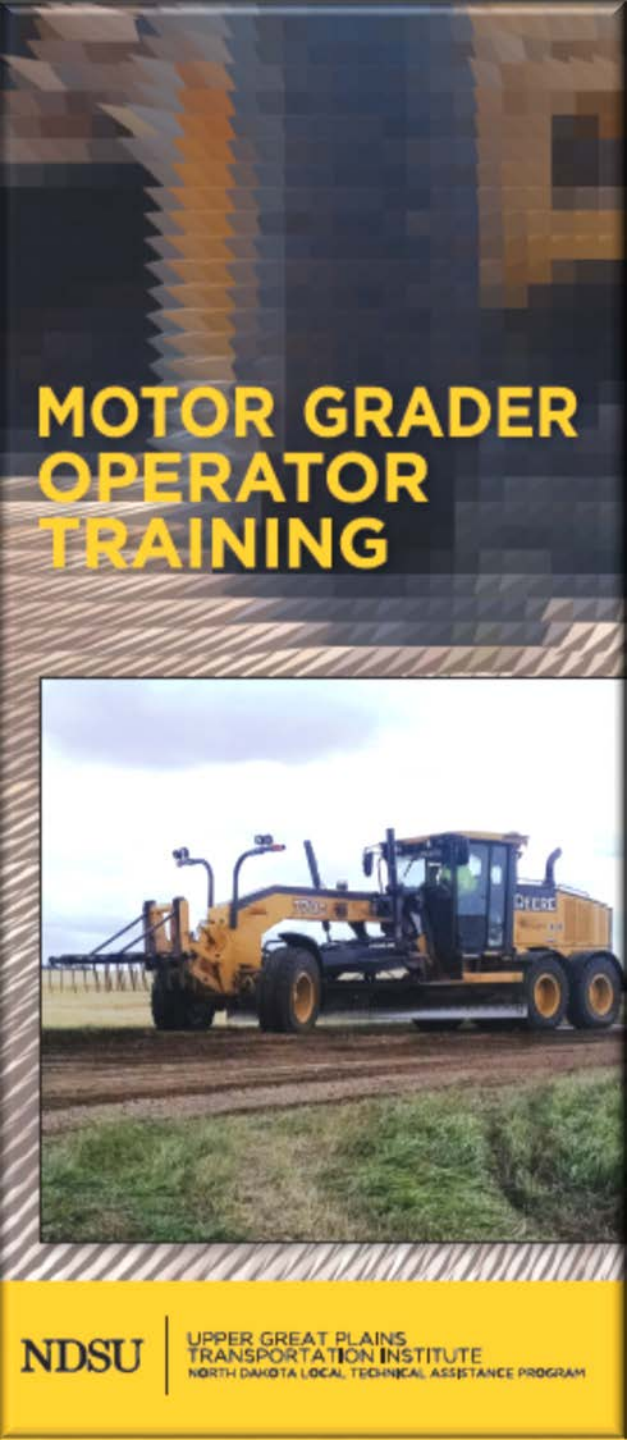


Motor-Grader Maintenance Presentation

NDACE Convention

Jan.22-23, 2015

Corey Uhrich 701-740-2308

Knowledge You Will Aquire – Classroom Session

- Operation/maintenance costs
- Road shape/shoulders
- Cutting edges
- Grading techniques
- Percentage of slopes/check

Knowledge You Will Aquire – Classroom Session

When to reshape

Compaction

Good gravel

Knowledge You Will Aquire – Classroom Session

- Materials & testing
- Stock piles
- Quantities and spreads
- Why water is important
- Soil composition
- Attachments

Hands On

- Check wear components and edges
- Mark circle @ 12’
- Pull center pin for changing edges and vertical grading
- 2 pass Straight blade with no windrows for bits
- 2 pass Blade down for float on road with good crown and shoulders
- 2 pass feather to crown for road with high traffic pounding down crown

Hands On

4 pass down and up to cut out washboards, mix gravel

5 pass to equalize lanes for uniform %

4 or more passes for spot repairs

4 or more to repair segregation or placing gravel (windrow and leave 1” each pass)

