

# Low Volume Road Surface Selection Tool

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# Presentation Outline

- Purpose and Need for Tool
- Existing South Dakota Tool
- Objectives for enhancements to SD Tool
- Overview of newly developed SST
- Deployment Plans
- Questions

# Purpose and Need for Tool

- Should I turn this paved (kind of) road back to gravel?
- Should we pave this gravel road?
- Should we do dust control?

# Purpose and Need for Tool

“When you gonna pave this damn dusty gravel road?”



Becker County  
- 450 miles Paved  
- 250 miles gravel

# Purpose and Need for Tool

- The answer usually involved something like...We just don't have enough \$ for that or some rule of thumb.
- Instead we should be analyzing and reporting total life cycle costs of available options considering...
  - Various levels of traffic
  - Several surface type options
  - Initial construction and all maintenance costs
  - Agency and optional user costs

# Existing South Dakota Tool

- This type of analysis is typically not done
- South Dakota tool developed to assist Counties in developing this type of detailed cost analysis
  - Spreadsheet tool for download
  - Default values with ability to change
  - Reporting of total life cycle costs with 4 treatments

# Existing South Dakota Tool

## SDDOT Local Roads Surfacing Criteria Decision Tool

### Introduction

This analytical tool applies the low-volume road management methodologies recommended under the project titled Local Road Surfacing Criteria (SD2002-10). The objective of this study is to develop a methodology that allows the user to compare the costs associated with different road surfaces. Specifically, this spreadsheet tool is used to determine the costs associated with maintaining roads with different surfaces and selecting the most appropriate road surface for a specific set of circumstances.

To start your analysis session, fill in the general project description information below and click on the "Next" button. Continue progressing through the analysis setup steps by clicking the "Next" buttons in subsequent dialog boxes. To enable additional inputs for advanced users, click on the "Enable Advanced Inputs" check box below.

#### Project Description Information

Road name:

Location:

County:

#### Advanced User Inputs

The analysis is based on a number of default values. While the typical user should not change these default values, if you wish to use these more complex cost-related inputs

☒ Enable "Advanced User" Inputs

#### Development Information

##### Prepared for:



South Dakota  
Department of  
Transportation

##### Developed by:



Applied Pavement  
115 W. Main St., S  
Urbana, Illinois 618  
(217) 398-3977  
www.appliedpaver.com

Next

## SDDOT Local Roads Surfacing Criteria Decision Tool

### Agency Cost Details

Use the following controls to define the cost details associated with each surface type you have chosen to include. Note that a separate tab is displayed for each surface type you have chosen to include in the analysis.

HMA | Blotter | Gravel

Use these controls to define specific maintenance-related costs associated with HMA surface treatments.

Cost of initial HMA construction (or last major rehabilitation):  per mile

#### Maintenance Treatment Timing and Cost Details

Maintenance Treatments	Treatment Application Timing/Frequency				Unit Treatment Cost (\$/project application, \$/mile, or \$/square foot)
<input checked="" type="checkbox"/> Crack Sealing	Applied	<input type="text" value="1"/> time(s)/yr	<input type="text" value="every 5 years"/>	starting in yr <input type="text" value="3"/>	<input type="text" value="\$1,200"/> /mile
<input checked="" type="checkbox"/> Seal Coat	Applied	<input type="text" value="1"/> time(s)/yr	<input type="text" value="every 6 years"/>	starting in yr <input type="text" value="3"/>	<input type="text" value="\$15,000"/> /mile
<input checked="" type="checkbox"/> Overlay (thickness: <input type="text" value="2"/> in.)	Applied	<input type="text" value="1"/> time(s)/yr	<input type="text" value="every 20 years"/>	starting in yr <input type="text" value="21"/>	<input type="text" value="\$96,450"/> /mile
<input checked="" type="checkbox"/> Striping and Marking	Applied	<input type="text" value="1"/> time(s)/yr	<input type="text" value="every 6 years"/>	starting in yr <input type="text" value="3"/>	<input type="text" value="\$450"/> /mile
<input checked="" type="checkbox"/> Patching/Maintenance	Applied	<input type="text" value="1"/> time(s)/yr	<input type="text" value="every year"/>	starting in yr <input type="text" value="10"/>	<input type="text" value="\$800"/> /mile
<input type="checkbox"/> Other	Applied	<input type="text" value="1"/> time(s)/yr	<input type="text" value="every year"/>	starting in yr <input type="text" value="1"/>	<input type="text" value="\$0"/> /mile

Apply Default "HMA" Strategy

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Advanced Inputs

?

