

NDLTAP (North Dakota Local Technical Assistance Program)

Road Repairs, Blading Narrow Roads and Dust Control

Tuesday, December 7, 2021
North Dakota Township Officers Association
55th Annual Meeting – Bismarck, ND



Dale C. Heglund, PE/PLS, North Dakota LTAP Director
701-318-6893 – dale.heglund@ndsu.edu

NDSU

UPPER GREAT PLAINS
TRANSPORTATION INSTITUTE
NORTH DAKOTA LOCAL TECHNICAL ASSISTANCE PROGRAM



North Dakota Township
Officers Association

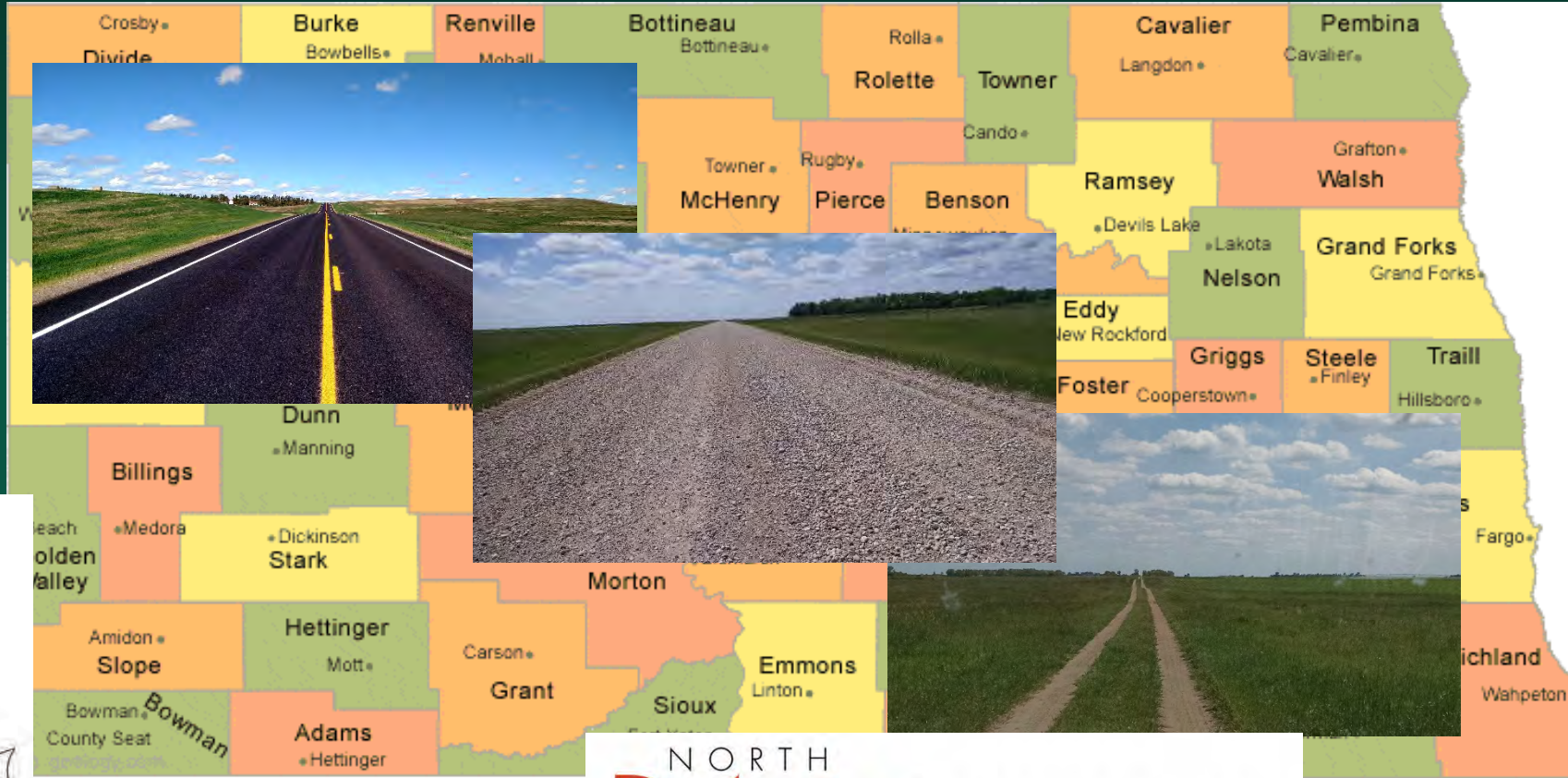
Greetings from the NDLTAP Team



53 counties

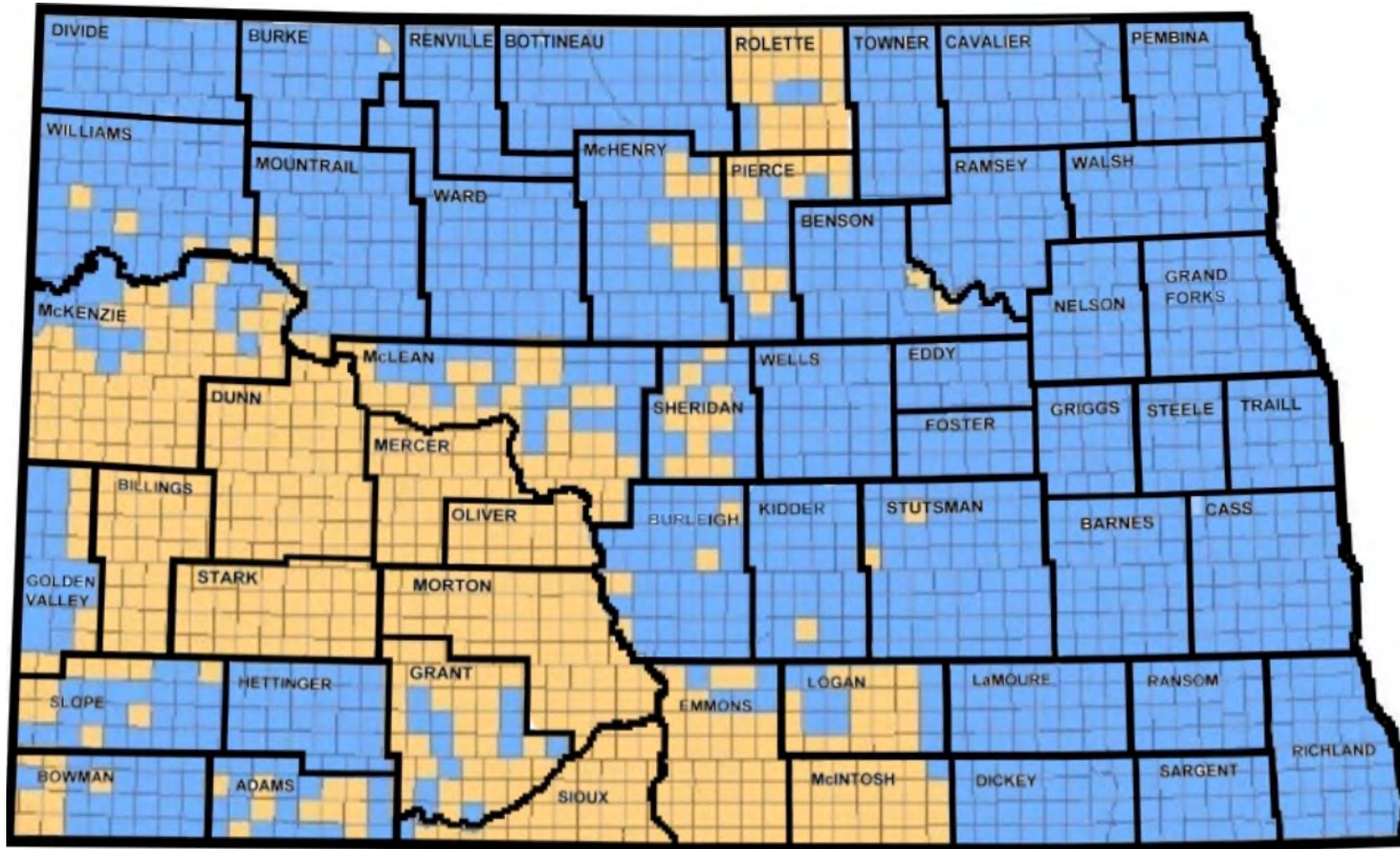
1,360 organized townships

357 communities



NORTH
Dakota | Transportation
Be Legendary.™