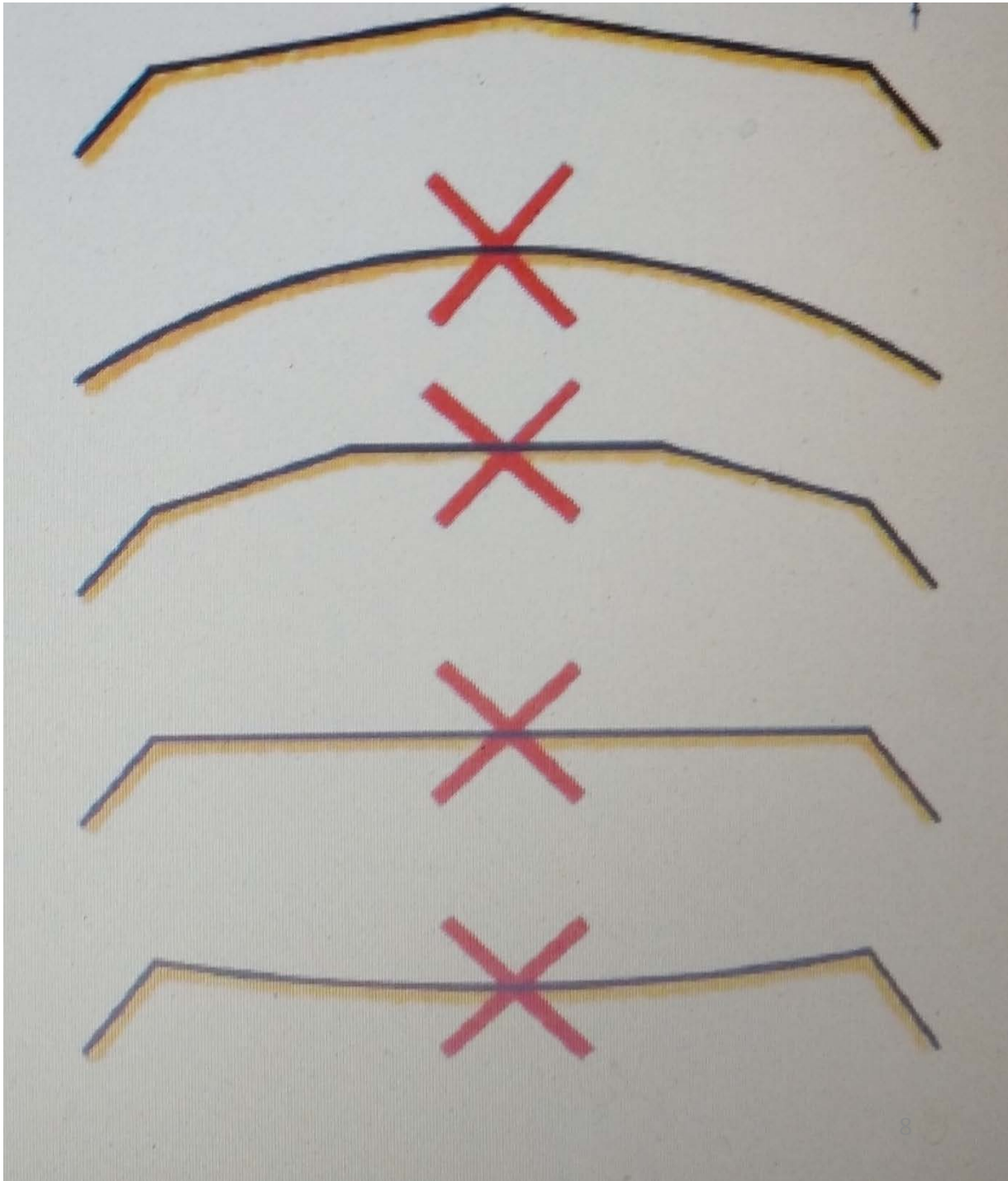
Hands On

Blade position for windrow inside tandems down to 2’ pass

Repair a super, high shoulder, or ditch

If your newer, we will focus on machine control

Proper Shape



When and when not to have a crown

The primary road should retain its crown

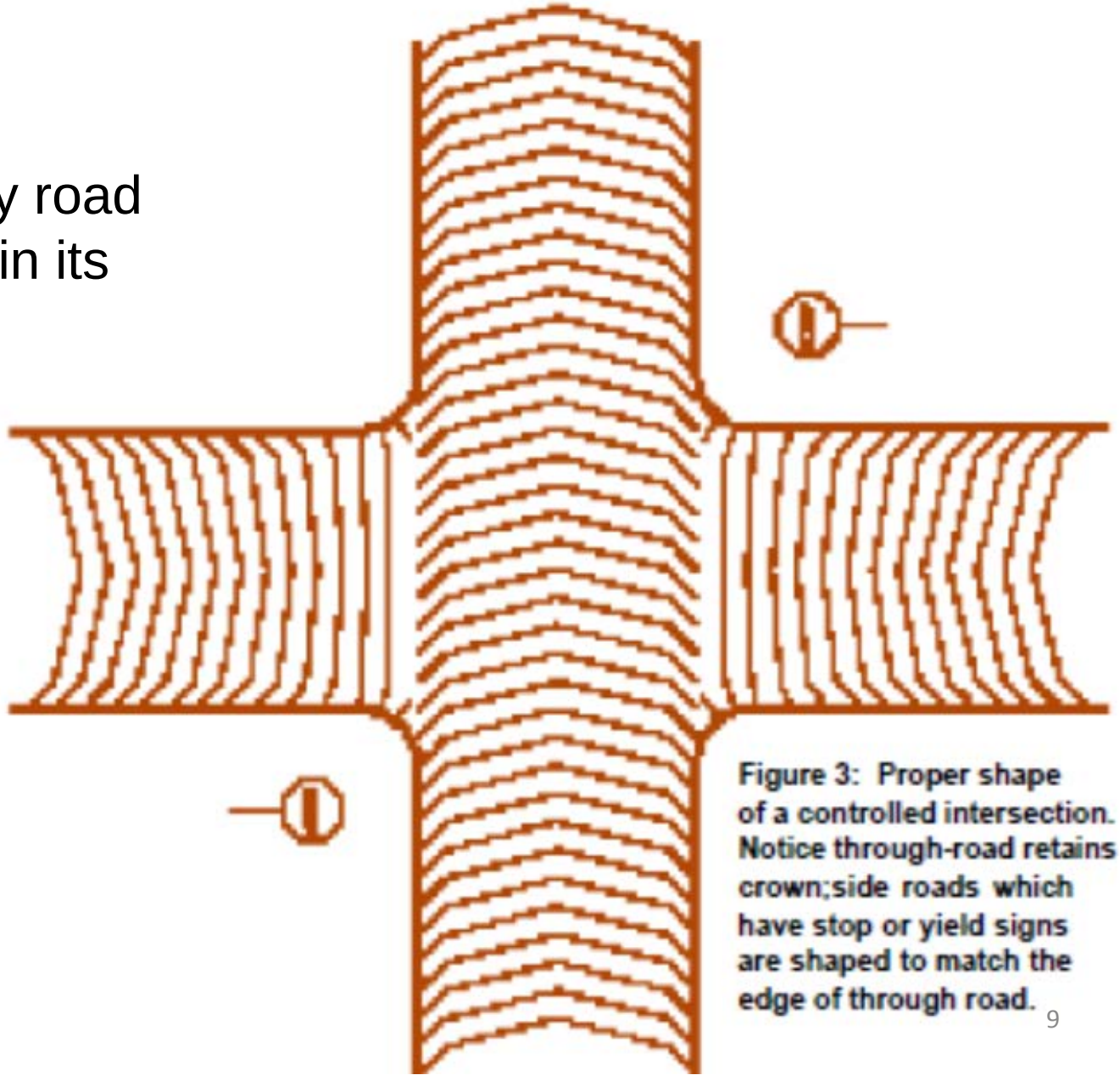


Figure 3: Proper shape of a controlled intersection. Notice through-road retains crown;side roads which have stop or yield signs are shaped to match the edge of through road.

