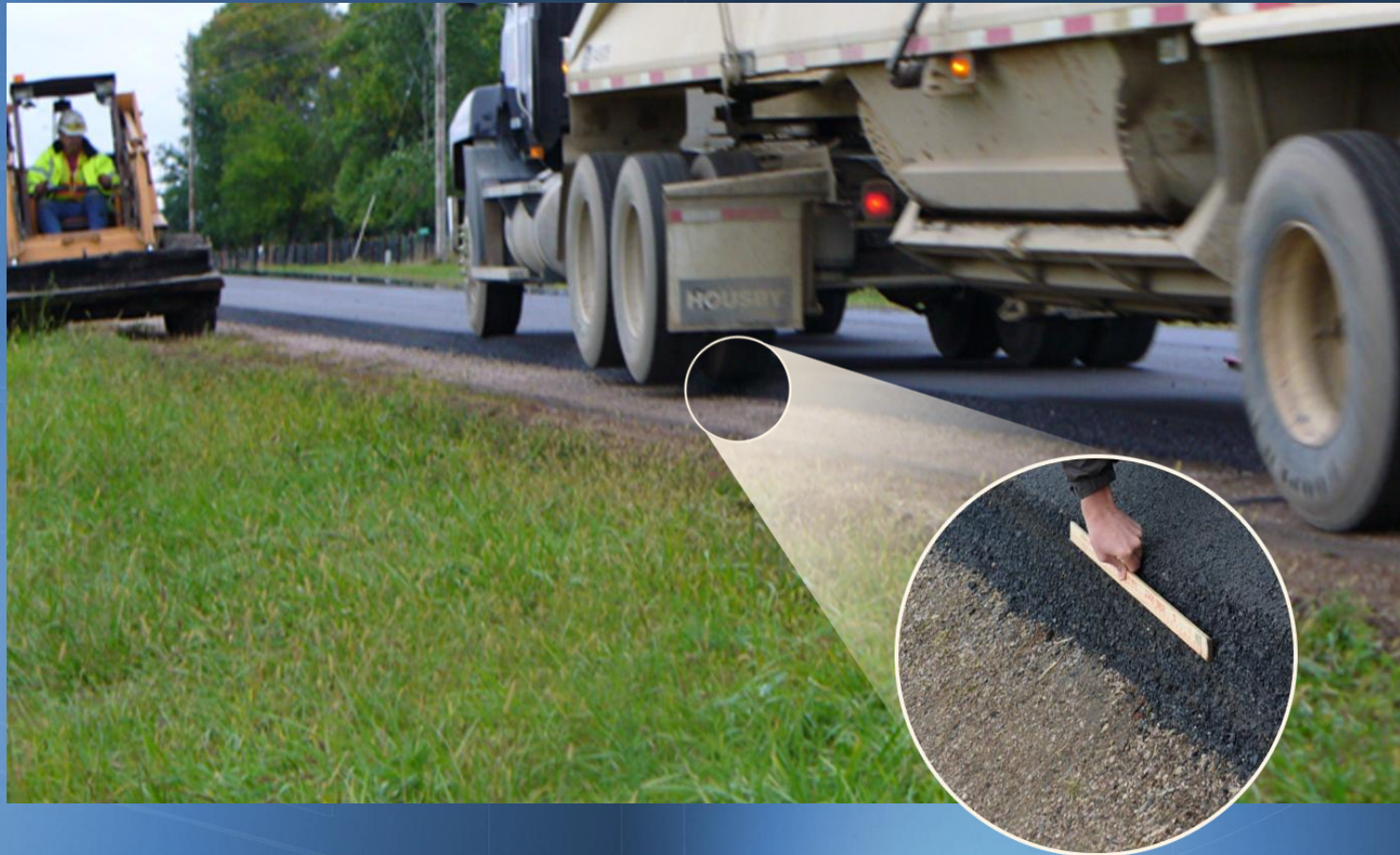
**With Safety Edge**





# 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!

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# 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

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## Contact Information

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

Landon Mays: LMays@az.dot.gov  
Kelly LaRosa: Kelly.LaRosa@dot.gov

**To learn more about EDC, visit:**

*<http://www.fhwa.dot.gov/everydaycounts>*