

# Surface Selection Tool

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**NDSU**

UPPER GREAT PLAINS TRANSPORTATION INSTITUTE  
NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM

33<sup>rd</sup> Annual North Central Local Roads Conference  
Rapid City, SD - October 17-18, 2018



# Program Background

- Developed in 2015-2016
- Final Report 2017
- Web-based economic model for pavement and gravel

<http://dotsc.ugpti.ndsu.nodak.edu/SurfaceSelection/Default>

# Existing Data



- North Dakota
  - Regional Level
    - 3 Regions
  - Some County Level
- South Dakota
  - In Progress
- Minnesota
  - In Progress

# Steps for Analysis

1. Gather General Data
2. Identify Road Section
3. Select Surface Types to Analyze
4. Identify Common Parameters
5. Update Specific Roadway Costs
6. Analyze!

# Analysis

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## Local Road Surface Selection Tool

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**Please select your state and county:**

Select your state

- Minnesota
- Minnesota
- North Dakota
- South Dakota

Select your county

- Aitkin

**Next**

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## General Setup

### Selection of Default Setting Type

- Region-Level** Default Base Year: 2017  
 **County-Level** Select county is not updated.

### 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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### 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="300-399"/>	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="2018"/>	
<input type="button" value="Reset"/>					

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## Agency Cost Parameters Setup

HMA   AST   Gravel   Dust Control   Stabilized Gravel

**HMA**

**INITIAL COST**

Total Initial Cost (\$/mile): \$ 372,615   **Initial Cost Calculator**

Treatment Selection	Treatment Name	MAINTENANCE COST		Application Start Year	Unit Cost (dollars)	Unit Selection
		Application Times Per Year	Year Interval Between Applications			
<input checked="" type="checkbox"/>	Crack Sealing	1	7	4	4000	per mile ▼
<input checked="" type="checkbox"/>	Seal Coat	1	7	3	40000	per mile ▼
<input checked="" type="checkbox"/>	Thin Lift OverLay	1	20	21	200000	per mile ▼
<input checked="" type="checkbox"/>	Striping and Marking	1	1	2	1500	per mile ▼
<input checked="" type="checkbox"/>	Patching/Maintenance	1	5	9	6000	per mile ▼
<input type="checkbox"/>	Other	1	1	1	0	per mile ▼

**Reset**

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# Analysis

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### HMA Initial Cost Parameters Setup

PARAMETER	VALUE	UNIT	PARAMETER	VALUE	UNIT
HMA Thickness (new)	4	inches	Reshaping / Sub-grade Prep	15000	\$/Mile
HMA Cost (placed)	60	\$/Ton	Reclaiming / Milling (if asphalt)	2.5	\$/Sqyd
Base Thickness (New)	6	inches	Widening (if necessary)	0	\$/Mile
Base Gravel Cost (placed)	26	\$/Ton	Pavement Marking	1500	\$/Mile
			Engineering / Contingencies	15	% of total

**Total Initial Cost (\$/mile)** \$ 372,615

# Output

- Outputs cost summary and line chart summing costs over analysis period
- Can create PDF report of analysis information and outputs

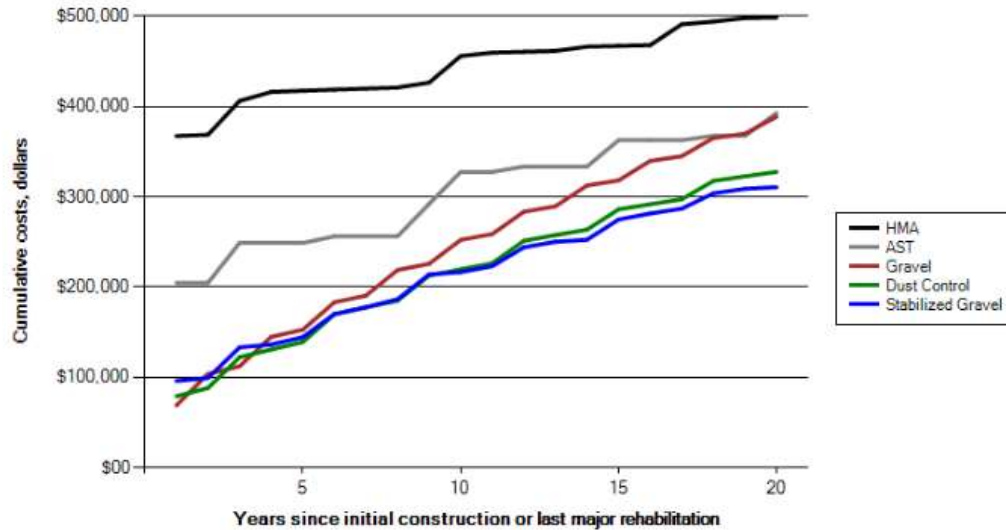
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## Agency Cost Short Summary - Per Mile

Surface Type	HMA	AST	Gravel	Dust Control	Stabilized Gravel
Total Initial Cost	\$ 372,615	\$ 204,564	\$ 63,386	\$ 69,386	\$ 89,386
Total Maintenance Cost	\$ 126,200	\$ 188,099	\$ 325,348	\$ 258,175	\$ 221,219
Total Salvage Value	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
<b>Total Agency Cost</b>	<b>\$ 498,815</b>	<b>\$ 392,663</b>	<b>\$ 388,734</b>	<b>\$ 327,561</b>	<b>\$ 310,605</b>

Comparison of Cumulative Costs Associated with Different Surface Types



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# Data Updates

- Data can be updated by County Managers
- Can update Regional data based on inputs of Counties within regions

# Other State Usage

- Other states and entities are free to use the program
  - Choose a similar county for baseline data
  - Update as necessary
    - Will not save data on single analysis

# Questions?

- There will be a webinar on this subject
  - December 19 10 AM - 11:30 AM CST

# Contact Information

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# TRB Low Volume Roads

**12<sup>th</sup> TRB International Conference  
on Low Volume Roads**

**Kalispell, Montana  
September 15 – 18, 2019**

More information at  
[www.ucprc.ucdavis.edu/LVR2019](http://www.ucprc.ucdavis.edu/LVR2019)