1.6 million miles of unpaved roads in the US (53%)

1 vehicle
1 year
1 ton dust per mile

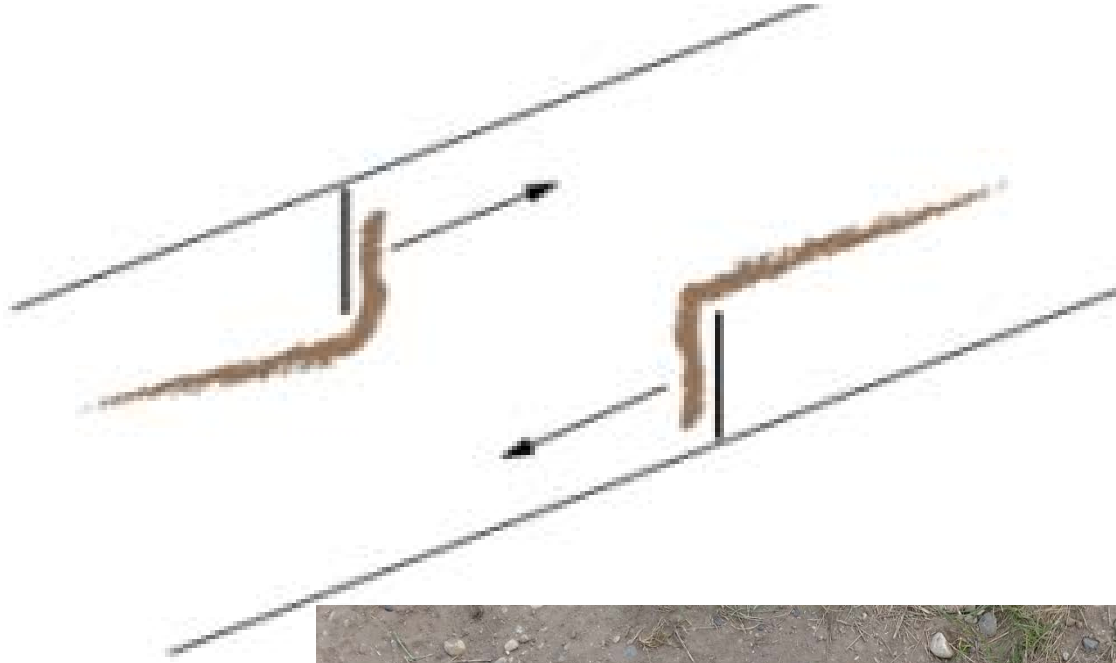
Each mile with 100 cars per day
= 100 tons of fines per year!

Segregation/float

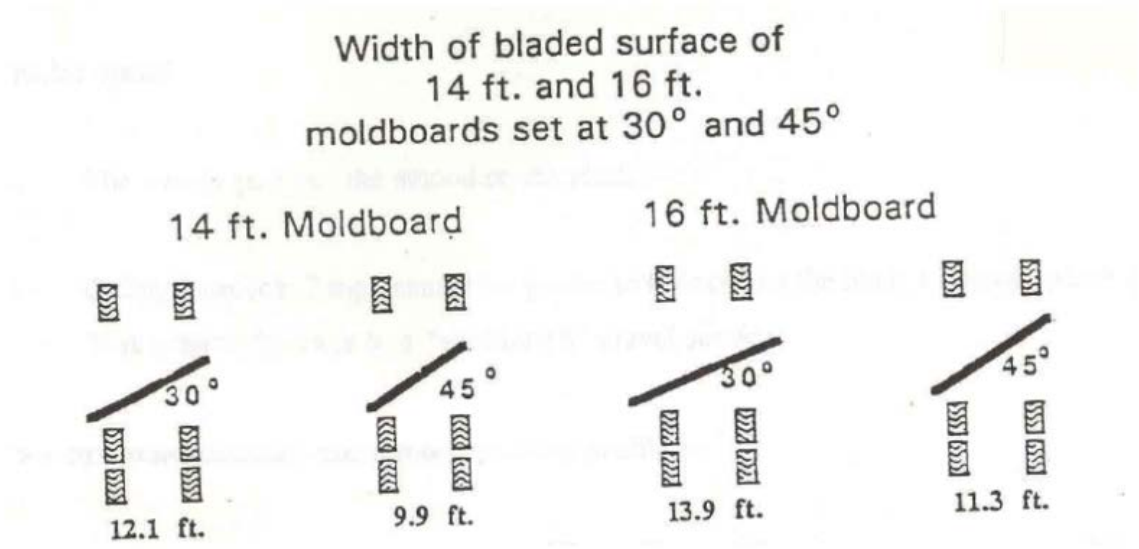
4 pass – try it for cutting out and mixing gravel

Road better last at least twice as long as 2 pass method

Never blade down middle (unless?)



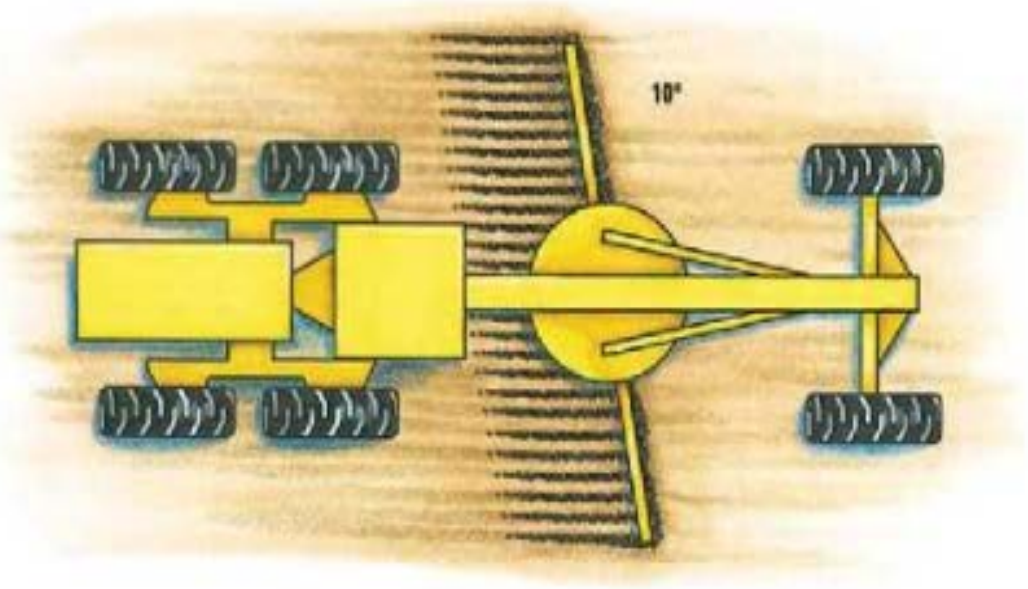
Compare equipment with your road width design



Notch circle at 12’

No windrows with bits

If you have a windrow, you have cut through too much crust!

