Watford City – Event Host McKenzie County
Dale C. Heglund, PE/PLS
NDLTAP Program Director

“Helping local transportation leaders grow”
Special thanks to our host and to our lunch sponsor: McKenzie County and Job Development Authority
Western Dakota Energy Association Roundtable

Watford City, ND - Wednesday, December 18, 2019
New McKenzie Public Works Facility, 1300 12th St SE, Watford City

9:00 AM to 2:00 PM Central Time (8:00 AM to 1:00 PM Mountain)

Moderator: Dale C. Heglund, UGPTI/NDLTAP

Wednesday, December 18, 2019
9:00 AM CT (6:00 AM MT)

Welcome and Introductions
Tore McCabe

NDFA & Legislative Update
Geoff Simon

Watford City Community Updates
Daniel Steinberg

McKenzie County Job Development Authority (JDA)

Operation Prairie Dog - Leopards
Breath Boyum/Janet Sanford

Drone Special Project Review
Tommy Kervelle, Night Services

Road Design Basics
Dana Larson, Ward County

Industry Updates

On Well Site Development — From Pad to Pumping
Guy Arman, Continental

Road Closure — What It Means at the Pad
Toby Romo, Whiting
Weather Predictions – Meet Our Meteorologist


FHWA-CRD C4 CL2

Tribal Update - MHA Nation

Needs Study Review

GRT - Construction Layer

Roundtable Discussions:
Roadway Safety Issues
County Road Building Plans for 2020
Industry Oil Development Plan
Success Stories
Industry Perspectives

11:30 AM Lunch Provided by JDA - McKenzie County Job Development Authority

12:30 PM Sessions (Continued)

2:00 PM CT Roundtable End - Safe Travels Home

2:00 – 3:00 PM - TENORM Informational Session – What’s Happening in Williams County?
3:30 PM – WEFA Board Meeting

Special thanks to McKenzie County and the JDA for supporting this event.
WDEA Roundtable Meeting Location
McKenzie County Public Works Facility, 1300 12th St SE, Watford City

NOLTAP Contacts
Curt Glasgow – cell 701-263-9950
Dale Heglund – cell 701-210-5993

WDGA Contact
Geoff Binnns – cell 701-527-1032
North Dakota has 107,000 miles of roadway

NDDOT - 7,400 miles – all paved – 92% asphalt and 8% concrete
Cities - 1,900 miles - 200 miles of gravel

County/Local Road Network has 97,700 miles
6,600 miles are paved, 59,000 miles are gravel surfaced (55% of total system!) and 32,000 miles are unsurfaced

<table>
<thead>
<tr>
<th>State Network</th>
<th>107,000 Miles</th>
<th>Paved</th>
<th>Gravel</th>
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<tr>
<td>Cities</td>
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<td>1,700</td>
<td>200</td>
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<tr>
<td>Local Roads</td>
<td>97,700</td>
<td>6,600</td>
<td>59,000</td>
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VISION
ZERO
Frost Heaves

Frost Damage in Pavement: Causes and Cures (YouTube video)

Sample expanded from 6 to 10 inches
Total Heaving: 70%

https://www.youtube.com/watch?v=7gjtFaCxBRU
FROST DAMAGE IN PAVEMENT: Causes and Cures
Sign Warrior Program

Poor hunter or serial sign killer? Morton County has had enough. Morton County Sheriff Kyle Kirchmeier has joined forces with Mike Aubol, Morton County Engineer, and Chad Schneider, Morton County Sign Crew Lead, to create an initiative aimed to put a stop to vandalism of signs, flashing beacons and other public property. The recent news release is a great way to get the public involved. Let’s face it, most damage is locally driven. As such, county residents working with ... See More
Saving signs = Saving lives

Report ALL vandals
Merry Christmas
Thank You!