Organized Townships



Unorganized Townships

- Thank You!
- \$2,500 Support

Township Representative



Larry Syverson
North Dakota Township Officers Assoc., Exec. Sec.
Mayville, ND 58257
Phone: (701)786-2697 or (701)430-1735
larry@ndtoa.com



NDDOT Representatives



Bryon Fuchs, PE
NDDOT, Local Government Division
Bismarck, ND 58505-0700
Phone: (701)328-2516
blfuchs@nd.gov

NDIRF Representative



Mark Verke
ND Insurance Reserve Fund
P.O. Box 2258
Bismarck, ND 58502
Phone: (701)224-1988
mark.verke@ndirf.com

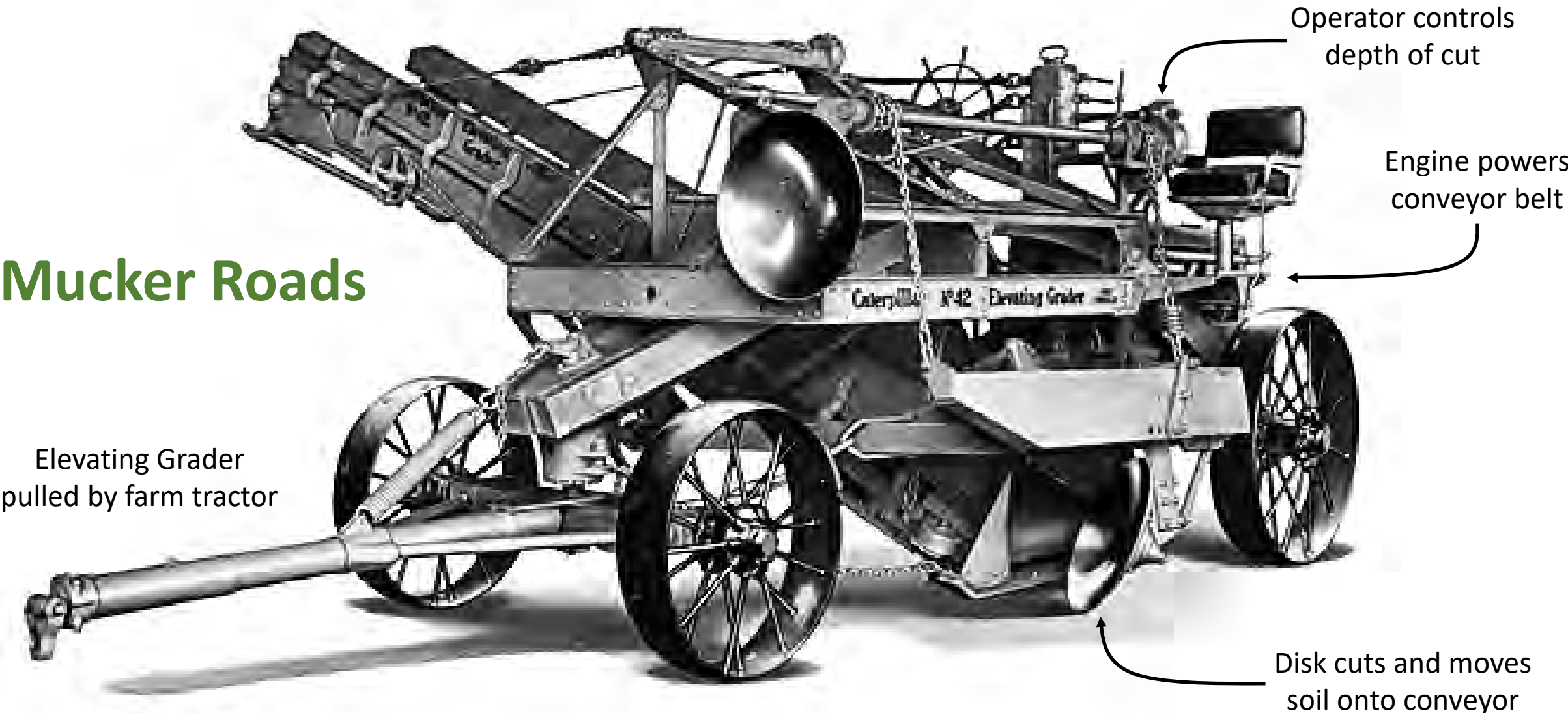
Soft Spot Repairs



A photo from the Athabasca County website illustrates a frost boil on one of the county roads. (Athabasca County website)

