

## Preventing dangerous edge drop-offs

ABOUT 25 PERCENT of fatal crashes in Iowa involve a single vehicle that runs off the road; nationally, this is the primary type of crash in rural areas.

When a vehicle leaves the road, drop-off or rutting at the pavement edge can contribute to the driver losing control. A significant difference in elevation between the shoulder and pavement may cause the driver to overcorrect as he or she steers back onto the roadway, sending the vehicle into the opposing lane where it may spin out or hit an oncoming vehicle. Properly maintaining pavement edges and shoulders can help prevent such crashes, improving motorist safety and reducing tort liability claims.

### Causes

Several factors can cause or exacerbate edge drop-off or rutting:

- erosion caused by surface drainage runoff, by wind, or by wind currents created by large, fast-moving commercial vehicles
- settlement of the shoulder or degradation of shoulder granular material
- high traffic volumes, particularly heavy commercial traffic
- off tracking by wide vehicles

The most serious shoulder deterioration occurs in the first two feet from the pavement edge.

Certain locations along roads with earth or granular shoulders may be especially prone to edge rutting. Steep hills, the low side of super elevated curves, and intersections commonly exhibit more severe edge rutting than relatively flat, straight locations.

Edge drop-offs also occur during asphalt overlay operations. The Iowa DOT has responded to this problem with design procedures that avoid significant edge drop-offs adjacent to open traffic lanes during overlay operations. Local agencies may want to include the use of sloped fillets along the overlay edge, along with shoulder rehabilitation, in every overlay contract.

Although pavement edge drop-off is most common with unpaved shoulders, settlement of paved shoulders can also result in a difference in elevation between the shoulder and adjacent pavement.

### To pave or not to pave the shoulder?

Almost exclusively, Iowa's lower volume, local and state rural roads have earth or sod and granular surfaced shoulders. Unless the topography promotes

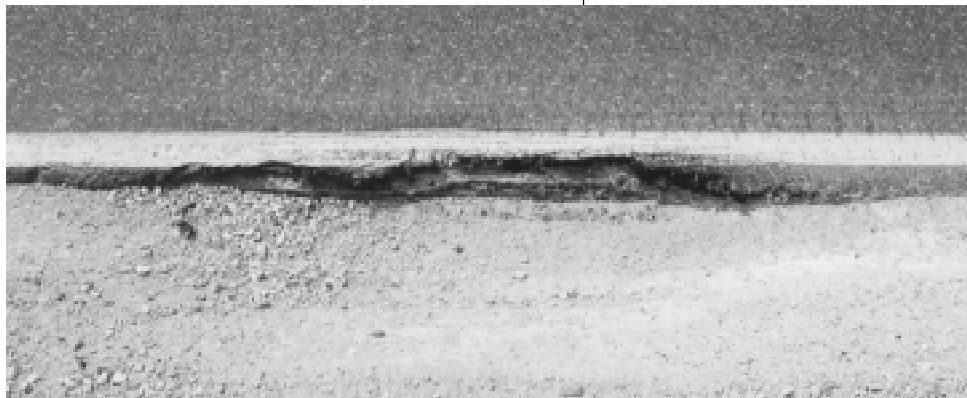
edge rutting, a good quality earth or sod shoulder can provide excellent service on these roads.

The Iowa DOT specifies paved shoulders only on very high-volume and Interstate roadways. Specs include a 14-foot wide paved traffic lane that, when striped for a conventional 12-foot wide travel lane, provides a two-foot wide paved shoulder.

### Maintenance suggestions

Pavement edge drop-offs of three to four inches or more are generally considered unsafe. Iowa DOT maintenance standards are more stringent, requiring corrective action when drop-offs approach two inches.

A dangerous combination of pavement edge rutting and shoulder degradation



Include shoulder maintenance in your regular maintenance schedule. These activities should include

- regularly repairing bituminous shoulders,
- sealing edge ruts, and
- replacing aggregate and blading unpaved shoulders.

At locations prone to rutting or erosion, consider installing low-cost asphalt widening units, approximately two feet wide. This improvement can be made by agency maintenance staff on a flexible schedule and can significantly reduce future maintenance needs in these often troublesome locations.

### For more information

Contact Safety Circuit Rider Tom McDonald, 515-294-6384, [tmcdonal@iastate.edu](mailto:tmcdonal@iastate.edu).

Also, see *The Elimination or Mitigation of Hazards Associated with Pavement Edge Dropoffs During Roadway Resurfacing* (P1001), an AAA Foundation for Traffic Safety publication, and the Iowa DOT shoulder maintenance standard. To borrow these publications, contact Jim Hogan, CTRE's library coordinator, 515-294-9481, [hoganj@iastate.edu](mailto:hoganj@iastate.edu).