WESTERN DAKOTA ENERGY ASSOCIATION
WDEA/NDLTAP
Roundtable – December 18, 2019
Watford City – Event Host McKenzie County

“Helping local transportation leaders grow”
Gravel Road Warrior – Join the Team
Gravel at or near 4%
Plasticity Index
Clay

The Glue that holds the rocks and sand together
Sand
2.00-0.05 mm

Silt
0.05-0.002 mm

Clay
Less than 0.002 mm

North Dakota Local Technical Assistance Program
The #1 problem with a gravel road:

It’s not a paved road!
Gravel Road Surfacing

The North Dakota DOT maintains only PAVED ROADS. As such, the DOT uses gravel for pavement base and shoulder material. They typically specify:

**CI 5 Gravel** – drainable base material that is placed beneath a paved surface. Water that passes through pavement cracks enters the CI 5 base. Since the CI 5 base has limited fine material, water easily drains to the outer edge of the roadway rather than progressing down into the subgrade. By keeping the subgrade (i.e., natural soil foundation) dry the NDDOT maximizes the roadway’s load carrying capacity.

**CI 13 Gravel** – shouldering material for highways. CI 13 shouldering material is essentially a CI 5 material with more fine material allowed (i.e., a dirty CI 5). The fine material provides a reduction in water passage and allows sensible utilization of pit materials.

Local roadway gravel surfacing requires modifications to the typical pavement base and shouldering gravel. Gravel without binder leads to wash boarding, dust, and float – all critical safety risks. By adding a binder we can create a quality gravel surfacing material for local gravel roads.

Quality gravel surfacing includes a binder material to hold the stone and sand together. Clay is a natural binder that can bind the stone and sand into a gravel matrix. Generally, fines may be clay or silt. Clay has good binder properties, silt does not. Clay has good engineering strength properties, silt does not. A gradation test tells us the amount of rock, sand and fines. A PI test (Plasticity Index – clay value) – this tells us how cohesive or ‘sticky’ the fine material is and as such how well it will perform to hold the rock and sand together. Combined, the tests help tell us how well the gravel will function as a surfacing material. See spec info below.

Specifying and testing gravel are key to insuring that you get the correct gravel for your gravel road driving surface.

1) **Do you specify** the gravel surfacing that you purchase?
   - Gradation – y/n
   - PI (clay) – y/n

2) **Do you test** the gravel surfacing as part of your quality assurance/payment plan?
   - Gradation – y/n
   - PI (clay) – y/n
4. **Plastic Index Adjustment Factor.**
The Engineer will determine the PI content adjustment factor using the Table 1.

<table>
<thead>
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<th>PI Average</th>
<th>Pay Adjustment Factor</th>
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<td>&gt; 9.1</td>
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<td>7.1 – 9.0</td>
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<td><strong>4.0 – 7.0</strong></td>
<td><strong>1.05</strong></td>
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<td>2.0 - 2.9</td>
<td>0.85</td>
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<tr>
<td>&lt; 1.9</td>
<td>Non Acceptance</td>
</tr>
</tbody>
</table>
NDLTAP
Local Technical Assistance Program

Together, we do great things!

Dale C. Heglund
701-318-6893
dale.heglund@ndsu.edu

“Helping local transportation leaders grow”
Guidelines for the Use of Oilfield Salt Brines for Dust and Ice Control

The North Dakota Administrative Code §33-24-02-02(5)(a)(2) states that wastes are exempt from waste management rules and are not considered a waste when it is: "(2) Used or reused as effective substitutes for commercial products; . . ."

When used in the manner outlined in this guidance, the North Dakota Department of Health (NDDoH) considers oilfield-produced saltwater (brine) to be an effective substitute for commercial dust and ice control products. If oilfield saltwater brine is used in a manner that does not fall within these guidelines it may be considered illegal disposal of a waste, and the user may be subject to penalties pursuant to the requirements in North Dakota Century Code Chapter 23-29 and Chapter 61-28, and North Dakota Administrative Code Article 33-16. Article 33-20.
Loan Program

Dynamic Cone Penetrometer
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GLUE FOR GRAVEL ROADS

May 1, 2018 (Tuesday) 6:00 – 8:00 PM CST
LISBON, ND – Ransom County, Veteran’s Home – 1903 Veteran’s Ave

May 2, 2018 (Wednesday) 9:00 – 10:00 AM CST
HARVEY, ND – Wells County – Harvey Shop

May 3, 2018 (Thursday) 4:00 – 6:00 PM CST
WATFORD CITY, ND – Mckenzie County Courthouse, 201 3rd St. NW

Registration Deadline: 1 week prior to workshop

Learn how to add nature’s plan to existing gravel surfacing and “Make-Go” is tough enough, but how can we make poor and tired gravel perform better. We will meet the mix and make it gravel expert Steve Merrikke, PE and LVR consultant, as he shares the secret of good gravel surfacing together. You’ll find out why is nature’s glue is special.