The Machine Used for Building “Elevator Roads”

Mucker Roads



No 42 elevating grader



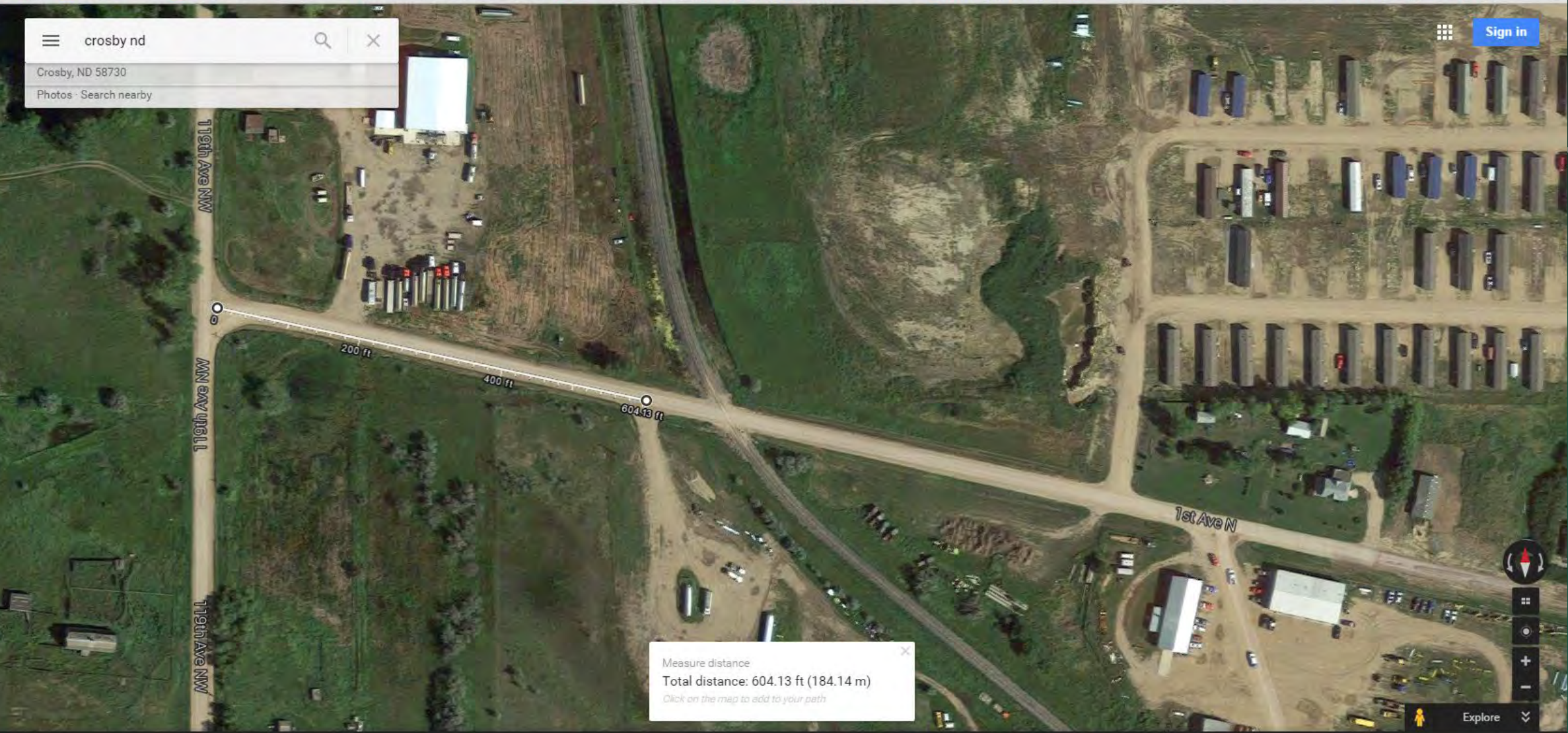




croby nd

Crosby, ND 58730

Photos · Search nearby



Measure distance

Total distance: 604.13 ft (184.14 m)

