DULUTH, MINNESOTA
SEPTEMBER 17-20, 2018

Pavement to Gravel Process

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Depaving
Reversion
Converting Distressed Paved Roads
to Engineered Unpaved Roads

Pavement to Gravel Process

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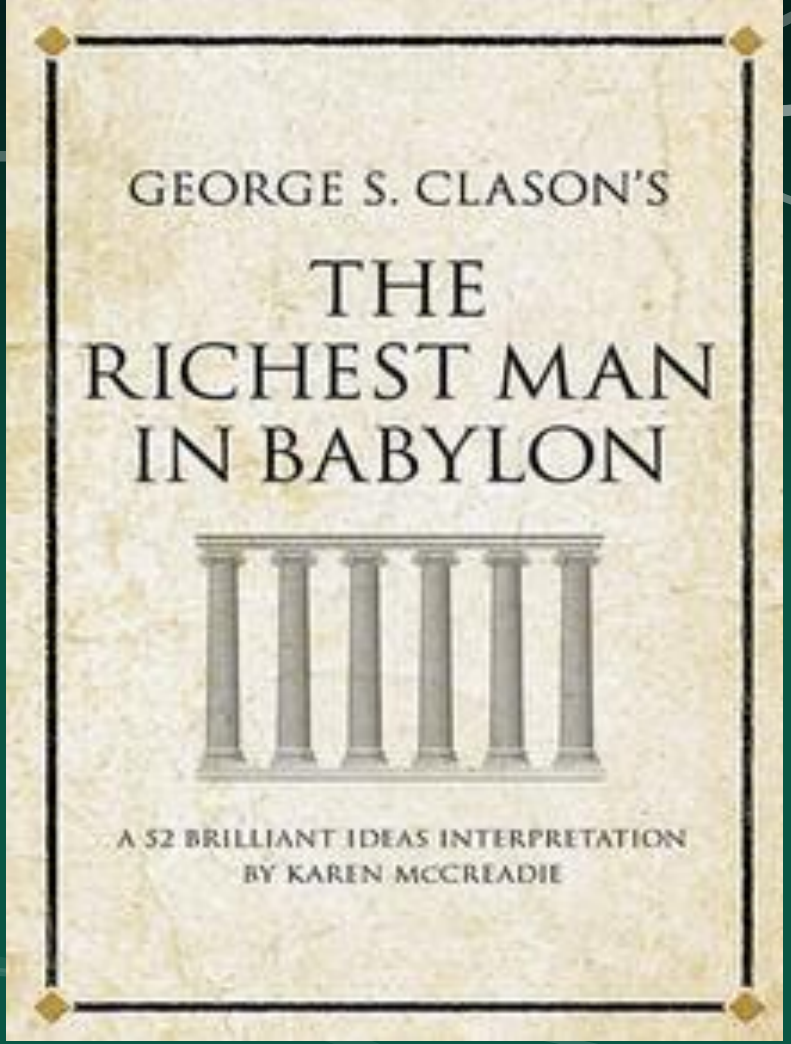
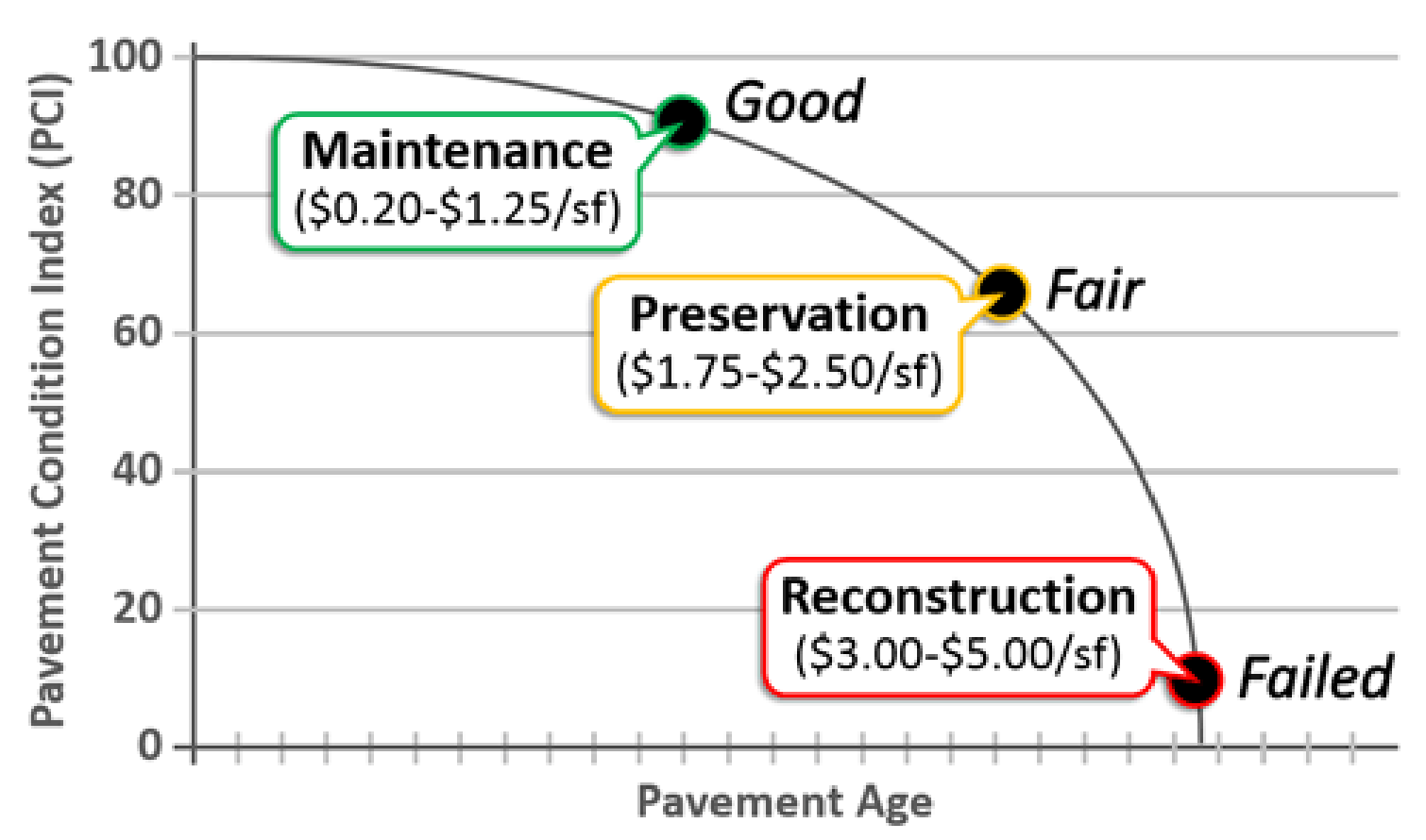
The #1 problem with a gravel road is:

It’s not a paved road!


GEORGE S. CLASON'S
THE RICHEST MAN IN BABYLON
A 52 BRILLIANT IDEAS INTERPRETATION
BY KAREN MCCREADIE


NEXT
COUNTY ROAD
ROUGH
ROAD
Lets get plowed
TIME CARDS
CROSSING PERMITS
INVOICES

Pavement Deterioration



Investment Strategies - Alternatives

Agency Cost Parameters Setup

HMA | AST | Gravel | Dust Control | Stabilized Gravel

HMA

INITIAL COST

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

MAINTENANCE COST

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

[et] [ck to Common Parameters Setup] [View Analysis Summary] [Help]


North
Dakota
Stanley
North Dakota
Minnesota

PAVEMENT ENDS

A North Dakota Success Story

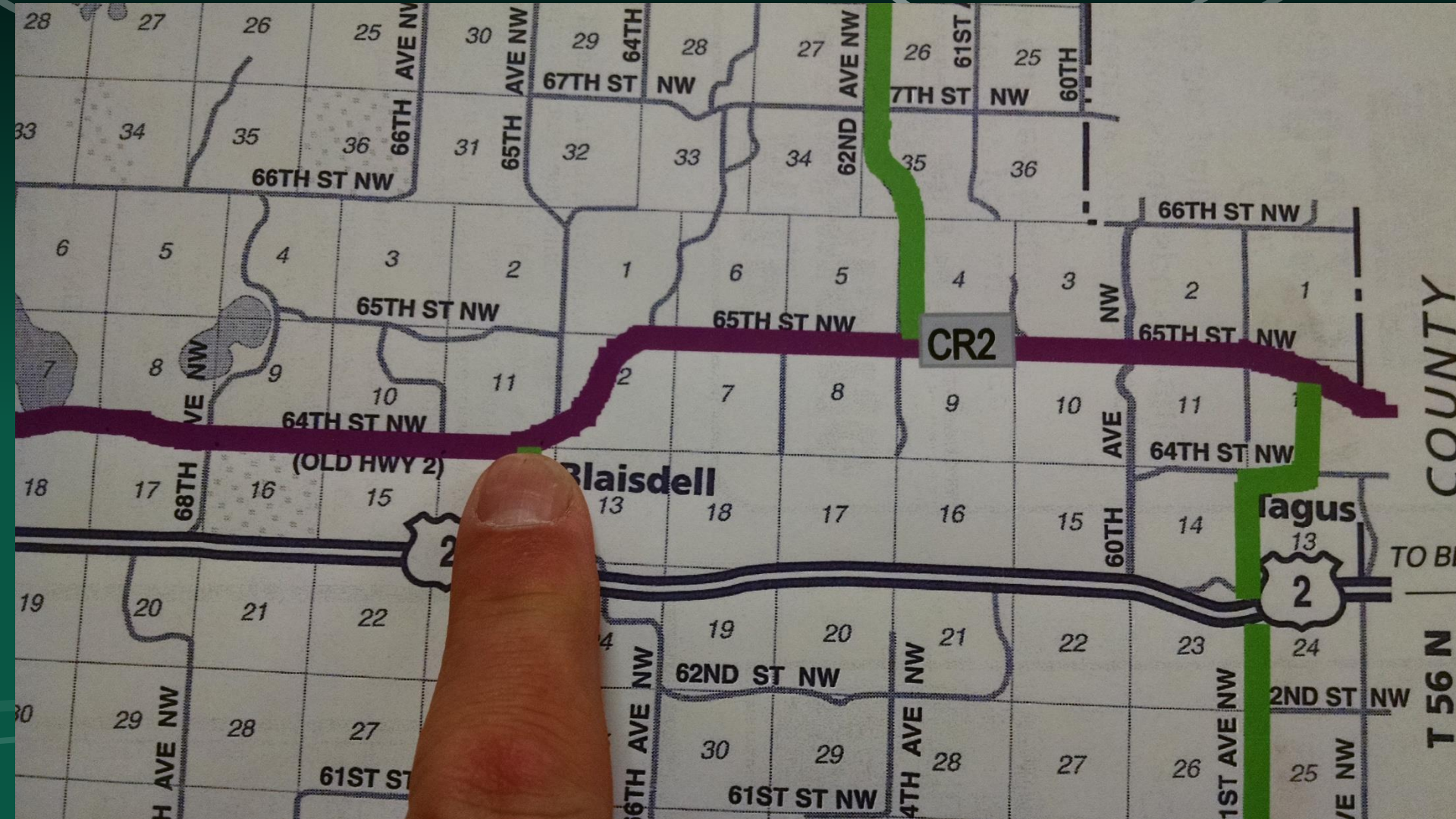
by Dale C. Heglund, NDLTAP Director

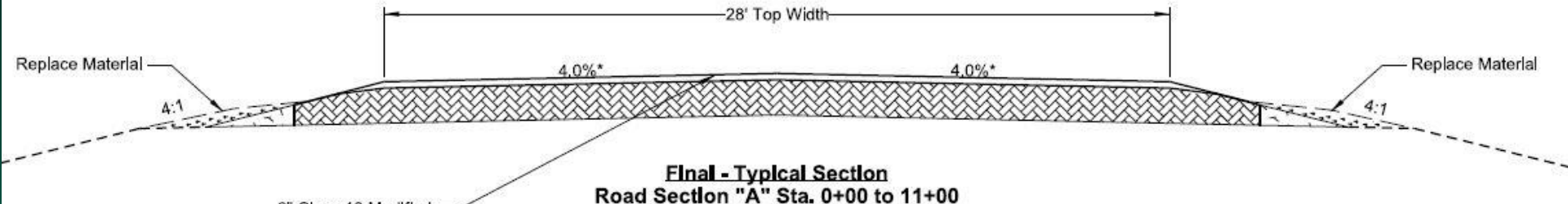
Roadway development follows a logical progression: grade, gravel, and pave. But sometimes it's welcome and cost-effective to step back to gravel and replace the "Rough Road Ahead" sign with a "Pavement Ends" sign.

Some local roads should never have been paved. With others, conditions change, creating the need to evaluate the roadway surfacing 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


MOUNTRAIL COUNTY
DEPT. OF
ROADS & BRIDGES
Proudly Serving the People of
Mountrail County Since 1909


66TH ST NW
65TH ST NW