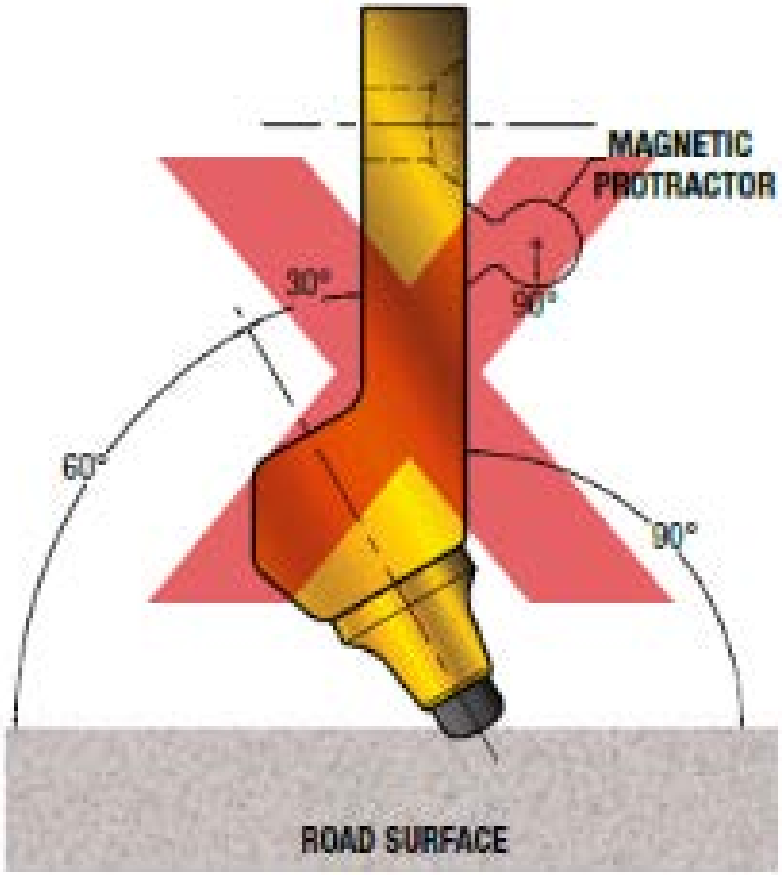


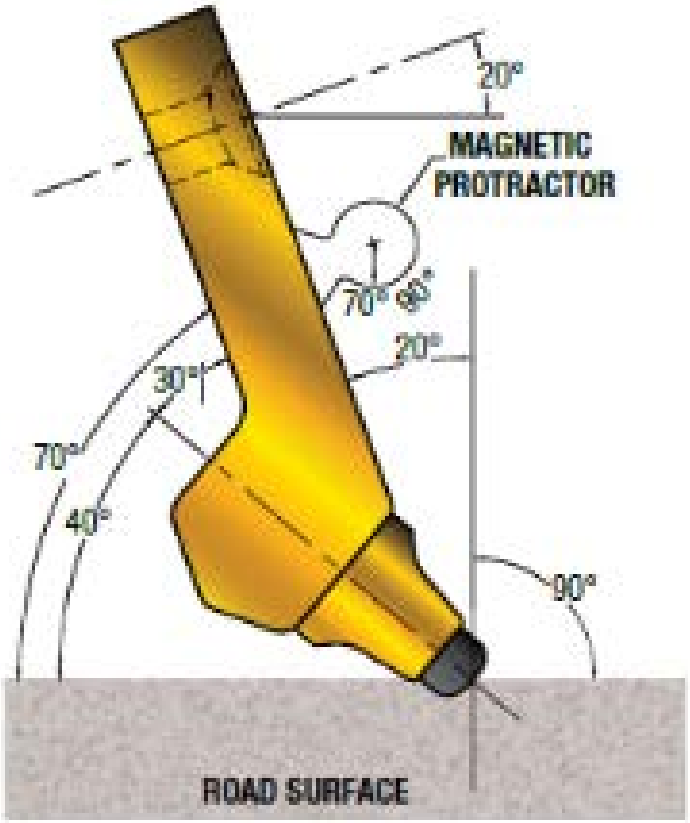
Blade Angle

To help determine proper blade angle, here are a few rules of thumb that apply:

- Use the widest pass width.
- Increase the blade angle if material begins to flow around the leading edge of the moldboard.
- Use a 10 percent blade angle when using a Grader Bit System or serrated blade edge.