Click on the map to add to your path









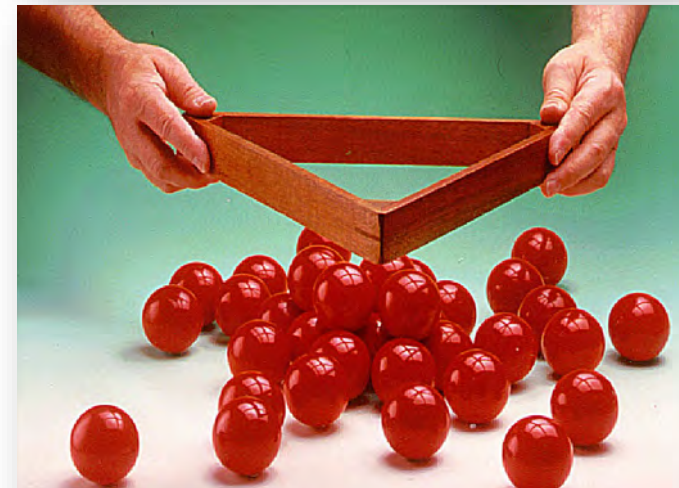
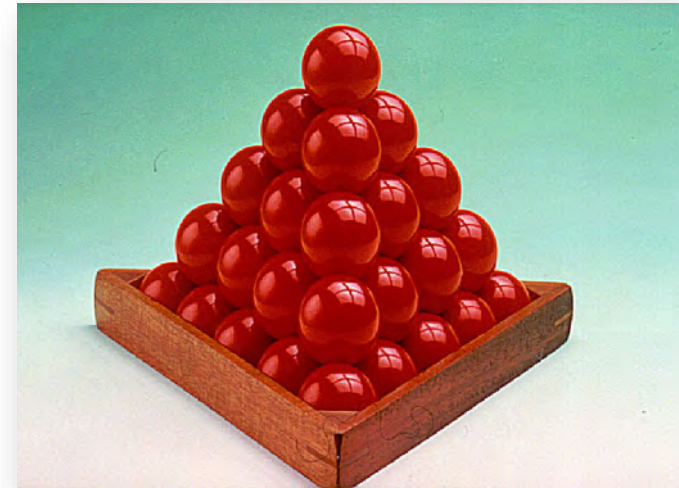
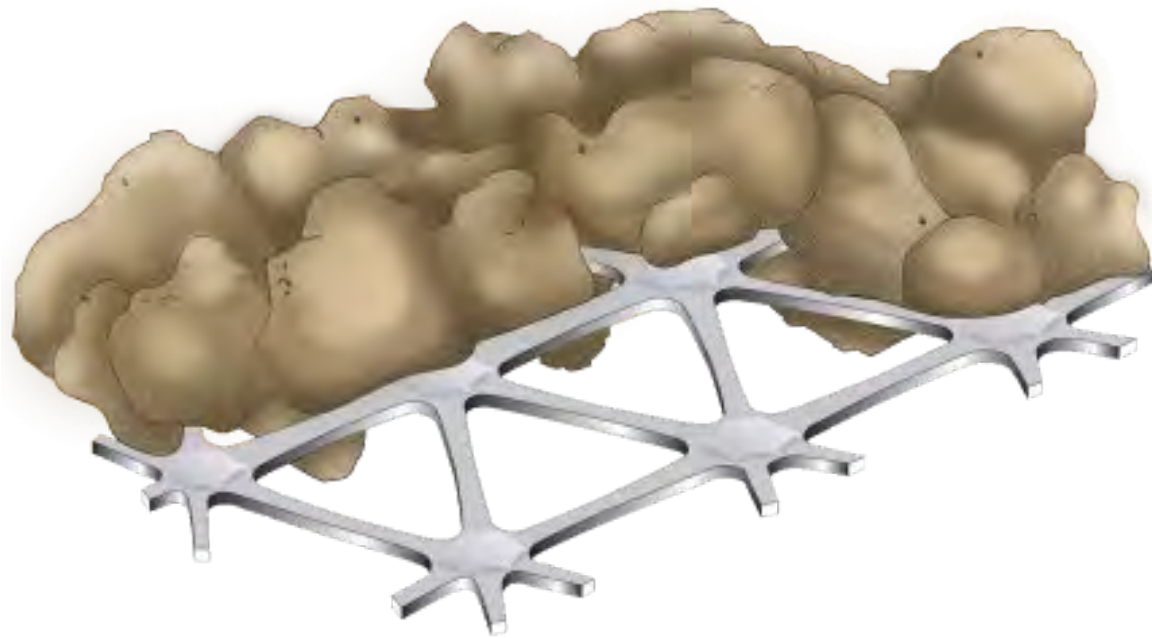


Subgrade Strength

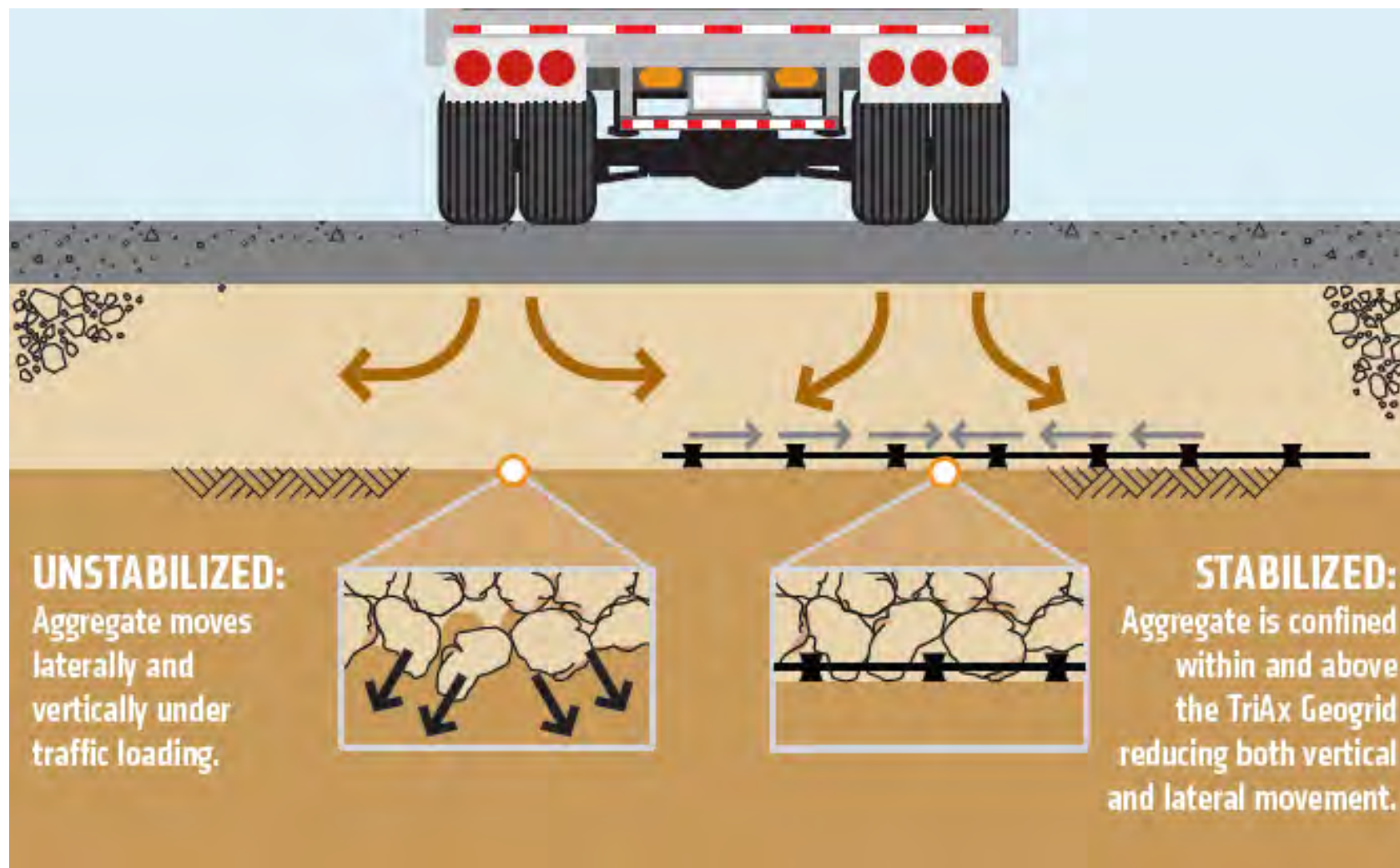




Lateral Confinement



Function and Performance Mechanisms Geogrids



“Geogrid improves the ability to obtain compaction in overlying aggregates”

