

The Safety Edge



Introduction:

- Problem areas are highways with little or no paved shoulder
- Repaving or an overlay with aggregate or earth shoulders that may deteriorate over time
- Creates a 2” to 5” vertical drop-off along the edge of pavement
- Drop-offs are safety hazard for vehicles that leave the roadway and try to return safely



Run off the road vehicles may be caused by:

- Driver inattention
- Speeding
- Impaired Driving
- Poor Visibility
- Avoidance of an obstacle

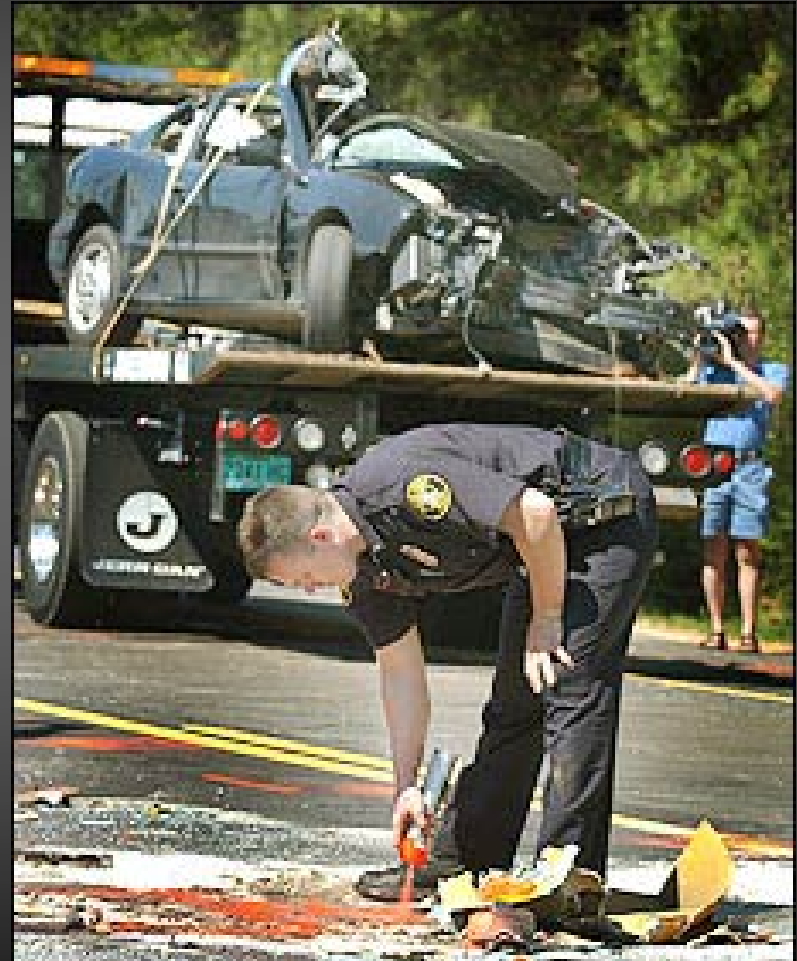
Pavement edge drop-offs occur at:

- Horizontal Curves
- Near Mailboxes
- Turnarounds
- Shaded Areas
- Eroded Areas
- Asphalt Pavement Overlays



Possible Results:

- Head-on collision with opposing travel lane(s)
- Side-swipe of opposing travel lane(s)
- Run-off road and crash onto opposite side of roadway
- Overturn the vehicle into either lane of traffic
- Fail to re-enter roadway



Possible Alternatives:

- Regularly maintain shoulders so they are flush to roadway
- Develop a sloped angle at the edge of pavement during construction creating a wedge rather than a vertical edge. This wedge is currently referred to as a “safety edge” or “edge wedge”.



Safety Edge



No Safety Edge



Condition After One Year In-Service

Benefits of Safety Edge:

- Presents less resistance for vehicle tires to “rub” along vertical edge drop-offs during vehicle re-entry
- Can lead to a smoother, more controlled entry into the travel lane

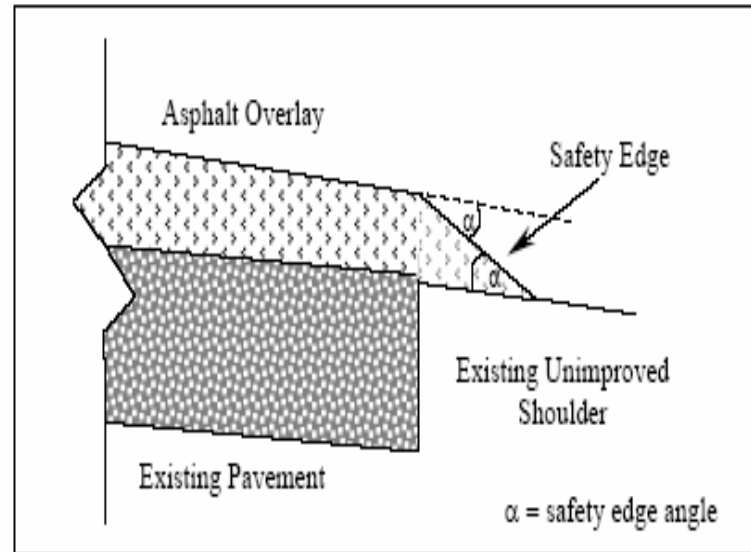


FIGURE 1: Safety Edge Detail

Transportation Pooled Fund Program Objectives:

- Evaluate the effectiveness of the safety edge to help prevent and reduce the severity of pavement drop-off related crashes
- Before-after evaluation of accident data will be performed on sites with installation of the safety edge across the U.S.