# Objectives for enhancing SD Tool

- Update the hard coded default values
- Transform to a Web-based tool
- Consider additional surface types
- Add options to improve initial construction costs
- Add capability for storing County and Regional values
- Allow Counties to create a save default values
- Update user cost methods

# Overview of ND/SD SST

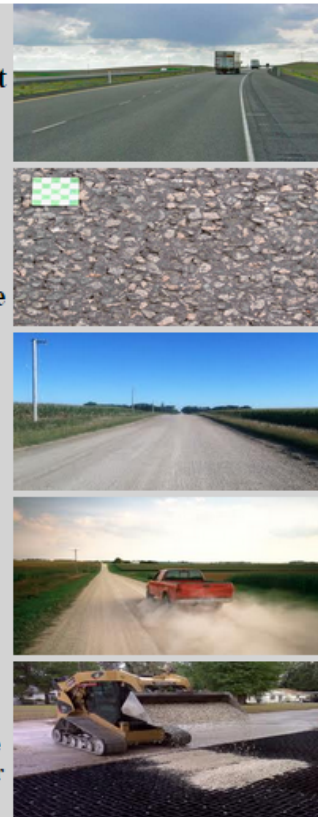
## Local Road Surface Selection Tool

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This analytical tool applies the low-volume road management methodologies recommended under the project titled “Local Road Surfacing Criteria (SD 2002-10)”. The objective of this study is to develop a methodology that allows the user to compare the costs associated with different road surfaces. Specifically, this tool is used to determine the costs associated with maintaining roads with different surfaces and selecting the most appropriate road surface for a specific set of circumstances. More information about this project and tool can be found by clicking “Software Introduction”.

Click “Start Analysis” to start a regular analysis.  
Click “Administrator Login” to log in if you are an administrator.  
Detailed user’s guide is available by clicking “User’s Guide”.

**DISCLAIMER:** Although the information generated by this model has been produced and processed from data that is believed to be reliable, the information generated by this model is for estimation uses only. The Upper Great Plains Transportation Institute and North Dakota State University make no representation or warranty, expressed or implied, regarding the accuracy or reliability of the model or results.



Start Analysis

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# Overview of ND/SD SST

## Local Road Surface Selection Tool

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**Please select your state and county:**

Select your state

North Dakota ▼

Select your county

Adams ▼

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# Overview of ND/SD SST

## Local Road Surface Selection Tool

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### General Setup

#### Selection of Default Setting Type

- ☒ Region-Level Default Base Year: 2014  
☐ County-Level Default Base Year: 2014

#### Selection of Surface Types

- ☒ Hot-Mix Asphalt (HMA)  
☒ Asphalt Surface Treatment (AST)  
☒ Gravel  
☒ Dust Control  
☒ Stabilized Gravel

#### Selection of Alternative Cost Items

- ☐ Include Salvage value  
☐ Include user costs

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# Overview of ND/SD SST

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### Common Parameters Setup

Project Length	<input type="text" value="5"/>	miles	Project Width	<input type="text" value="24"/>	feet
Average Daily Traffic (ADT)	<input type="text" value="100-199"/>	vehicles/day	Analysis Period	<input type="text" value="20"/>	years
Discount Rate	<input type="text" value="3.5"/>	%	Start Year of Analysis	<input type="text" value="2015"/>	
<input type="button" value="Reset"/>					

# Overview of ND/SD SST

## Agency Cost Parameters Setup

HMA

AST

Gravel

Dust Control

Stabilized Gravel

HMA

INITIAL COST

Total Initial Cost (\$/mile): \$ 725,115

Initial Costs Calculator

Treatment Selection	Treatment Name	Application Times Per Year	Year Interval Between Applications	Application Start Year	Unit Cost (dollars)	Unit Selection
<input checked="" type="checkbox"/>	Crack Sealing	1	4	6	10000	per mile ▼
<input checked="" type="checkbox"/>	Seal Coat	1	7	3	20000	per mile ▼
<input checked="" type="checkbox"/>	Thin Lift OverLay	1	20	20	250000	per mile ▼
<input checked="" type="checkbox"/>	Striping and Marking	1	3	3	2000	per mile ▼
<input checked="" type="checkbox"/>	Patching/Maintenance	1	3	3	3000	per mile ▼
<input type="checkbox"/>	Other	1	1	1	0	per mile ▼

Reset

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View Analysis Summary

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# Overview of ND/SD SST

## Local Road Surface Selection Tool

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### HMA Initial Cost Parameters Setup

PARAMETER	VALUE	UNIT	PARAMETER	VALUE	UNIT
HMA Thickness (new)	4	inches	Reshaping / Sub-grade Prep	200000	\$/Mile
HMA Cost (placed)	120	\$/Ton	Reclaiming / Milling (if asphalt)	0	\$/Sqyd
Base Thickness (New)	4	inches	Widening (if necessary)	0	\$/Mile
Base Gravel Cost (placed)	26	\$/Ton	Pavement Marking	2000	\$/Mile
			Engineering / Contingencies	20	% of total