Use magnetic protractor

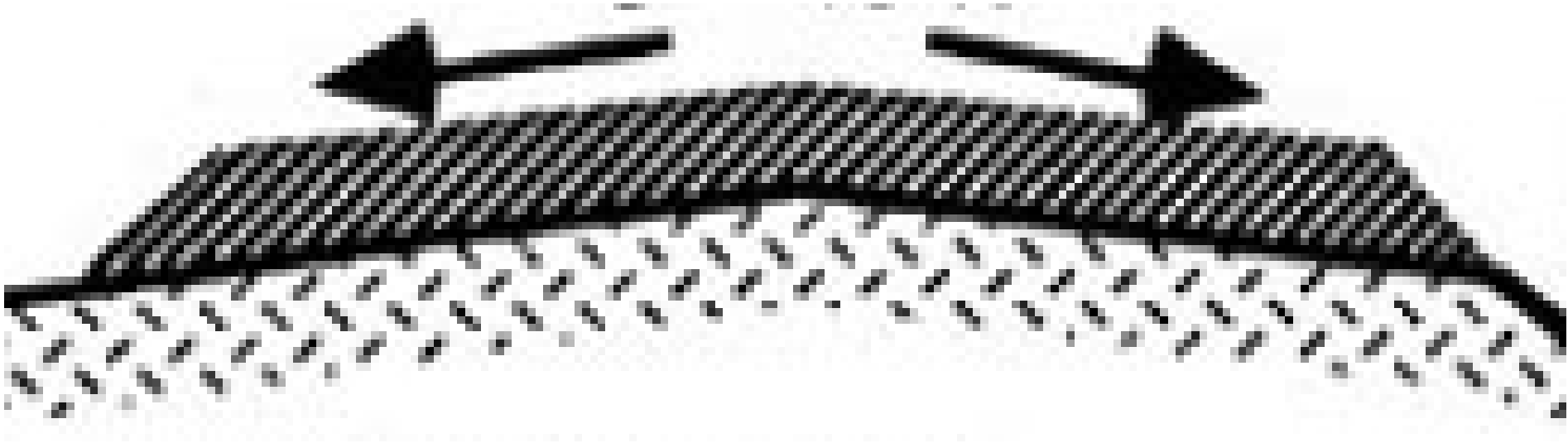




2% for future pave 4% for unpaved

2% is ¼” per foot 4% is ½” per foot

Gravel at or near 4%



Use Slope Meter

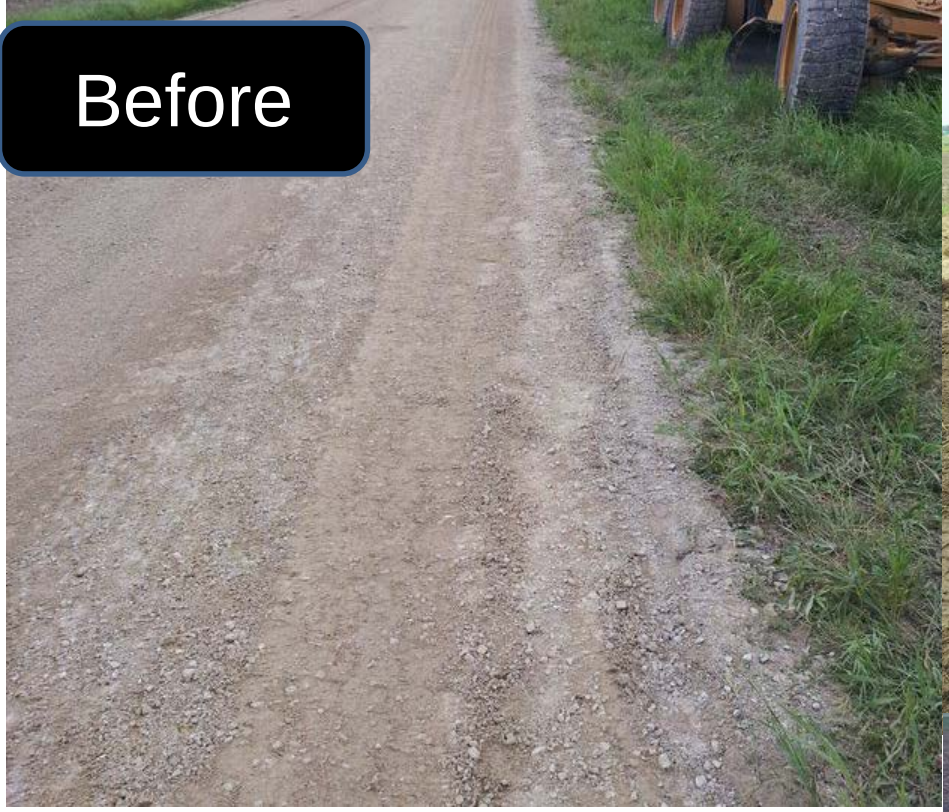
High shoulders
“berms”
“curbs”
The engineering term is “secondary ditch”

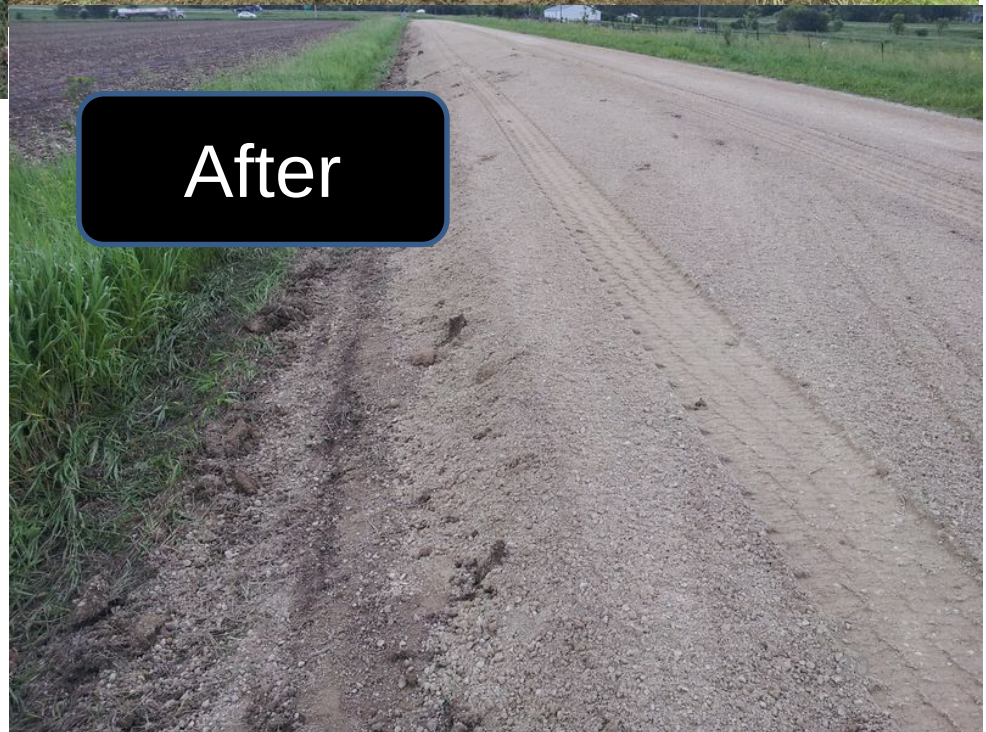
Recovering & Spreading

If there is little or no vegetation on the shoulder, simply extend the moldboard out into the shoulder material and begin to pull it onto the roadway

The material recovered is often good gravel that needs to be returned to the roadway surface

5280x0.6x16/27x1.2=2,253cy
@ $10/cy= **$22,253 per mile**!





