Water on roads can cause erosion and road degradation; thus, road BMPs:
- divert water off roads
- reduce velocity & energy of water on roads

Water Diversion, Erosion Control, and Road Building
Water Diversion, Erosion Control, and Road Building

Water on roads can cause erosion and road degradation; thus, road BMPs aim to divert water off roads and reduce the velocity and energy of water on roads.
Roadbed Grade

**Normal soils**
- Normal $\leq 10\%$

**Erodible soils**
- $< 8\%$ grade
- $> 8\%$ up to 150’ with erosion control
- Armor road surface with gravel

Lessen grade at stream approaches ($> 50’$)
Outslope roads in & out slope used with higher slopes.
Active Road Drainage: Wing Ditches

- Same depth as side ditch
- 30-45 degree downslope departure from road line
- Outslope 1% erodible, 2% on stable soils (*low gradient*)
- Removes water from ditch and in forest floor

**Spacing:**
- 2-5% 200’
- 5-10% 100’
- >10% 75’
Active Road Drainage: Wing Ditches

- Same depth as side ditch
- 30° - 45° downslope departure from road line
- Outslope 1% erodible, 2% on stable soils (low gradient)
- Removes water from ditch and in forest floor

Spacing:
- 2 - 5%: 200'
- 5 - 10%: 100'
- > 10%: 75'
Utilize 50 ft before stream crossing - divert water and sediment before stream
Haul Roads: Broad Based Dips (fast travel)

- High speed roads
- Roads with <10% grade

Spacing:
- 1-2%: 300’
- 2-4%: 200’
- 4-6%: 165’
- 6-8%: 150’
- 8-10%: 140’
Haul Roads: Broad Based Dips (fast travel)

- High speed roads
- Roads with <10% grade

Spacing:

- 1-2%: 300'
- 2-4%: 200'
- 4-6%: 165'
- 6-8%: 150'
- 8-10%: 140'

3% Slope

3% Outslope

Road Surface and Broad Base Dip pitch

3% Slope

140-300 feet

Drain zone length

20-30 ft

Original Grade

6 inches deep
Haul Roads: Rolling Dips (slow speed)

For roads with grade ≥ 10%

Spacing
- 10-15% 135’
- > 15% 120’
Skid Trails & Inactive Roads

- Minimize disruption of natural drainage patterns
- If slope > 20%, skid uphill
- Don’t skid in stream channels
- Skid trails ≤ 30% grade
- Straight runs (≤300’ with 20% grade)
Water bars (inactive)

**Angle 30-45%**
- Divert, not dam
- Angle of water bar reduced with slope of road / trail

Disperse water on undisturbed forest floor
Water bars (inactive)

- Spacing: 2% - 5% 250’
  - 5%-10% 135’
  - 10%-20% 80’
  - 20%-30% 45’
  - >30% 35’
Water bars (inactive)

- **Spacing:**
  - 2% - 5%: 250’
  - 5% - 10%: 135’
  - 10% - 20%: 80’
  - 20% - 30%: 45’
  - >30%: 35’
Water Diversion and Erosion Control
Roads & Trails
Water Diversion and Erosion Control
Roads & Trails
Water Diversion and Erosion Control
Roads & Trails

The steeper the slope, the more diversions are needed.
### Table 11.1

**Recommended Seeding Rates**

<table>
<thead>
<tr>
<th>Area</th>
<th>Spring and Early Summer (March – June)</th>
<th>Late Summer, Fall and early Winter (August – February)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seed Mixture</td>
<td>Seed Mixture</td>
</tr>
<tr>
<td>Mountains</td>
<td>Orchard Grass (late spring)</td>
<td>Annual Ryegrass</td>
</tr>
<tr>
<td></td>
<td>Browntop Millet</td>
<td></td>
</tr>
<tr>
<td>Statewide</td>
<td>Elbon Rye; Winter Wheat</td>
<td>Elbon Rye; Winter Wheat</td>
</tr>
<tr>
<td>Gulf Coast or Delta</td>
<td>Bahia</td>
<td>Bahia or Annual Ryegrass</td>
</tr>
<tr>
<td></td>
<td>Browntop Millet</td>
<td></td>
</tr>
</tbody>
</table>

- *Broadcast Application; a soil pH of 6.5 to 7.5 is best; One ton of limestone equivalent to 1 point Soil pH+ (plus); One ton Sulphur Equivalent to 1 point Soil pH-(minus).
- Fertilize with 200 lbs per acre of 15-15-15
- Mulch slopes with 4,000 lbs of straw per acre
Road Retirement – Inactive Roads

- Stabilize road surface with waterbars

Revegetation:
- Favorable soil and weather conditions
- Follow recommended rates, methods
- Reinspect revegetation efforts

- Block vehicular traffic

**REINSPECT WORK!**