The Safety Edge: Minimizing The Effects of Shoulder Drop-off

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41,059 Highway Fatalities a Year
Source: 2007 FARS Data

24,801 Roadway Departure Fatalities Nationally

<table>
<thead>
<tr>
<th>Crash Type</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fatalities (All Crashes)</td>
<td>252</td>
</tr>
<tr>
<td>- Involving a Roadway Departure</td>
<td>165</td>
</tr>
</tbody>
</table>

Source: NHTSA

Two people will die from a roadway departure Accident before I am finished this presentation.

1 Fatality Every 21 minutes
21,992 Two Lane Undivided
Source: 2006 FARS Data

Focused Solution:
- Low cost
- Two Lane roadways
- Roadway Departure

Are Drop-offs a Problem?

Vehicle Re-entry

Topics
- Problem of Drop-offs
- Location of Drop-offs
- Tire Scrubbing
- One Solution
  - Construction Details
- Benefits of a Safe Pavement Edge

Was the drop-off the cause?
Vehicle Dynamics

- Head-on
- Roll Over
- Opposite Side
- Roadside Hazard

Vehicle Dynamics

- Research Conducted at TTI (mid 1980’s)
- Effects of Edge Shape on Tire Scrubbing
- Testing Parameters
  - Vertical Edge
  - Professional Driver
  - 55 mph (more recent testing at 70 mph)
  - 4 inch Drop-off
Roadside Hazards

How many Roadside Hazards can you find?

- Remove obstacle
- Redesign for safe traversing
- Relocate away from travel way
- Reduce severity of impact
- Shield
- Delineate

Roadside safety Design Guide

Horizontal Curves

Location of Drop-offs

1. **Horizontal Curves**
2. Near Mailboxes
3. Turnarounds
4. Shaded Areas
5. Eroded Areas (Drainage)
6. Asphalt Pavement Overlay

Mail Boxes
Shaded Areas

Sunlight = Vegetation

Asphalt Overlay

2” Asphalt Overlay +
Existing 5’ Drop-off =
Extreme Unsafe Condition

The Safety Edge:
A Practical Solution

Line Depicts extension of Pavement Surface

30° - 35°

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

- Clip Shoulders
- Construct Overlay
- **Pull Shoulders Flush**
- No Effect on Production
- Minimal Monitoring
- 12.5 mm or 9.5 mm SP

The Hardware

- GDOT Version IV
- GDOT Version V
- End Gate Springs

The Hardware

- Trans Tech Shoulder Wedge Maker™
- $2100

Mr. Gary Antonelli
www.transtechsys.com
**Key Features**
- Self Adjusting Spring
- ½” Radius Leading Edge
- 30° Forming Edge
- 45° Compound Angle

**Construction**

**Finished Surface**
Increased Edge Compaction?

Without Safety Edge

With Safety Edge

Tracy’s Law:

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

Tracy Cumby
TexDOT Project Director

Edge Compaction

Safety Edge

No Safety Edge

Condition After One Year In-Service

Tracy’s Law & the Texas Maintenance Assessment Program (TxMAP)

TxMAP 2002 Non-Interstate Assessment, District Overall Summary
Idaho Standard Specifications

The paver shall be equipped with a shoe on the outside of the paver to provide shapes as follows:

- On initial pavement placement, the shoe may be 450 mm (1.47 ft) wide for depths 60 mm (0.2 ft) or less. For depths greater than 60 mm (0.2 ft), the shoe shall be 600 mm (1.96 ft) wide. On all pavement overlays, the shoe shall be 900 mm (1.96 ft) wide.

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Construction

Photo by Shawna King
Iowa PCCP Safety Edge

Tort Liability

Are Lawyers Familiar with pavement edge tort liability?

IV. Edge Drop Off in Excess of (3) Three Inches is Dangerous.

The "Scrubbing Effect" was "considered to occur at edge height levels from one to five inches. Scrubbing is not a safety concern at one inch edge height but is possible. Scrubbing loses safety significance for automobiles as edges exceed five inches, since automobiles are rarely able to mount edges this high. For trucks, however, scrubbing will be important at greater edge heights."

If you or a family member has been injured as a result of a highway defect or if you are an attorney that would like to discuss your clients case for co-counsel or referral opportunities, please feel free to contact Attorney Dan Chamberlain at 1.800.269.XXXX.

Taken from www.tortslaw.com.

Benefits of A Safe Edge

- Temporary Safety benefit during construction
- Permanent Solution for future drop-off re-emergence
- Reduce tort liability – Providing “Due Care”
- Aid vehicle re-entry
- Minimal hardware, labor, or material costs
- Increased Pavement Edge durability

Safety Edge Implementation Status

<table>
<thead>
<tr>
<th>States implementing</th>
<th>States Project in Progress</th>
<th>States Inquiring</th>
<th>States without activity</th>
<th>States with only County Activity</th>
</tr>
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<td>Poolfund States</td>
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States with only County Activity

Poolfund States

Temporary Safety benefit during construction
Permanent Solution for future drop-off re-emergence
Reduce tort liability – Providing “Due Care”
Aid vehicle re-entry
Minimal hardware, labor, or material costs
Increased Pavement Edge durability
Other Solutions

- Increase paved shoulder width
- Maintain flush stabilized shoulders
  - Aggregate, RAP
- Paved turnouts near mailboxes
- Remove roadside hazards
- In combination w/ rumble stripes
- Place sod along pavement edge

More Information

- http://safety.fhwa.dot.gov/roadway_dept
- www.pooledfund.org
  - TPF-5(097) Evaluation of the Safety Edge
  - Specifications and Drawings

Any Questions??

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