Following the class, we will head out to the field to apply our classroom learnings. We will add some bitumen to the existing gravel, demonstrating proper blower and DMC Wear Parts will demonstrate the quick-change cutting edge technology and blending clay into the mix. Todd Pederson, Pederson, will show how clay binder in gravel surfacing enhances dust treatments.

STEVE MONLUX worked 30 years for the U.S. Forest Service; volume roads in Montana and Idaho and many other roads we provided consulting services for counties, state LTPPs. To service his specialties include gravel surfacing, dust management, pavement management, quality assurance, and contracts.

Need help? Contact us at ndia

CHAINSAW TRAINING

April 14, 2018 (Monday) 8:00 – 5:00 PM CST
4-H comp – 2708 9th St. SW, Washburn, ND

Class Limit: 30 attendees $75 registration fee, includes lunch

April 17-19, 2018 (Thursday – Tuesday) 8:00 – 5:00 PM CST
4-H comp – 2708 9th St. SW, Washburn, ND

Class Limit: 12 attendees $50 registration fee, includes lunches (not breakfasts) and overnight accommodations in the new 4-H camp’s bunkhouses.

REGISTRATION DEADLINE: April 9, 2018 | NDITA will invoice post-workshop

BRIGHTEN 101

June 4, 2018 (Wednesday) 8:00 – 10:00 AM CST
Sheriff’s Dept. conference room – 3205 Gateway Dr, Grand Forks, ND

June 13, 2018 (Wednesday) 8:00 – 10:00 AM CST
Williams County Shop – 5214 13th Ave NW, Williston, ND

Registration Deadline: 1 week prior to workshop

Class Limit: 30 attendees per workshop

$50 Registration fee | NDITA will invoice post-training

Want to learn everything there is to know about bridges in one day? Bridge 101 is for you. While we can’t promise that you will learn EVERYTHING about bridges, we will help you understand the key elements, each:

- Bridge art
- “Why” we complete scour surveys
- What is a bridge
- How to read an AASHTO chart
- What all codes mean
- Loading factors

Aiming for classroom training, we will go to the field and walk through a bridge inspection. Bridge 101 will help bridge operators, truck drivers, road superintendents, county and city road officials, and those in local government or state departments learn about bridges.

Gary Doerr: NDOT Bridge Division. He has been a registered PE since 1984 and joined the NDOT Bridge Division in 2000 where he manages nearly 5,000 state and local bridges and bridge maintenance crews. Doerr manages the bridge inspection program that inspects more than 90% of these bridges every 24 months and produces reports to FHWA annually on the condition and safety of the system’s bridges.

Bryan Forch, Assistant Local Government Engineer for the NDOT. He graduated from the University of North Dakota and is a registered professional engineer. Forch previously worked for a consultant for three years and has worked for NDOT for 16 years in materials and research and local government.

Dale Higdon: NDOT Program Director. Forty years of transportation experience ranging from equipment operator to design engineer. career focus has been to promote a quality roadway network by helping others understand roadway engineering principles, the historical development of various work practices, construction, and technology implementation processes.

Need help? Contact us at ndia@ndia.org or 701.224.0600

NDIA Upper Great Plains Transportation Institute North Dakota Local Technical Assistance Program
Roadway development follows a logical progression: grade, gravel, and pave. But sometimes it’s welcome and cost-effective to step back to gravel and replace the “Rough Road Ahead” sign with a “Pavement Ends” sign.

