

Gravel Survey Webinar

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Associate Research Fellow

Study of County, Tribal and Township Road and Bridge Needs

- Directed by the North Dakota Legislature
- Estimate road and bridge needs over the next 20 years
- Study results used in distribution of funding under Operation Prairie Dog
- Information for policymakers on road conditions and funding needs to maintain the existing road and bridge system
- Data collected as part of the study is publicly available to all jurisdictions and the public
 - Traffic counts
 - Pavement condition
 - Survey responses

Study Team

- Denver Tolliver
- Alan Dybing
- Kelly Bengston
- Tim Horner
- Dale Heglund
- Brad Wentz
- Satpal Wadhwa

Importance of Unpaved Road Modeling

- Unpaved roads are approximately 92% of the County, Tribal and Township road mileage
- Unpaved roads are responsible for 65% of the total needs

Table E: Summary of All Road and Bridge Investment and Maintenance Needs for Counties, Townships and Tribes in North Dakota (Millions of 2020 Dollars)

Period	Unpaved	Paved	Bridges	Total
2021-22	\$ 611.08	\$ 388.46	\$ 94.39	\$ 1,093.93
2023-24	\$ 602.19	\$ 406.97	\$ 94.40	\$ 1,103.56
2025-26	\$ 616.21	\$ 304.56	\$ 94.74	\$ 1,015.51
2027-28	\$ 615.89	\$ 264.53	\$ 94.63	\$ 975.05
2029-30	\$ 602.76	\$ 222.20	\$ 94.48	\$ 919.44
2031-40	\$ 3,087.97	\$ 1,081.77	\$ 26.17	\$ 4,195.91
2021-40	\$ 6,136.10	\$ 2,668.49	\$ 498.81	\$ 9,303.40

Data Collection Updates

- Traffic Counts
 - Volume
 - Classification Counts – additional locations for 2021
- Pavement Data Collection
 - Annual pavement data collection – $\frac{1}{2}$ of the state each year
 - Previous data was collected every 2 years
- Survey Enhancements
 - Steering committee of county road supervisors
 - Steering committee of township officers
 - Focus on improvement and maintenance methods

Steering Committee

- Ritch Gimbel – Bottineau
- Wayne Oien – Griggs
- Josh Loegering – LaMoure
- Darlene Carpenter - McHenry
- Jana Hennessy– Mountrail
- Devin Johnson - Pembina
- Jesse Sedler – Richland
- Tim Faber – Sargent
- Corwyn Martin - Traill
- Sharon Lipsh – Walsh
- Dana Larsen - Ward

Data Collection Timeline

- Bridge Method Survey – April 2021
- Traffic Data Collection – Summer 2021
 - 420 Counts, 350 classification – UGPTI
- Pavement Data Collection – Summer 2021
 - 2,600 miles – south ½ of the state
- Gravel Survey
 - Steering Committee (County) – June 2021
 - Steering Committee (Township) – October 18-22, 2021
 - Survey Webinar – October 26, 10:00 AM
 - Survey Mailing – November 1, second mailing December 1

Study Timeline

- Traffic Model Development - Ongoing
- Pavement Analysis (Spring 2022)
 - AASHTO-93 model of pavement deterioration and timing of improvements
 - Widening improvements
- Unpaved Analysis (Spring 2022)
 - Gravel road segments grouped by traffic categories
 - Annualized costs applied based upon traffic levels (and county/township practices)
- Bridge Analysis (Spring 2022)
 - Bridge Needs Target (replacing sufficiency rating)
 - Forecast deterioration and improvements

Study Process

- Travel Demand Model
 - Using agricultural and oil related data to forecast truck traffic over the next 20 years
 - Compared against observed traffic counts and adjusted
- Impacts to roadways are dependent on traffic levels
 - Paved
 - Pavement thickness
 - Maintenance
 - Unpaved
 - More frequent blading
 - More frequent and thicker gravel overlays
 - Dust suppressant and base stabilization

Study Process

- Unpaved Analysis
 - Assigning maintenance costs based upon traffic level forecasts
 - Survey of costs and practices
 - Group miles by traffic levels
 - Apply annualized costs to each traffic level and add up mileages across each jurisdiction

Gravel Survey

- Objectives
 - Current component and maintenance costs
 - Current maintenance practices
 - Explain differences in costs between counties and regions

County Survey

NDSU UPPER GREAT PLAINS
TRANSPORTATION INSTITUTE

2021 COUNTY ROAD NEEDS STUDY

County: _____

Contact: _____

Name

Phone

Email

Preparer: _____ Date Prepared: _____

Aggregate Description

To determine the type and quality of aggregate used in your county, please check all boxes that apply. For example, if your county uses crushed, specification base gravel – select gravel, crushed material and specifications.

- Gravel
- Scoria
- Pit Run
- Screened
- Crushed Material
- Specifications
 - Fractured Faces
 - PI
 - Other _____
- Tested
- Other _____

Placement Practices

When aggregate overlays are placed in your county, please select the all practices that are used to apply an aggregate overlay.

