

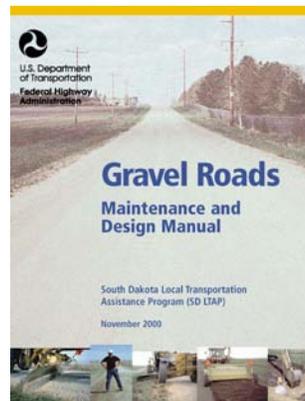
# Instructor's Guide for Using the Gravel Road Maintenance DVD

## Introduction

This document is written as an Instructor's Guide and is part of a training toolkit for teaching Gravel Road Maintenance. There are two other resources that are part of this toolkit:

- The *Gravel Road Maintenance: Meeting the Challenge* DVD. This DVD can either be used as a stand-alone tutorial (click Play All as shown on the screen at top right) or as an instructor's tool to introduce the topics of gravel road maintenance. Each chapter of the DVD discusses a specific maintenance topic. After playing a chapter, the instructor can pause the DVD and use other materials to teach the class.
- The Federal Highway Administration's *Gravel Roads Maintenance and Design Manual*. This manual is a very comprehensive guide on the design and maintenance of gravel roads.

The Instructor's Guide provides a brief overview of how to use these resources.



## Objectives

The primary objective of this toolkit is to show maintenance workers, supervisors, and engineers the right way to perform gravel road maintenance. The secondary objective is to show the public what can be done, what is being done, and why it needs to be done.

The DVD will be used primarily to introduce topics in live training sessions for road maintenance workers. It will be the responsibility of the trainer to explain the details of how to accomplish the various tasks.

## Strategy

People adopt behaviors only when they believe that they are in their best interest and/or in the best interest of their family, friends, and neighbors. Therefore, this toolkit demonstrates the importance of gravel roads to every community—in part by stating that gravel roads comprise more than 50 percent of all U.S. roads. This leads to the point that workers are making an important contribution to the safety, comfort, and convenience of their community by doing a good job maintaining gravel roads. The toolkit also emphasizes that gravel road maintenance is to a great extent an art that maintenance workers must work to develop. Ultimately, these ideas lead to the conclusion that workers take pride in their work on gravel roads.

## Intended Audiences

There are three audiences that the toolkit is intended for:

- Primary – road maintenance workers, including operators of motor graders.
- Secondary – road maintenance supervisors and engineers
- Tertiary – members of the general public

## Outline of DVD Chapters

The corresponding pages from the FHWA manual are provided for each main bullet.

### Introduction

- General Introduction

### Correct Roadway Shape

- Parts of roadway, such as the driving surface, shoulders, foreslope, ditch, and backslope (*page 1*)
- Crown/cross slope (*pages 9 to 11 and 22 to 28*)
  - Goal is four percent.
  - Effects where vehicles drive
    - Too steep (all vehicles down the center)
    - Sharp drop-off at edges (vehicles will crowd center)
  - Need to adjust at railroad tracks, bridges, intersections, and curves.
- Avoid high shoulders (*pages 13 to 14*).

### Shaping the Roadway

- Perform a safety/equipment check of the motor grader (*Appendix E*).
- Maintain a motor grader running speed of three to five miles per hour (*page 4*).
- Reshaping involves restoring crown and recovering material (*pages 4 to 8*).
- Orientation of mold board is critical (*pages 4 to 6*).
  - Adjust angle to between 30° to 45°.
    - Too little and material will spill from the toe.
    - Too much and the material will not blend.
  - Adjust the pitch (or tilt).
    - If back too far, the material will build up.
    - If too far forward, the material will roll/blend and will not blade cut.

- Use motor grader articulation to improve stability (*page 7*).
- Use wheel tilt to compensate for motor grader drift (*page 7*).
- While reshaping remove potholes, ruts, and washboarding (*pages 20 to 22*).
  - Causes of washboarding include vehicles, poor aggregate, lack of moisture, and running motor grader too fast.
- Shouldering disk is an alternative way of retrieving gravel from shoulder/ditch (*page 60*).
- Compact gravel after reshaping (*page 61*).
- Gravel roads should be routinely maintained, such as light trimming and removing defects, in the summer and fall (*pages 18 to 19*).

### Good Surface Gravel

- Agency should adopt a surface gravel specification (*pages 43 to 44, Appendix B*).
- Base gravel does not make good surface gravel (*page 39*).
- Surface gravel (*pages 39 to 43*)
  - Proper gradation
  - Maximum size of 3/4-inch
  - Eight to 15 percent fines
  - Enough clay in fine for good plasticity
- Needs to be crushed and not pit run (*page 40*).
- When blading adjust moisture content for good compaction (*page 61*).

### Dust Control

- Four reasons to consider dust control (*page 52*):
  - Increase safety.
  - Saves money (minimize fines from blowing away).
  - Keeps residents happy.
  - Reduces routine maintenance.
- Several chemical options: most agencies use either magnesium and calcium chloride (*page 51*).
- Works best with good surface gravel and four percent crown (*page 53*).

## Additional Resources

- Co-workers with skill and experience
- Local Technical Assistance Program (LTAP) Centers
- FHWA Manual: *Gravel Roads: Maintenance and Design Manual*
- U.S. Forest Service videos on gravel road maintenance
- Equipment manufacturers
- National Association of County Engineers (NACE) and American Public Works Association (APWA)
- Department of Transportation specifications