Wheel Load



**Well Graded
Surface Material**

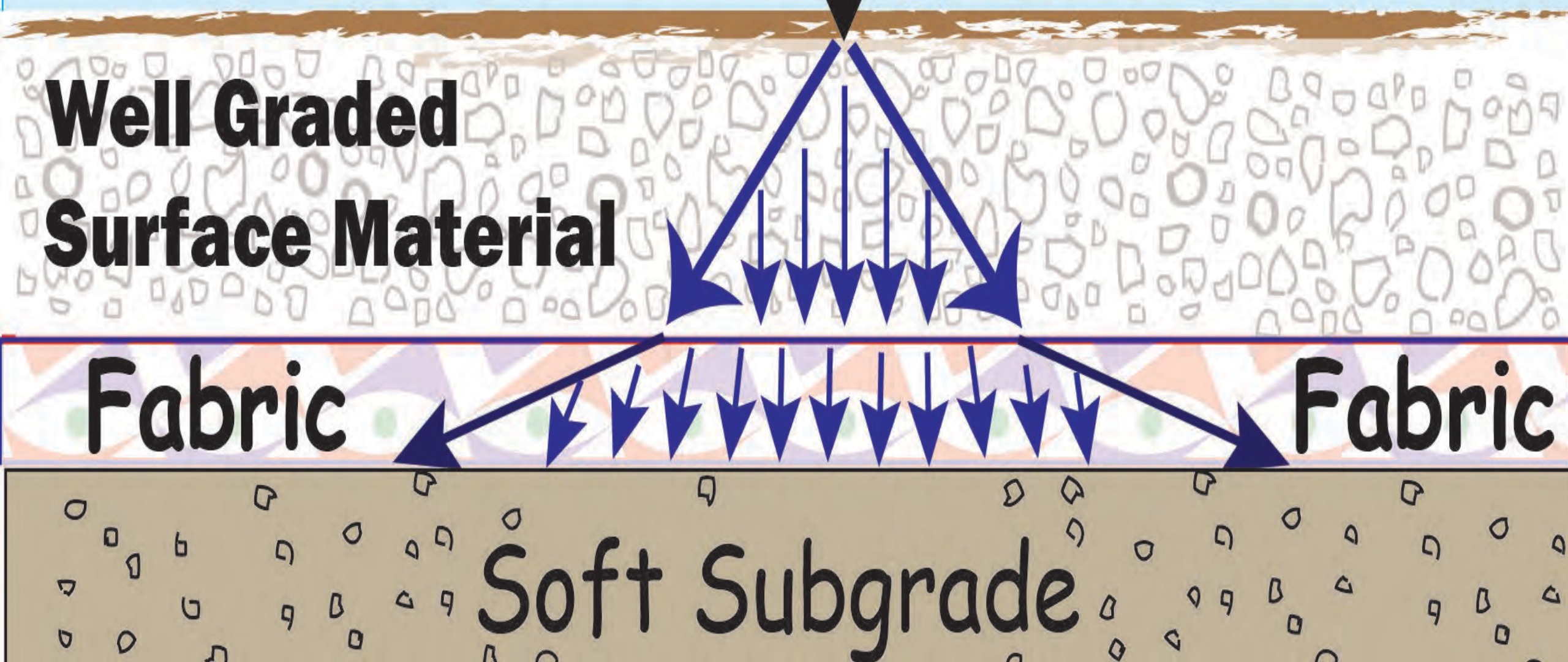


Fabric



Fabric

Soft Subgrade















Scott Whaley – Mandan, ND
426-8985
swhaley@tensarcorp.com



Ask a Pro (Russell Klimpel)

Tips for blading narrow gravel roads



Blade to 4% cross slope

Give it a haircut

Keep the grass off

Stays soft - moisture

Narrows roadway

Cut to the edge

NG - Curb and gutter with cut

Roll forward – shear off

Hit in the spring

Cut edges when frozen
Drop from 30 degrees to 10 degrees
Find an approach
4th and 5.5
Blowin' in the wind

Drop from 16' to 14'

Shout out to Russell Klimpel, Mountrail County Expert



Dust Control



1 vehicle

1 year

1 ton dust per mile

Each mile with 100 cars per day
- 100 tons of fines per year!



Gravel

Material Assessment





NDDOT Special Provision – Gravel Surfacing SP 714(14)

Sieve Size Or Testing Method	Aggregate
	Gravel Surfacing
	Percent passing or Test Limit
1"	100
3/4"	70 – 100
No. 4	38 – 75
No. 8	22 – 62
No. 30	12 – 45
No. 200	7 - 15
Plasticity Index (PI)	3 - 9
ND T 113, Shale (max %)	12.0%
AASHTO T 96, L.A. Abrasion (max %)	50%
NDDOT 4, Fractured Faces ¹	10%

**Too much coarse sand, too little rock,
will washboard badly**



**Too much coarse rock, lacking
coarse sands – will ravel badly**



**Good gravel surfacing (good
representation of sizes to fill voids, high
enough minus #200 to create road crust,
will hold chlorides well**



12/9/2021

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Future

EPIC EL
Dust Suppressant



eSyn™ is environmental Synergy

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STATE UNIVERSITY

RANKED IN THE TOP CATEGORY BY THE CARNEGIE COMMISSION ON HIGHER EDUCATION

**Field Testing and Optimization of
Soy Based Dust Control Agents**

James A Bahr

James.bahr@ndsu.edu

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North Dakota Local Technical Assistance Program