Wrong time of year

Use shoulder disc 1st

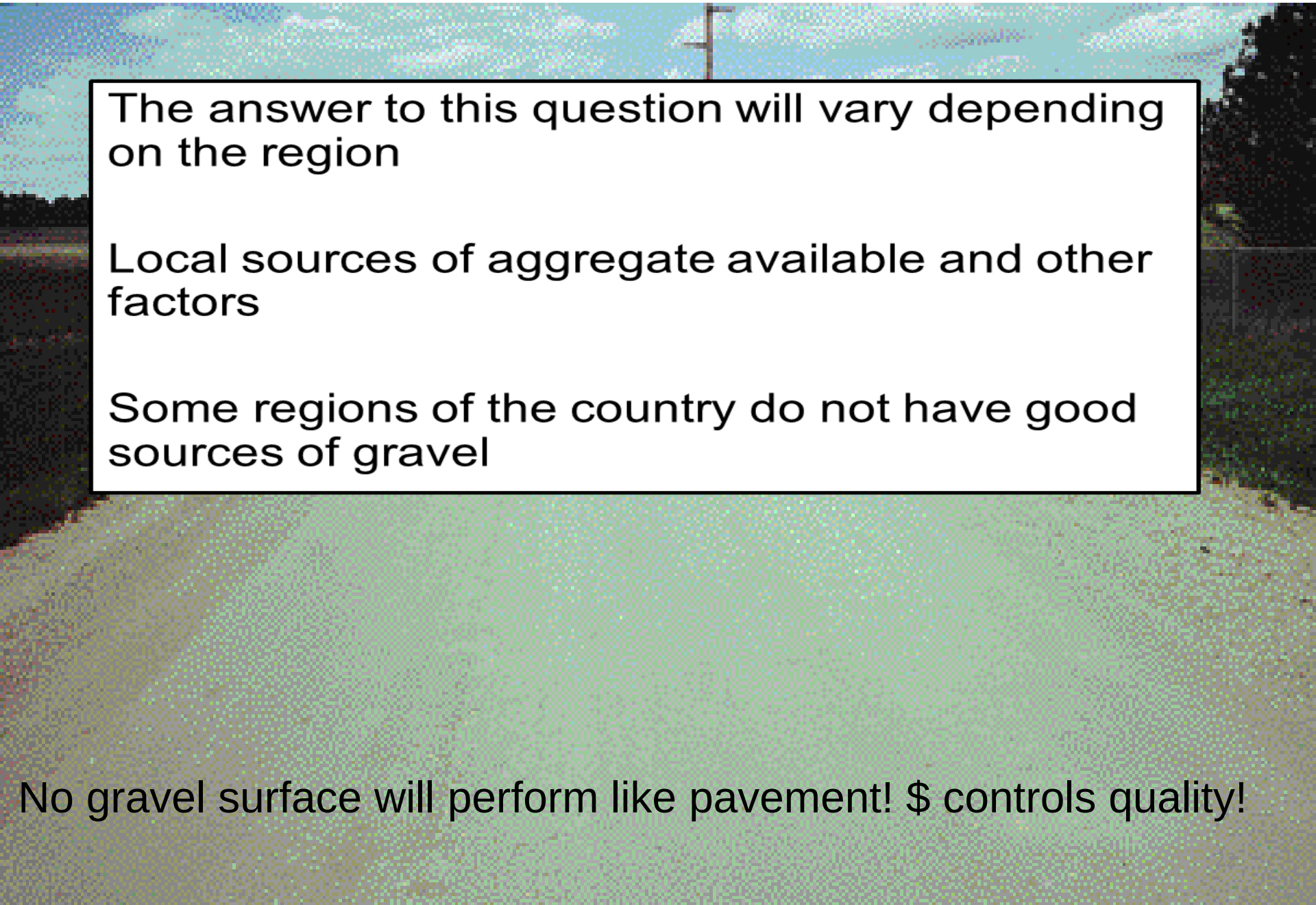
When to do Gravel Road Rehabilitation

- Spring is the best time for this as there is minimal vegetative growth and moisture is present

- The use of a roller for compaction will greatly improve the finished surface

- This will leave a denser, stronger, smoother surface that will be easier to maintain.

What is Good Gravel?



The answer to this question will vary depending on the region

Local sources of aggregate available and other factors

Some regions of the country do not have good sources of gravel

No gravel surface will perform like pavement! $ controls quality!

