How Do We Begin

- Usually a call from a Highway Superintendent or Township board
- Find a host site
- Inviting neighbors to attend (like to be less than 30 in classroom)
- Will do some hands-on training if time permits
- Find a partner to participate (machinery dealer generally)
- Partner is usually chosen by host county (provide coffee, lunch, rolls)
- Have and will do hands on but to single entity (less than 10 operators)
- Advertise if a dealer requests on behalf of an entity (Often hosts)

South Dakota LTAP
MOTOR GRADER OPERATOR TRAINING PROGRAM

- Motor Grader Training Knowledge
  1. Proper Roadway Crown on a straight flat section should be:
     A) 0%
     B) 2%
     C) 4%
     D) 6%
  2. Proper crown on a rail crossing should be:
     A) 0%
     B) 2%
     C) 4%
     D) 6%
  3. Corrugation is commonly caused by:
     A) Poor quality gravel
     B) Traffic tendencies
     C) Weather
     D) Crown
     E) All of the above
  4. Roadway shape should look like:
     A)
     B)
     C)
     D)
  5. Draw what you picture as a typical section of roadway from fence line to fence line:

- Teaching Principals
  - Safety
  - Machine know how
  - Principals of maintenance
  - Cutting edges
  - Retrievers
  - Pulling shoulders (Roadway reshape)
  - Soft spot repair
  - Regraveling

Appropriate pitch for performing gravel maintenance:
1) Figuring roadway crown on a 20' tap: Formula is the road width
   \( \frac{1}{2} \) X width X 4%
   A) 2.0
   B) 4.8"
   C) 3.6"
   D) 1.0"
2) How much gravel is acceptable on a bridge deck:
   A) 2"
   B) 1"
   C) 0"
   D) Enough to match the roadway
3) When reshaping the roadway, the hinge point should be moved:
   A) Better drainage
   B) Adjust road width
   C) A time place to place the windrow
   D) All of the above
4) High shoulders contribute to:
   A) Poor cross section
   B) Poor drainage
   C) Safety concerns
   D) All of the above

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Safety

- Strobe light or beacon is on at all times
- Direction of blade for highway travel
- Proper signage to warn the public
- Proper signage to warn the public
- Safety clothing when outside the machine
- Texting and cell phone policies
- Drug and alcohol policy and testing

Machine Know How

- Understanding blade functions
- Angle of the moldboard
- Articulation
- Wheel lean
- Side shift
- Circle shift
- Moldboard pitch
- Tandem lock
- General knowledge of cab awareness and features

Maintaining Gravel Roads

Important things to understand about the use of the motorgrader:

- Moldboard Angle
- Moldboard Pitch
- Motorgrader Stability
- Operating Speed
- Articulation
- Windrows
Principals of Maintenance

- Three pass blading (if required)
- Understanding roadway cross section and crown
- Hinge point
- In-slope
- Back slope
- Knowledge of material
- Compaction and use of water for construction or maintenance

Cutting Edges

- Type of cutting edges available
- What are you currently using and why
- Importance of a straight cutting edge
- Carbide tips or carbide serrated
- Standard cutting edges vs carbides
- Where each style of blade is useful
- Also discuss the use of scarifier or rippers

Maintaining Gravel Roads

- Understanding correct shape of the roadway cross-section is the most important knowledge an operator can possess.
- Gravel roads constantly change shape!!! Operators and supervisors have to deal with this.
Retrievers
- Styles and options for retrievers
- What you use and if it works for you
- Time of year for best results
- Our goals for retrieving
  - Recover lost gravel and fines
  - Narrow the roadway
  - Break up sod before pulling shoulders

Pulling Shoulders
- Preparing to pull shoulders
- Location of machine on the roadway
- Time of year
- Changing the hinge point
- Reshape prior to re-gravel operations
- Drainage issues
- Recover lost material

Maintaining Gravel Roads
- Many gravel roads often need a major reshape at certain intervals in their life cycles to restore crown in the surface, a good shoulder line and shape of ditches

Other attachments can be helpful.
Soft Spot Repair

- Identifying the problem
- Best practices
- Fabric installation
- Use of proper material (both fabric and granular)
- Proper means of covering fabric (placement of base)
- Dig outs or healing out of material
- Restoring proper drainage

Re-Graveling

- Use of proper material (usually not the operator’s decision)
- Reshape of the roadway prior to graveling
- Water and loosening of material prior
- Windrowing new material
- Healing and equalizing
- Splitting and laying new material
- Compaction if that is an option

Heel and equalize material into an even windrow
Special Situations

- Driveways
- Intersections
- Approaches
- Rail Crossings
- Bridge Decks
- Proper Crown for each of the above
- Safety practices for dealing with these

Thank You

GREG VAVRA (SD LTAP)