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North Dakota Local Technical Assistance Program added 2 new photos.
 Published by Dale Heglund · June 13, 2017 ·

North Dakota soy beans are poised to enhance rural road safety. How? Jim Bahr, NDSU Researcher, is helping the ND Soybean Council develop soy-based roadway dust control agents. Reduced dust on gravel roads means safer roads. In 2015 NDLTAP linked up with Jim to assist with Health Department process review and application approval, finding county test site options and planning, specifying dust control measuring equipment, and developing a process to evaluate the product. ... See More

Soy Treated Wet
 Soy Treated Dirt
 SOY Based
 Mag Chloride

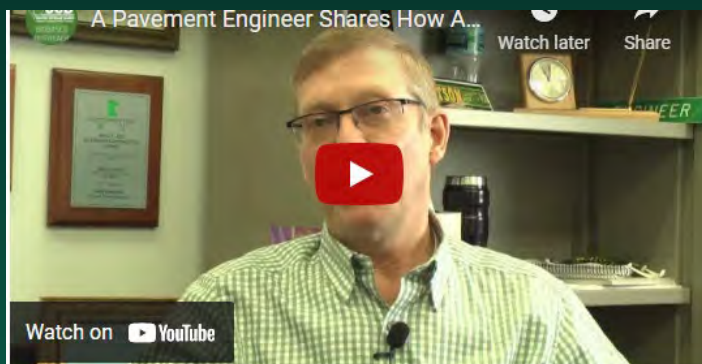
Harwood
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<https://ndsoybean.org/innovations/>



INNOVATIONS in TRANSPORTATION

brought to you by the Soybean Checkoff and UGPTI/NDLTAP

DUST CONTROL — SOY INNOVATIONS

Webinar hosted by UGPTI/NDLTAP




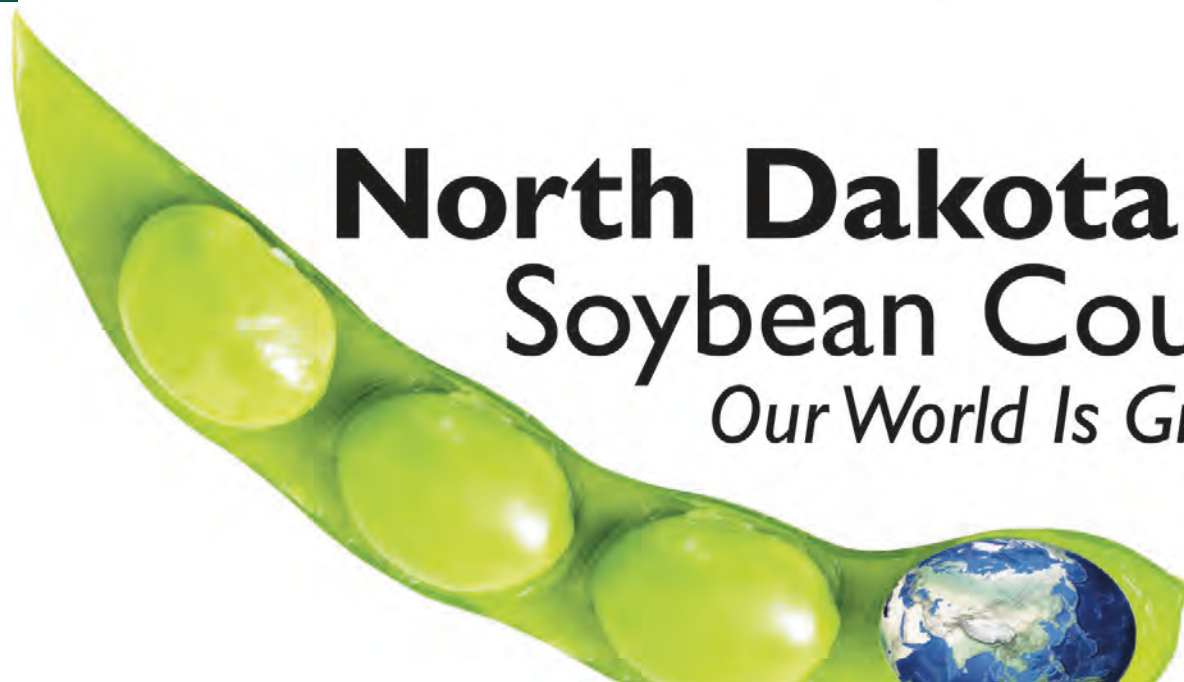
May 11, 2021

9:00 — 10:00 A.M. (CT)

<https://www.ndltap.org/events/soy/>

North Dakota Soybean Council

Our World Is Growing. 



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ITUTE

ROAD-HARD®

NATURAL SOIL HARDENER
WATER REPELLENT & DUST CONTROL

PRICING AND WEIGHTS QUICK REFERENCE TABLES

U.S. STANDARD MEASURE

Assumptions: • Average Soil Weight is 100 lbs ft³ or 2,700 lbs yd³
• Pricing is based on \$1.60 lb. or \$3.20 ft³ (assumes 100% soil, 0% aggregate) or \$86.40 yd³

Depth of Application	AGGREGATE CONTENT				
	0%	10%	30%	50%	70%
1 inch	\$0.27 ft ²	\$0.24 ft ²	\$0.19 ft ²	\$0.13 ft ²	\$0.08 ft ²
Product Weight	.16 lb ft ²	.14 lb ft ²	.11 lb ft ²	.08 lb ft ²	.05 lb ft ²
2 inches	\$0.54 ft ²	\$0.48 ft ²	\$0.38 ft ²	\$0.26 ft ²	\$0.16 ft ²
Product Weight	.32 lb ft ²	.28 lb ft ²	.22 lb ft ²	.16 lb ft ²	.10 lb ft ²
4 inches	\$1.08 ft ²	\$0.96 ft ²	\$0.76 ft ²	\$0.52 ft ²	\$0.32 ft ²
Product Weight	.64 lb ft ²	.56 lb ft ²	.44 lb ft ²	.32 lb ft ²	.20 lb ft ²
6 inches	\$1.62 ft ²	\$1.44 ft ²	\$1.14 ft ²	\$0.78 ft ²	\$0.48 ft ²
Product Weight	.96 lb ft ²	.84 lb ft ²	.66 lb ft ²	.48 lb ft ²	.30 lb ft ²