- Truck Drop and Blade
- Windrow/Equalize
- Water/Rolling/Compaction
- Reshaping
- Pulling in Shoulders
- Soft Spot Repair
- Other _____

Operational Tasks

In this section, please provide a percentage of tasks that are done using county resources versus the percentage of work done by a contractor. For example, if your county owns the pit and does all of the crushing using county labor, 100% would be entered into the first column, and 0% in the second column.

	Performed by:	
Task	County	Contractor
Crushing		
Hauling		
Placement		
Blading		
Dust Control		
Base Stabilization		

Gravel Road Costs

Please report costs for gravel for county roads in the table below. The table asks for unit costs for graveling, maintaining, and operating gravel roads. If you are quoting contractor prices, please circle “yes” in the right-hand column.

Gravel/Scoria Cost			
Average Gravel/Scoria Cost (crushing & royalties at the pit)		<input type="checkbox"/> Per cu. yard <input type="checkbox"/> Per Ton	Is this Contractor Price? (yes/no)
Average Trucking Cost from Gravel Origin		<input type="checkbox"/> Per loaded mile <input type="checkbox"/> Per cu. yard <input type="checkbox"/> Per Ton	Is this Contractor Price? (yes/no)
Average trucking distance for aggregate		<input type="checkbox"/> Miles one-way <input type="checkbox"/> Miles roundtrip	
Truck Payload		<input type="checkbox"/> Cu. Yards <input type="checkbox"/> Tons	
Placement Costs		Per Mile	Is this Contractor Price? (yes/no)
Blading Cost		Annual cost per mile	Is this Contractor Price? (yes/no)
Dust Suppressant Costs		Per mile	Is this Contractor Price? (yes/no)
Base Stabilization Cost		Per mile	Is this Contractor Price? (yes/no)

Gravel Practices

County Entry	Traffic Levels		
	Low	Medium	High
Daily Traffic (Total AADT)			
Average Regraveling Thickness (specify)			
Blading Frequency (# per year)			
Regraveling Frequency (years between regraveling)			
Dust Suppressant (yes/no)			
Base Stabilization (yes/no)			

Gravel Practices

- Dust Suppressant
 - Yes/No
 - Type
- Base Stabilization
 - Yes/No
 - Type
- Recycled Asphalt
 - Yes/No

Gravel Road Condition

This section asks for information regarding gravel road conditions and is broken into two separate categories: Federal Aid, and Non-Federal Aid. Please provide a rough estimate of the percentage of unpaved roads by condition for these two categories.

Condition	% Federal Aid Roads (CMC)	% Non-Federal Aid Roads (non-CMC)
Very Good		
Good		
Fair		
Poor		
Total	100%	100%

Gravel Materials Specifications

If available, please attach a sample specification and sample gradation, or state materials specification number. If materials used on CMC routes differ from non-CMC routes, please provide sample specifications and gradation by system type, if available.

Comments or Suggestions

- Open section to add anything that is not included in the survey or to let the researchers know about issues that your county is dealing with on their road systems.

Township Survey

- Abridged version of the County survey
- Costs
 - Individual Components
 - Overall
- Practices
 - Who performs the maintenance?
 - Blading
 - Regraveling

1. Cost Breakouts (If known)

Average Gravel/Scoria Cost (crushing & royalties)		<input type="checkbox"/> Per cu. yard <input type="checkbox"/> Per Ton
Average Trucking Cost from Gravel Origin		<input type="checkbox"/> Per loaded mile <input type="checkbox"/> Per cu. yard
Average Placement Costs		Per mile
Blading Cost		Annual cost per mile
Dust Suppressant Costs (If applicable)		Per mile

2. Total Cost (if cost breakouts are not known)

Total Cost	\$	<input type="checkbox"/> Per cu. yard <input type="checkbox"/> Per Ton <input type="checkbox"/> Annual cost per mile
Number of Miles Maintained		

Average Gravel/Scoria Overlay Thickness _____

Cu. Yard/mile

Inches

Tons/mile

Who performs road maintenance in your township?

Blading Frequency

County Maintained

Township Contracted

Township Staff

Please report blading and graveling frequency for gravel roads.

Blading Frequency

1 per week

1 per month

2 per month

other (please explain)

Graveling Frequency

Every year

Every 2-3 years

Every 3-4 years

5 or more years

other (please explain)

Aside from routine maintenance and improvements, what other challenges are facing roadway maintenance in your county? (flooding, high traffic generators etc.).

Comments or Suggestions

- Open section to add anything that is not included in the survey or to let the researchers know about issues that your township is dealing with on their road systems.

Summary

- Unpaved road needs often comprise 2/3 of the total statewide needs
- Survey responses are an integral input to the statewide needs study
- Reported costs and practices are used in conjunction with traffic forecasts to estimate gravel needs over the next 20 years
- Survey will be mailed November 1 with a requested submission date of November 19

Questions/Comments

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