Reasons for testing

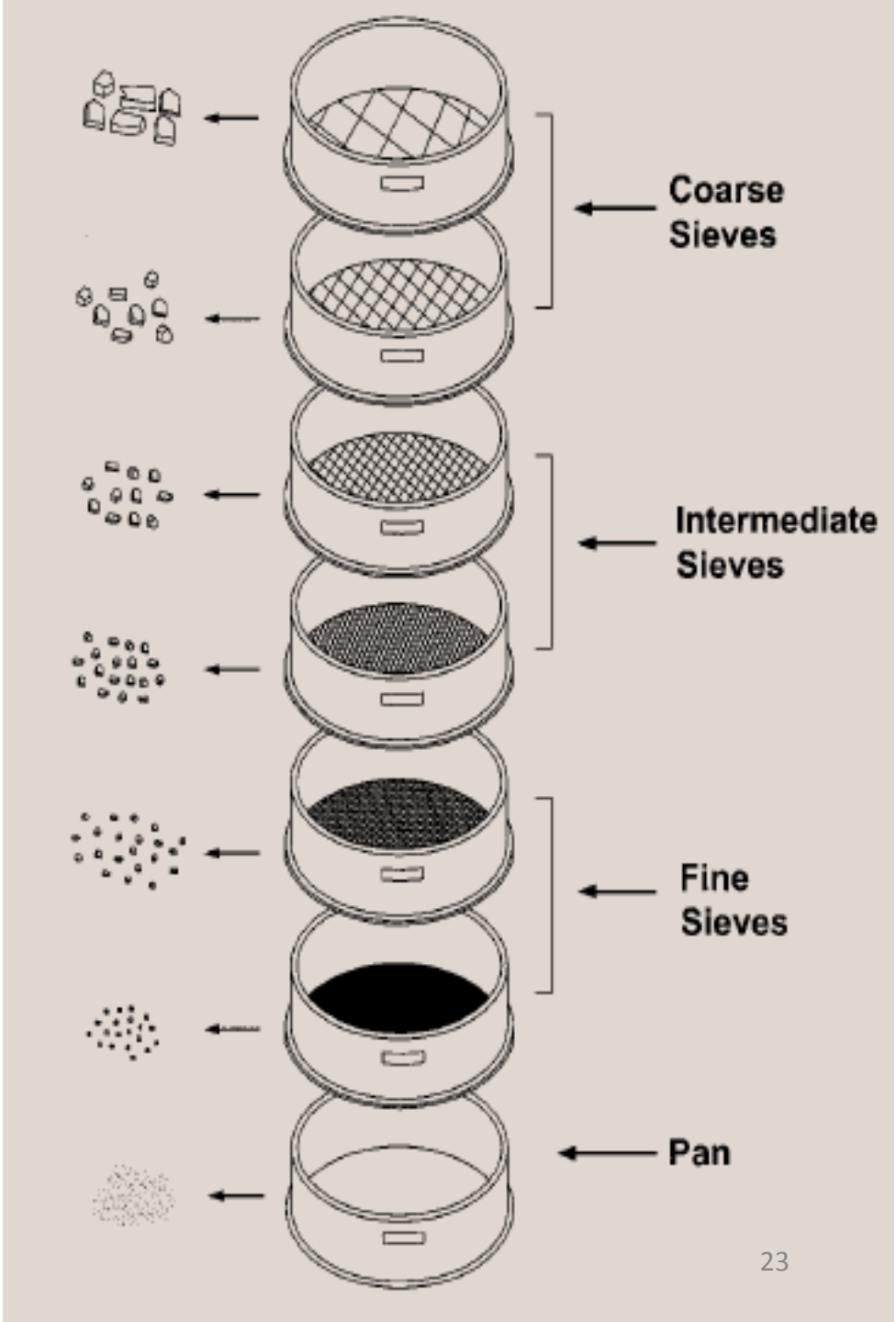
You get what you pay for!

I will sell you reject gravel

Single gradation test $135

Do not accept gradations from piles

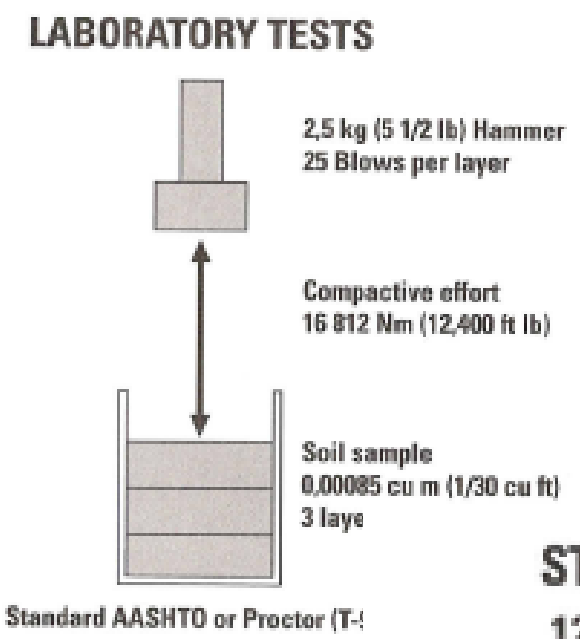
#4, #200



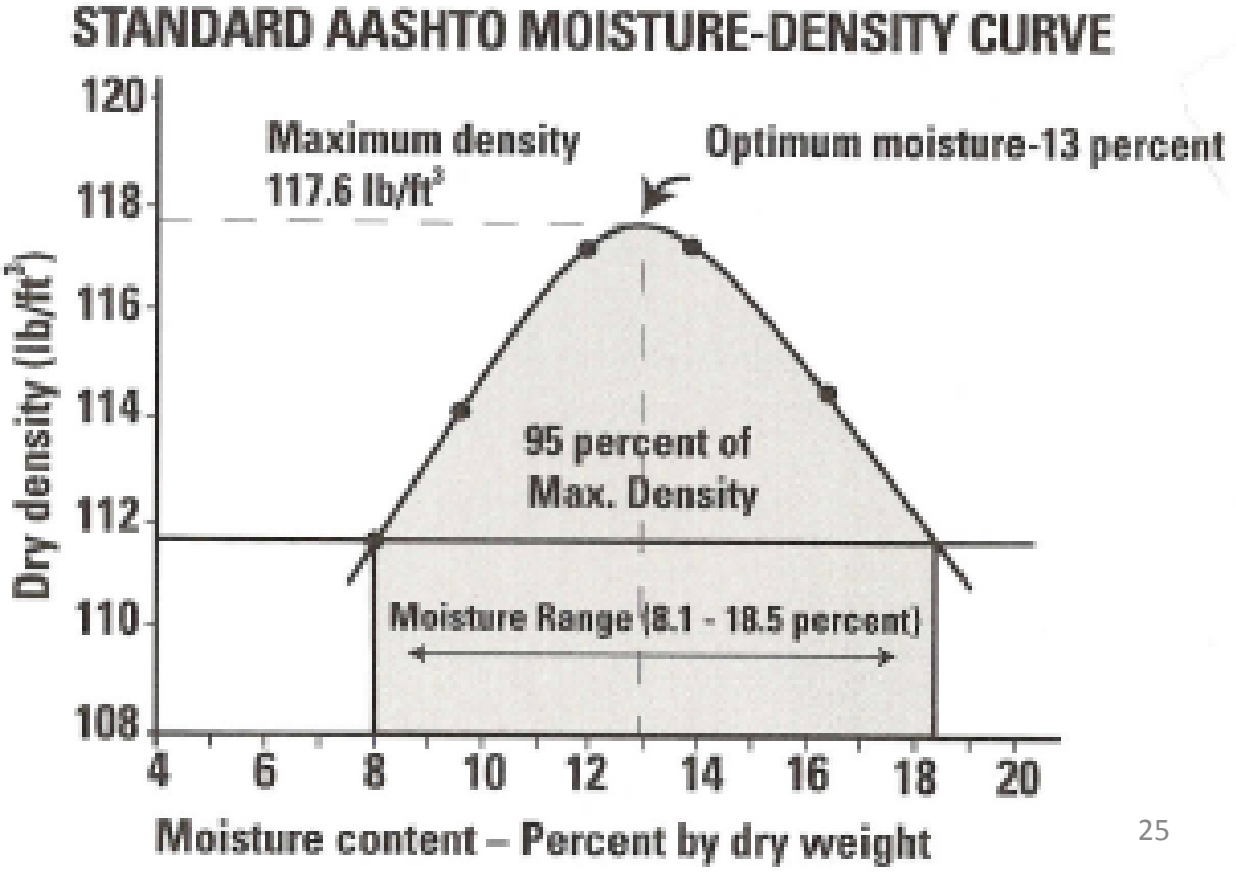
These two roads show remarkable contrast in surface condition due to the quality of gravel