METRIC MEASURE

Assumptions: • Average Soil Weight is 1500 kg m³
• Pricing is based on \$3.52 kg or \$105.60 m³ (assumes 100% soil, 0% aggregate)

Depth of Application	AGGREGATE CONTENT				
	0%	10%	30%	50%	70%
2.5 cm	\$2.64 m ²	\$2.38 m ²	\$1.85 m ²	\$1.32 m ²	\$0.79 m ²
Product Weight	.76 kg m ²	.68 kg m ²	.53 kg m ²	.38 kg m ²	.29 kg m ²
5.0 cm	\$5.28 m ²	\$4.76 m ²	\$3.70 m ²	\$2.64 m ²	\$1.58 m ²
Product Weight	1.52 kg m ²	1.36 kg m ²	1.06 kg m ²	.76 kg m ²	.58 kg m ²
10.0 cm	\$11.60 m ²	\$9.52 m ²	\$7.40 m ²	\$5.28 m ²	\$3.69 m ²
Product Weight	3.04 kg m ²	2.72 kg m ²	2.12 kg m ²	1.52 kg m ²	1.16 kg m ²
15.0 cm	\$17.40 m ²	\$14.28 m ²	\$11.10 m ²	\$4.92 m ²	\$4.74 m ²
Product Weight	4.56 kg m ²	4.08 kg m ²	3.18 kg m ²	2.28 kg m ²	1.74 kg m ²

Pricing Effective June 1, 2018

All pricing is F.O.B. Memphis TN

Pricing valid for 180 days



25 lb sample

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1,500 lb
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NDLTAP & NDTOA

Together, we do great things!



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"Helping local transportation leaders grow"

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North Dakota Township
Officers Association

Township Transportation Funding Program Update – HB 1015

NDSU UPPER GREAT PLAINS
TRANSPORTATION INSTITUTE

Tim Horner – Transportation Engineer
October 14, 2021

Township Transportation Funding Program

- Legislative Foundation – **HB 1015** - 2021
 - Section 13 – Paragraph 2
- Additional Legislative Foundation
 - SB 2012 – NDDOT Budget Bill - Sec. 4
 - \$750,000, to the department of transportation for the purpose of providing grants to townships for emergency township road repairs
 - NDDOT solicited projects and received \$13.5 million in requests
 - Many are not FEMA eligible but some are



Township Transportation Funding Program

HB 1015 – The OMB Bill

- Section 13 – Paragraph 2
- Provided: NDDOT \$100 million, \$10 million of which was to be used for matching Federal Funds for Township Road and Bridge Projects.
- This implies seeking grants for township projects.

Township Transportation Funding Program

- Preliminary Concepts/Eligible Projects
 - Multi-township-based corridor improvements such as gravel improvements of structural nature
 - Need to be in excess of 3.0 inches thick with engineered and tested gravel meeting NDDOT specifications for surfacing gravel.
 - Bundling of minor structure improvements across a multi-township area.
 - Roadway flood resiliency improvements so the roadway meets the logical design “Q” of the pipes along the corridor.
 - Signing improvement projects for elevating safety across a multi-township region.

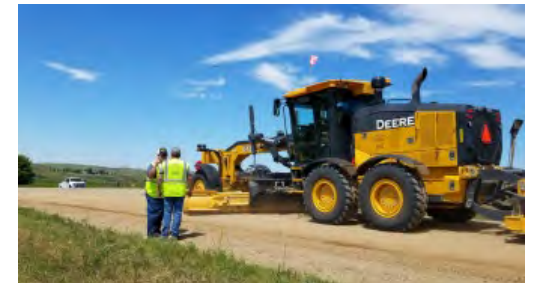




Table 4.2. Suggested gravel layer thicknesses for new or reconstructed rural roads.

Estimated daily no. of heavy trucks	Subgrade support condition ¹	Suggested minimum gravel layer thickness, mm (in)
0 to 5	Low	165 (6.5)
	Medium	140 (5.5)
	High	115 (4.5)
5 to 10	Low	215 (8.5)
	Medium	180 (7.0)
	High	140 (5.5)
10 to 25	Low	290 (11.5)
	Medium	230 (9.0)
	High	180 (7.0)
25 to 50	Low	370 (14.5)
	Medium	290 (11.5)
	High	215 (8.5)

Notes. ¹ Low subgrade support: average CBR \leq 3 percent; medium subgrade support: 3 percent $<$ average CBR \leq 10 percent; high subgrade support: average CBR $>$ 10 percent. ² CBR = California Bearing Ratio of the in-place subgrade soils. Methods of estimating CBR are discussed in section 7 of