**Total Initial Cost (\$/mile)** \$ 725,115

# Overview of ND/SD SST

## Agency Cost Parameters Setup

HMAASTGravelDust ControlStabilized Gravel

Dust Control

INITIAL COST

Total Initial Cost (\$/mile): \$ 286,182Initial Costs Calculator

Treatment Selection	Treatment Name	MAINTENANCE COST Application Times per year	Year Interval Between Applications	Application Start Year	Unit Cost (dollars)	Unit Selection
<input checked="" type="checkbox"/>	Blading	10	1	1	200	per mile ▼
<input checked="" type="checkbox"/>	Regravel	1	3	3	20000	per mile ▼
<input checked="" type="checkbox"/>	Reshape Cross Section	1	1	1	2000	per mile ▼
<input checked="" type="checkbox"/>	Reapply Dust Control	1	1	1	8000	per mile ▼
<input type="checkbox"/>	Other	1	1	1	0	per mile ▼

Reset

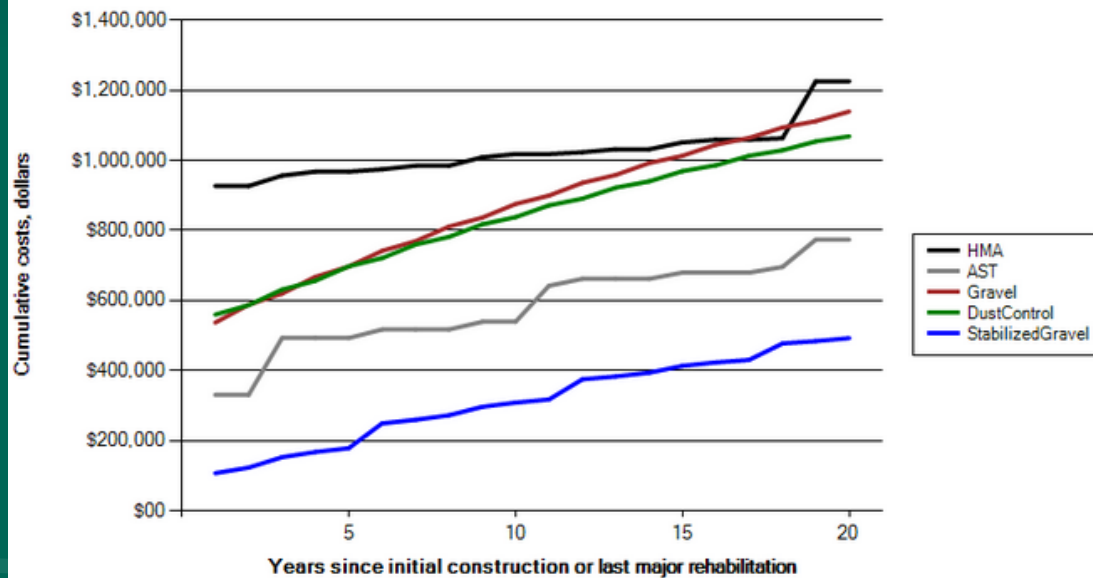
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# Overview of ND/SD SST

**Agency Cost Short Summary - Per Mile**

Surface Type	HMA	AST	Gravel	Dust Control	Stabilized Gravel
Total Initial Cost	\$ 927,149	\$ 330,455	\$ 506,773	\$ 531,773	\$ 94,182
Total Maintenance Cost	\$ 299,164	\$ 443,442	\$ 633,314	\$ 537,404	\$ 398,303
Total Salvage Value	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
<b>Total Agency Cost</b>	<b>\$ 1,226,313</b>	<b>\$ 773,897</b>	<b>\$ 1,140,087</b>	<b>\$ 1,069,177</b>	<b>\$ 492,485</b>

**Comparison of Cumulative Costs Associated with Different Surface Types**



# Overview of ND/SD SST

## - Administration – Region and County

### State Administration

You are Welcome, state administrator of North Dakota!

#### Functionality

- Region Management
- Update Initial Cost Default Values
- Update maintenance Cost Default Values
- County Administrator Account Management
- Reset Personal Password
- Communication

Log Out

### Maintenance Costs Default Values Up

Select region you want to update **East Area**

HMA **AST** Gravel Dust Control Stabilized Gravel

Select a treatment Seal Coat

HMA: Seal Coat

ADT Level [vehicles/day]	Times per Year (County AVG)	Year Interval (County AVG)	App Start Year in order (County AVG)	Unit Cost (County AVG) [\$/mile]
0-99	1 (1)	7 (3)	3 (3)	1000 (1000)
100-199	1 (1)	7 (3)	3 (3)	1000 (1000)
200-299	1 (1)	7 (3)	3 (3)	1000 (1000)
300-399	1 (1)	7 (3)	3 (3)	1000 (1000)
400-499	1 (1)	7 (3)	3 (3)	1000 (1000)
500-599	1 (1)	7 (3)	3 (3)	1000 (1000)
>= 600	1 (1)	7 (3)	3 (3)	1000 (1000)

Set To County Average

Restore Region Default

Save All Changes To Database

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# Deployment Plans

- Finish any missing items such as..
  - User Costs
  - Help links
  - Any bugs identified in testing
- Meet with LTAP Directors and complete Region Defaults
- Create County contact email list and send out link
- Complete Tool and put link on UGPTI website by end of year

# Local Road Surface Selection Tool

October 21, 2015

## Questions?

[Demonstration](#)

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