

Shoulder Maintenance

Too Important to Defer until the Spring

Road shoulders are an important part of the roadway. Yet, in the rush to complete projects before winter, some agencies defer shoulder work until spring. Deferral can result in shoulders not serving all their purposes, which are:

- To provide side support to the pavement.
- To drain water away from the pavement and into ditches.
- To provide a safe area for emergency use by vehicles.

To fulfill these purposes, the shoulder and pavement edges must be level, and the shoulder slope steeper than the pavement slope. These characteristics are necessary to drain snowmelt as well as rainfall. With non-level, rutted, or inadequately sloped shoulders, snow-pack and ice accumulate at the pavement edge. Snow and ice melt fastest next to the pavement, and create a mini-ditch. Water will seek the easiest path, which is often underneath the pavement. Freeze-thaw cycles crack the water beneath the pavement and loosen the base material beneath it. In a matter of days, water penetrates further into the roadway, and freeze-thaw cycles cause additional damage. This process can cause alligator cracking several feet wide.

Also problematic are shoulders with steep or eroded slopes. They lead to more erosion, which weakens the pavement edge. Eroded materials travel into ditches, and ultimately into lakes and streams. Agencies should repair these situations in the fall to reduce the effects of spring snowmelt.

When to Repair Shoulders

Fall shoulder repairs, therefore, slow roadway deterioration, save money, and reduce environmental impacts. Agencies should repair dirt or gravel shoulders that show one or more of the following conditions:

1. The shoulder surface shows ruts and corrugations over one inch deep.
2. The slope is too flat to provide good drainage.

3. The shoulder has eroded into cuts and gullies, causing cracks in the pavement edge and/or excessive material being carried into ditches.
4. There is more than a two-inch drop-off from the pavement to the shoulder.

Asphalt shoulders need repair if they are cracked, or there is gap along the pavement edge.

How to Repair Shoulders

Highway departments can correct dirt or gravel shoulders by “reshaping” or “replenishing.” Reshaping corrects the first two defects. With a motor grader, crews can shape and smooth the shoulder slope. They should compact the shoulder, ensuring level shoulder and pavement edges.

Replenishing corrects the third and fourth defects. Crews reshape and compact the existing surface. They then add, spread, and compact additional material. The added material should be granular and well graded.

Shoulders must support vehicle loads. Their materials, therefore, should be similar to the road base. Before reshaping or replenishing, it might be necessary to remove organic debris, clays, silts, and other unsuitable materials.

Asphalt shoulder repairs are the same as repairs applied to the road. Sealing gaps between the shoulder and pavement are necessary to prevent freeze-thaw effects.

Highway departments should also consider reshaping ditches. This is especially important if poor ditch drainage will affect the repaired shoulder.

Many UNH T² Center publications and videos describe details of these repairs. Call or email the office for desired information.

Sources

- Guide to Common Road and Equipment Maintenance Procedures*. 1989. Louisiana Transportation Research Center. Baton Rouge, LA.
Shoulder Maintenance. 1995. Pennsylvania Local Roads Program Technical Information Sheet #62. Harrisburg, PA