Transportation Pooled Fund Program

Initial Scope:

- Participants include CA, GA, IN, NC, and NY
- Initial scope to conduct a research project totaling \$500,000 over three years (2004-2007)
- Approximate amount of funding requested per state is \$15,000 per year for three years
- Total anticipated state funds are \$225,000 over 3 years with FHWA contributing \$275,000

Georgia DOT Hardware:

- Rounded bull-nose leading edge and slight tilt to the smoothing flat section
- Critical to have at least 5” vertical jog for varying drop-off heights
- Mounting plate bolted to side extendable gates



TransTech Hardware:

- Self-adjusting spring to allow mounting plate to follow roadside surface
- Angled surface that pre-compacts asphalt
- Another fixed angle surface forms the ramp edge



Indiana Participation in 2004:

- One project - SR 13 in Kosiosco County
- 10.77 mile project including 1.0 mile of curb
- Construction by Phend & Brown
- Safety edge placed on Intermediate and Surface courses
- Used TransTech device for construction



Intermediate Course:



Wedge looked good until vibrated with breakdown rollers

Intermediate Course:



- Wedge pushed out on top
- Dimensions did not change from after breakdown roller to after finishing roller

Intermediate Course:

- End gate was not fully down on the intermediate course
- End gate was not compacting wedge like supposed to so while the roller was doing the compacting of the mat pushing the wedge out
- Once the end gate was lowered, the wedge appeared to set up the way it was supposed to after compaction of the mat

Surface Course:



Better results than Intermediate course

Aggregate Shoulder:



- It is recommended to use the safety edge with current specifications. Here it is used in combination with an aggregate shoulder.
- The shoulder is pulled flush against the safety edge

Future Safety Edge Projects in Indiana:

- Projects let for 2005 construction season, would like at least ten to be included in the program
- There is to be a special provision included in the contract
- Cost of safety edge is to be included in the cost of the asphalt, estimated around 1%-2% of total cost of asphalt
- Contractor can use whatever device they choose or develop their own as long as it creates about a 30° angle along the edge of pavement
- Only construct surface courses with the safety edge

Contract #		Road		District	Length	County	Paved Shoulder	Scope	ADT	ROR Acc ('02 & '03)	Acc Type
RS	27756	SR	18	Crawfordsville	16.43	Benton	0	2 Lay	1100	0	
RS	27749	US	136	Crawfordsville	8.35	Fountain	0	2 Lay	2700	0	
RS	27495	SR	39	Seymour	2.13	Morgan	0	2 Lay	3000	0	
RS	27737	SR	42	Crawfordsville	13.65	Morgan	0	2 Lay	1000	0	
RS	27104	SR	65	Vincennes	10.95	Vanderburgh	0	2 Lay	2600	0	
RS	27106	SR	37	Vincennes	8.90	Crawford	0	2 Lay	1400	0	
RS	27955	SR	11	Seymour	5.13	Jackson	2'	2 Lay	6000	0	
RS	26402	SR	101	Seymour	8.61	Franklin	2'	2 Lay	4100	0	
RS	27771	SR	62	Vincennes	14.02	Warrick	2'	2 Lay	3400	0	
RS	27584	US	231	LaPorte	6.31	Jasper	2'	2 Lay	6400	1	PD
RS	27799	SR	17	LaPorte	6.54	Cass	0	2 Lay	2600	0	
RS	27543	SR	44	Greenfield	8.51	Fayette	2'	2 Lay	7100	0	
RS	27594	SR	64	Vincennes	4.38	Dubois	1'	2 Lay	6500	1	PD
RS	27759	US	136	Crawfordsville	8.35	Hendricks	2'	2 Lay	5600	0	
RS	27547	SR	26	Greenfield	7.60	Jay	0	1 Lay	1000	0	
RS	27946	SR	39	Seymour	15.59	Washington	0	1 Lay	1300	0	
RS	27769	SR	68	Vincennes	13.00	Gibson	0	1 Lay	2000	1	Injury
RS	27947	SR	44	Seymour	13.63	Morgan	0	1 Lay	1900	1	Injury
RS	27958	SR	160	Seymour	18.24	Washington	0	1 Lay	1900	1	Injury
RS	27949	SR	58	Seymour	6.45	Jackson	0	1 Lay	1000	0	

Indiana Objectives for Pooled Fund Program:

- Collect accident data before and after construction for each section of roadway
- Evaluate the constructability of the safety edge and look at the devices the contractors choose to use
- Evaluate the performance and durability of the safety edge

Questions or Comments?