CR2
64TH ST NW
(OLD HWY 2)
Blaisdell
Tagus
62ND ST NW
61ST ST NW
67TH ST NW
66TH AVE NW
65TH AVE NW
64TH AVE NW
62ND AVE NW
61ST AVE NW
60TH AVE
68TH AVE NW
2
T 56 N
COUNTY



Final - Typical Section
Road Section "A" Sta. 0+00 to 11+00
Road Section "B" Sta. 0+00 to 216+70

*Normal road crown should be 4% in straight alignment areas. Match existing super elevations and transitions.

302-P01 AGGREGATE SURFACE COURSE CL13: Aggregate Surface Course CL 13 shall be placed after full depth reclamation and surface is shaped to 4% normal crown. Aggregate quantity is estimated at 37.4 Tons per Station. An additional 704 Tons is included for approaches.

Provide a Class 13 Aggregate with a Plasticity Index (PI) ranging from 4 to 9 and meets the requirements of Section 816.02, "Miscellaneous Aggregates".

The PI is to be determined in accordance with test ND T90, "Determining the Plastic Limit and Plasticity Index".

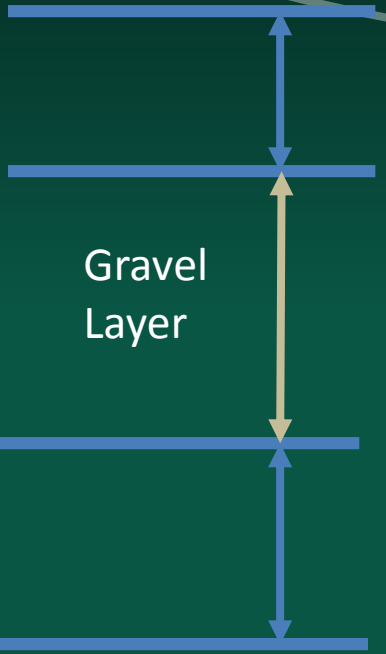
A contract adjustment will be administered if the PI is not within the specified range. The Engineer will determine the PI adjustment factor if the limits for PI are exceeded, as calculated:

PI Adjustment Factor = 5 percent x (Average of 3 Samples – Allowable PI)

If the PI is determined to be greater than 12, the material will be rejected.