Some local roads should never have been paved. With others, conditions change, creating the need to evaluate the roadway surface and long-term strategies. Either way, the opportunity to convert a distressed paved road to an engineered gravel road is a viable option.

The local roadway network is the economic backbone of North Dakota. Of the 107,000 miles of roadway in the state, the North Dakota Department of Transportation (NDDOT) manages about 7,400 miles of paved roadway. The remaining mileage is under local, city, township, Tribal, and county management. The county/township road network includes about 6,600 miles of paved roads, 59,000 miles of gravel roads and 32,000 miles of unsurfaced roads.

Highway realignments can result in jurisdictional road transfers that are made with the intent to provide a benefit to the local users. But over time, these transferred roads can become a liability. Let’s take a look at a sample project in North Dakota.

Not far south of the U.S.-Canadian border, Mountrail County owns and maintains an old state highway segment. The original roadway east of Blaisdell was built in 1936 as State Highway 2. In 1939, the base was stabilized to provide an improved “all-weather” surface and, in 1953, the first asphalt wear course was placed.

In 1978, the highway was realigned and the original roadway segment was transferred to Mountrail County. The county accepted the state’s no-fee roadway transfer, recognizing local citizen demands to maintain convenient farm to market access. With the bulk of the traffic expected to shift to the new state highway, it was expected that the old route would last forever or at least for a very long time.
Preventative maintenance is the key to wisely utilizing public dollars and building and maintaining an effective transportation system. This is particularly important for regions such as the Upper Great Plains and northern Rocky Mountains where “road miles” and “land area” far exceed population, weather and environment present a never ending series of cycles and challenges, and subgrades and base layers are many times composed of or contaminated by water and frost susceptible, fine grained soils. The first step in pavement preservation is crack sealing/crack filling as water is a constant, sometimes “unseen”, but always ever present enemy of road performance. Effective and timely materials, methods and placement are the first step in this critical pavement preservation technique.\(^1\)

— Ken Swedeem, Dakota Asphalt Pavement Association (DAPA) Executive Director

Crack sealing/filling is a cost effective pavement maintenance tool that can be effectively completed by county workers or contractors. Knowing how to most effectively employ this technique is important, as failure of this product is costly, especially in low budget situations. This review includes some researched best practices from NDDOT, FHWA, and other sources. Crack sealing and crack filling are similar processes which prevent water infiltration into the pavement layers. Crack sealing is commonly referred to as a “route and seal” which can include routing out the cracks and is best for cracks that are considered “working.” Crack filling is commonly just filling of existing cracks with sealant.

The ideal crack seal/fill creates a watertight seal over longitudinal and transverse cracks in the roadway. This prevents infiltration of water into the asphalt layer, base and subgrade, extending the life of the pavement. Cracks must be clean, dry and at least 1/8” wide to be candidates to be filled or sealed. Block and fatigue cracks are not good candidates to be sealed, as they are symptoms of pavement failure. Cracks wider than 1.5” will need to be evaluated for filling, as these are also symptoms of pavement failure. Thinner cracks may be routed to allow for a better seal placement. If a crack is routed, it should be routed to a minimum of 3/4” width to allow for a reservoir of sealant.
The Truck Weight Calculator helps the motor carrier industry, agricultural producers and others determine the maximum legal weight that any set of axles on a vehicle/vehicle combination may carry on North Dakota interstate and state highways.

- The formula for the calculator is a weight-to-length ratio.
- The app features simple picture explanations for intuitive use.
- The calculator generates a printable report with truck weight calculation results.

Weight calculations for a vehicle traveling on North Dakota’s state highways and local roads are slightly different from the weight calculations for vehicles traveling on North Dakota’s interstate system.
Investment Strategies - Alternatives

### Agency Cost Parameters Setup

<table>
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<tr>
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<th>Treatment Name</th>
<th>MAINTENANCE Application Times Per Year</th>
<th>COST Year Interval Between Applications</th>
<th>Application Start Year</th>
<th>Unit Cost (dollars)</th>
<th>Unit Selection</th>
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**INITIAL COST**

- Total Initial Cost ($/mile): $725,115
- Initial Costs Calculator
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