CUBIC YARDS PER MILE

Width of the roadway in feet

Compacted depth of material in	Width of the roadway in feet										
	12	14	16	18	20	22	24	26	28	30	
1	244.44	285.19	325.93	366.67	407.41	448.15	488.89	529.63	570.37	611.11	
1.5	366.67	427.78	488.89	550	611.11	672.22	733.33	794.44	855.56	916.67	
2	488.89	570.37	651.85	733.33	814.81	896.3	977.78	1059.3	1140.7	1222.2	
2.5	611.11	712.96	814.81	916.67	1018.5	1120.4	1222.2	1324.1	1425.9	1527.8	
3	733.33	855.56	977.78	1100	1222.2	1344.4	1466.7	1588.9	1711.1	1833.3	
3.5	855.56	998.15	1140.7	1283.3	1425.9	1568.5	1711.1	1853.7	1996.3	2138.9	
4	977.78	1140.7	1303.7	1466.7	1629.6	1792.6	1955.6	2118.5	2281.5	2444.4	
4.5	1100	1283.3	1466.7	1650	1833.3	2016.7	2200	2383.3	2566.7	2750	
5	1222.2	1425.9	1629.6	1833.3	2037	2240.7	2444.4	2648.1	2851.9	3055.6	
5.5	1344.4	1568.5	1792.6	2016.7	2240.7	2464.8	2688.9	2913	3137	3361.1	
6	1466.7	1711.1	1955.6	2200	2444.4	2688.9	2933.3	3177.8	3422.2	3666.7	
6.5	1588.9	1853.7	2118.5	2383.3	2648.1	2913	3177.8	3442.6	3707.4	3972.2	
7	1711.1	1996.3	2281.5	2566.7	2851.9	3137	3422.2	3707.4	3992.6	4277.8	
7.5	1833.3	2138.9	2444.4	2750	3055.6	3361.1	3666.7	3972.2	4277.8	4583.3	
8	1955.6	2281.5	2607.4	2933.3	3259.3	3585.2	3911.1	4237	4563	4888.9	
8.5	2077.8	2403.7	2735.6	3067.4	3399.3	3731.1	4063	4394.9	4726.7	5058.6	
9	2200	2566.7	2933.3	3300	3666.7	4033.3	4400	4766.7	5133.3	5500	
9.5	2322.2	2709.3	3096.3	3483.3	3870.4	4257.4	4644.4	5031.5	5418.5	5805.6	
10	2444.4	2851.9	3259.3	3666.7	4074.1	4481.5	4888.9	5296.3	5703.7	6111.1	
10.5	2566.7	2994.4	3422.2	3850	4277.8	4705.6	5133.3	5561.1	5988.9	6416.7	
11	2688.9	3137	3585.2	4033.3	4481.5	4929.6	5377.8	5825.9	6274.1	6722.2	
11.5	2811.1	3279.6	3748.1	4216.7	4685.2	5153.7	5622.2	6090.7	6559.3	7027.8	
12	2933.3	3422.2	3911.1	4400	4888.9	5377.8	5866.7	6355.6	6844.4	7333.3	

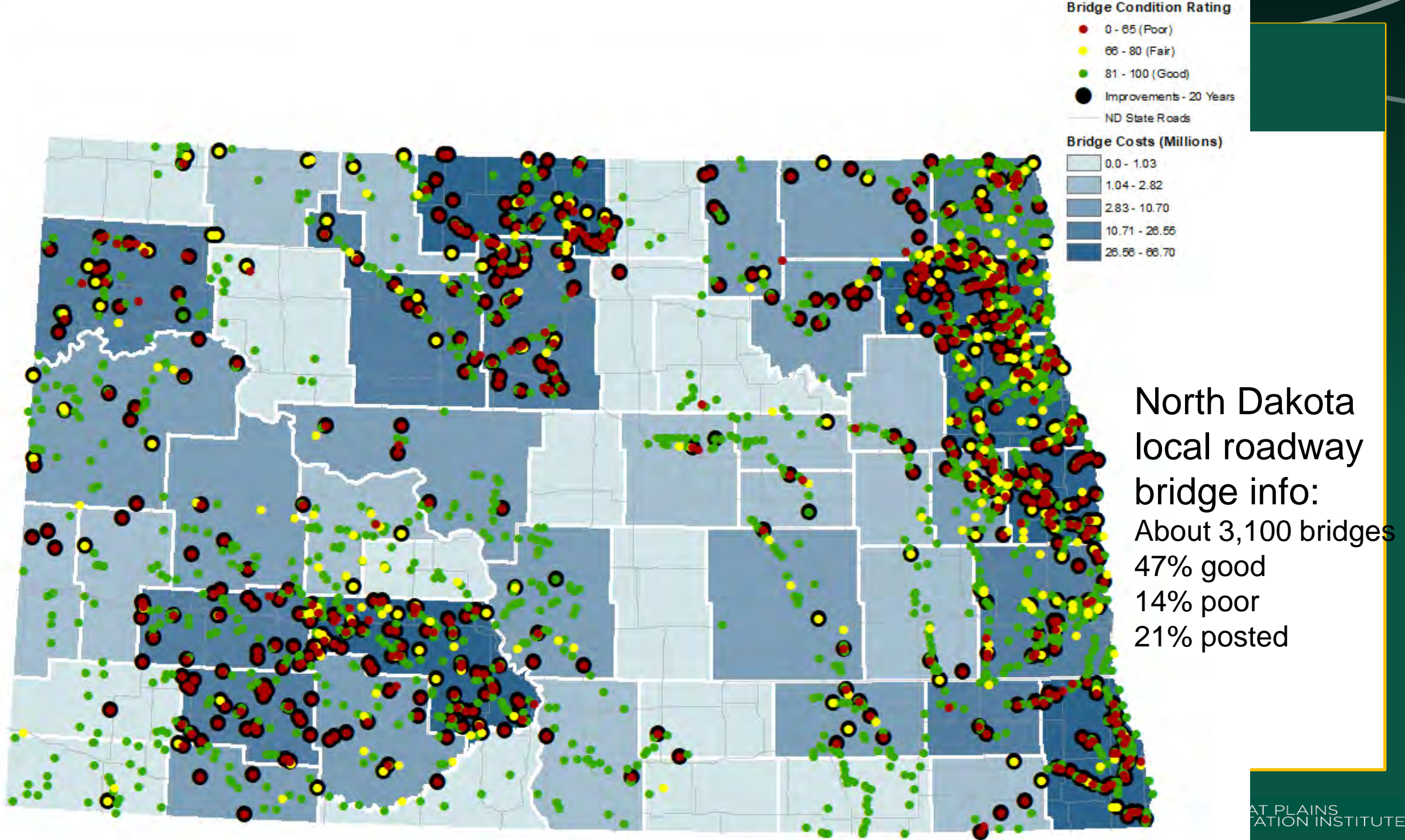
Note: To convert cubic yards to tons multiply the yards by 1.4 (this is approximate)

This chart uses a compaction factor of 25%.









Township Transportation Funding Program

- NDDOT is partnering with NDDOT to seek federal grants.
- This will call for grant writing to other federal agencies
 - FHWA grants generally not available for township roads.
 - Other agencies: DOD, DOE, DOC, DOI, etc.

Township Transportation Funding Program

- UGPTI Plan
 - Add specialized grant writing staff
 - Seeking experience with federal agencies other than FHWA
 - Seeking rural America expertise
 - Position is currently posted for applications
 - Intend to use this staff to train and advise existing staff to improve overall grant application expertise



Questions?

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