Material Breakdown

Multiple Layers



Foundation Repairs

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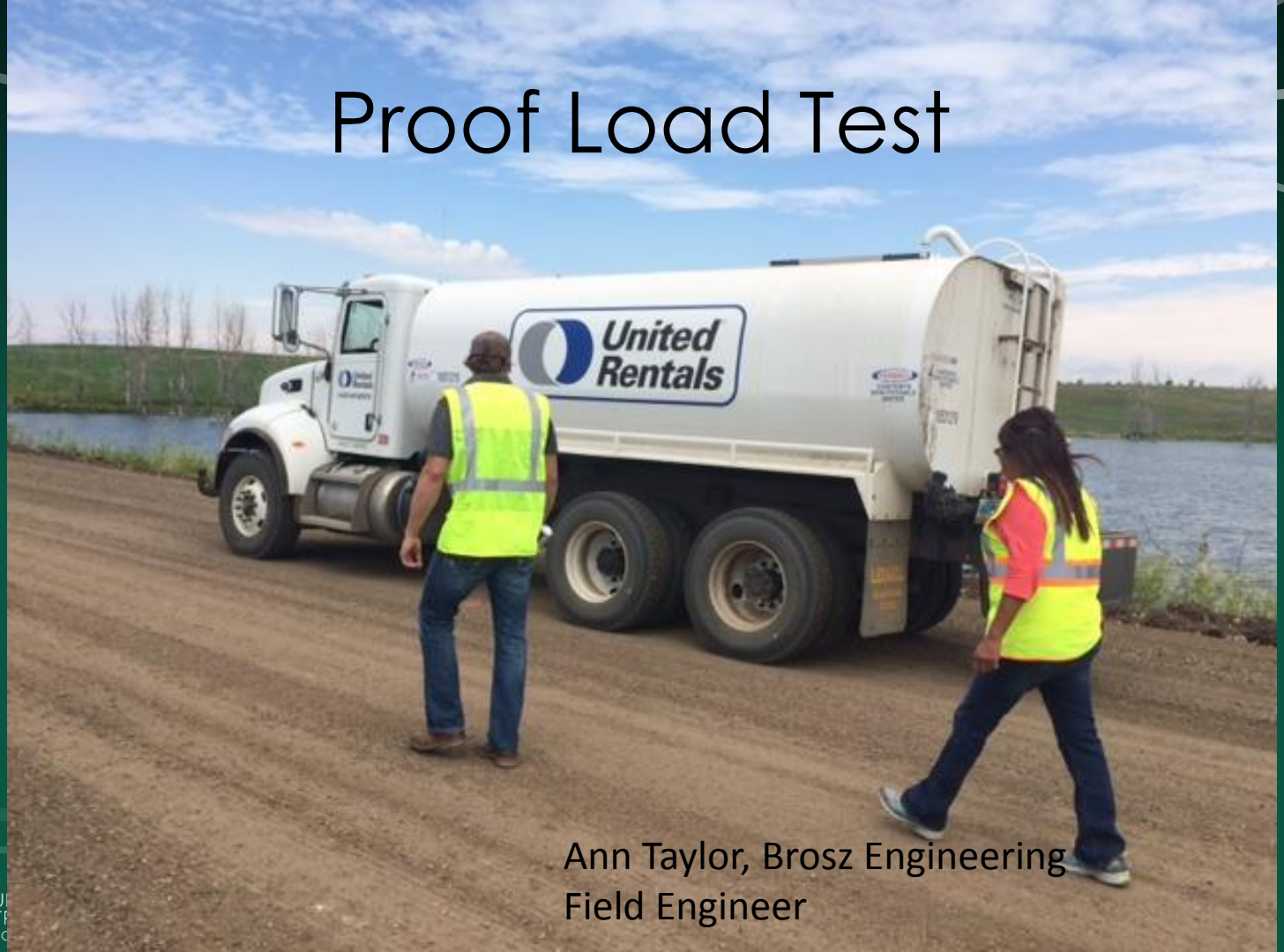
Proof Load Test