The bottom photo shows a road surface that has too much stone and sand in proportion to the fine material

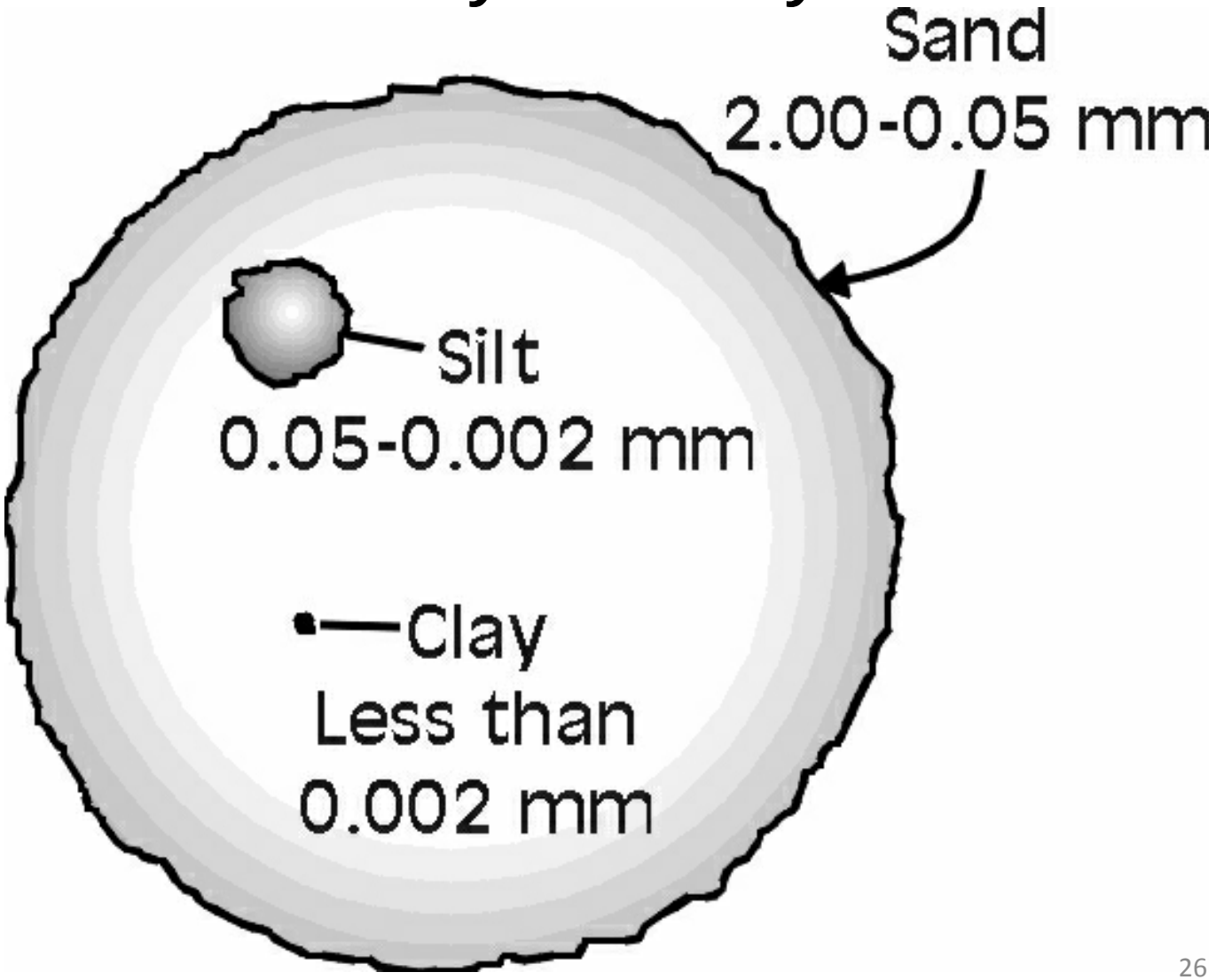
The gravel remains loose and is hard to maintain



5 point proctor



Silt and clay is #200
Silt = dusty or slimy



The use of a shouldering disk helps mulch up the sod and vegetation before it is pulled onto the roadway either to be removed or recycled on the road as reusable gravel


Apply what we learn!

Questions?

Contact Information:
Corey Uhrich
701-740-2308
CUhrich@clcmn.edu