Ann Taylor, Brosz Engineering
Field Engineer

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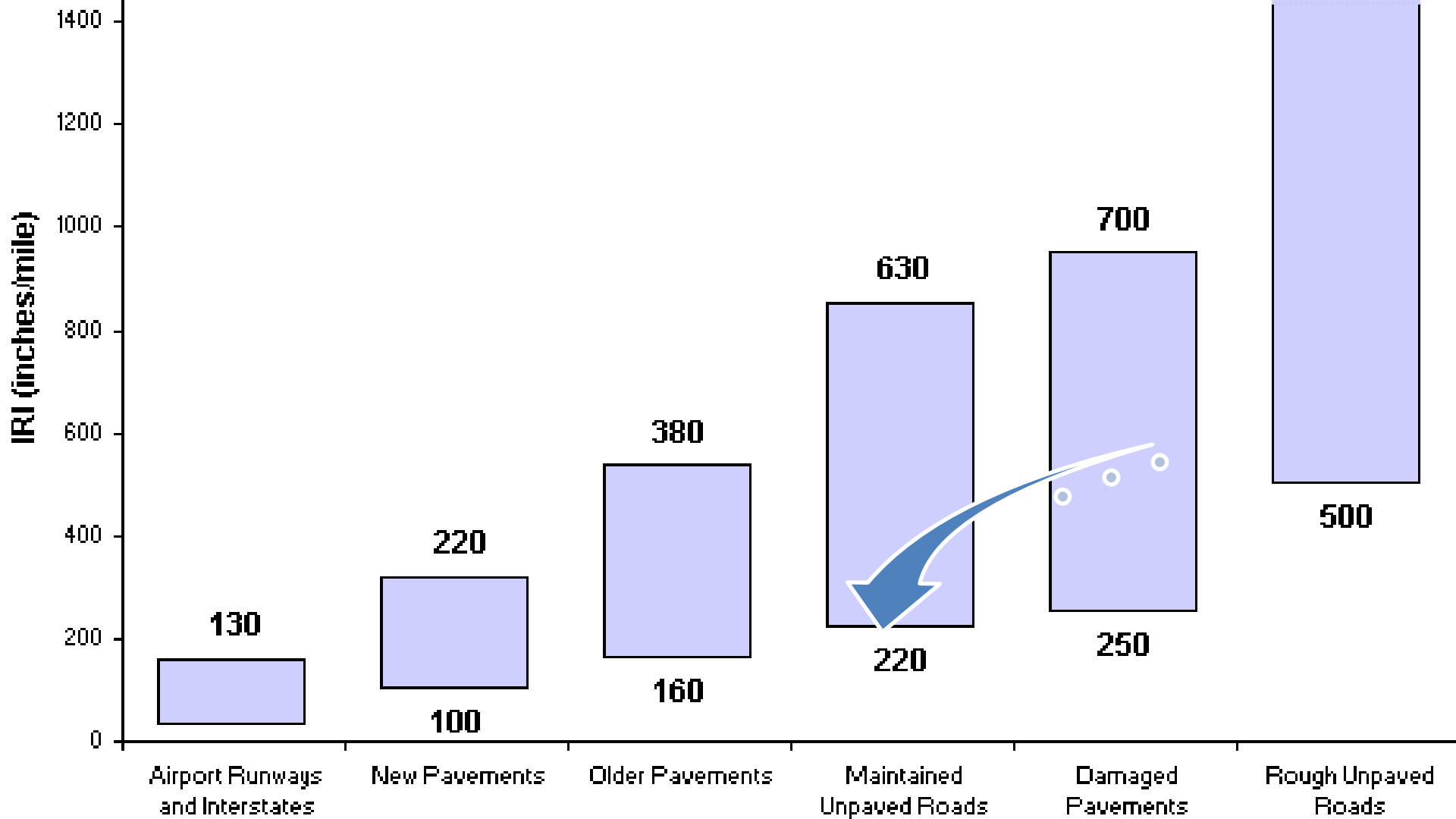
Dust Suppressant

NDSU

Transitions


IRI (inches/mile)
1400
1200
1000
800
600
400
200
0
130
220
100
380
160
630
220
700
250
500
Airport Runways and Interstates
New Pavements
Older Pavements
Maintained Unpaved Roads
Damaged Pavements
Rough Unpaved Roads


SPEED
LIMIT
35
WHY IS MONDAY SO FAR FROM FRIDAY, BUT FRIDAY SO
GRAVEL
Dust Control
Mountrail County
YEAR ROUND
LOAD RESTRICTIONS
November 2017
December 2017
January 2018
February 2018
March 2018
April 2018
May 2018


AXLE
WEIGHT
LIMIT
6 TONS
65,000 LBS
MAX
NO
OVERWEIGHT TRAVEL
2
BY
LEGAL
WEIGHT
105,500 LBS
MAX

Department of Defense

Air Force Comments

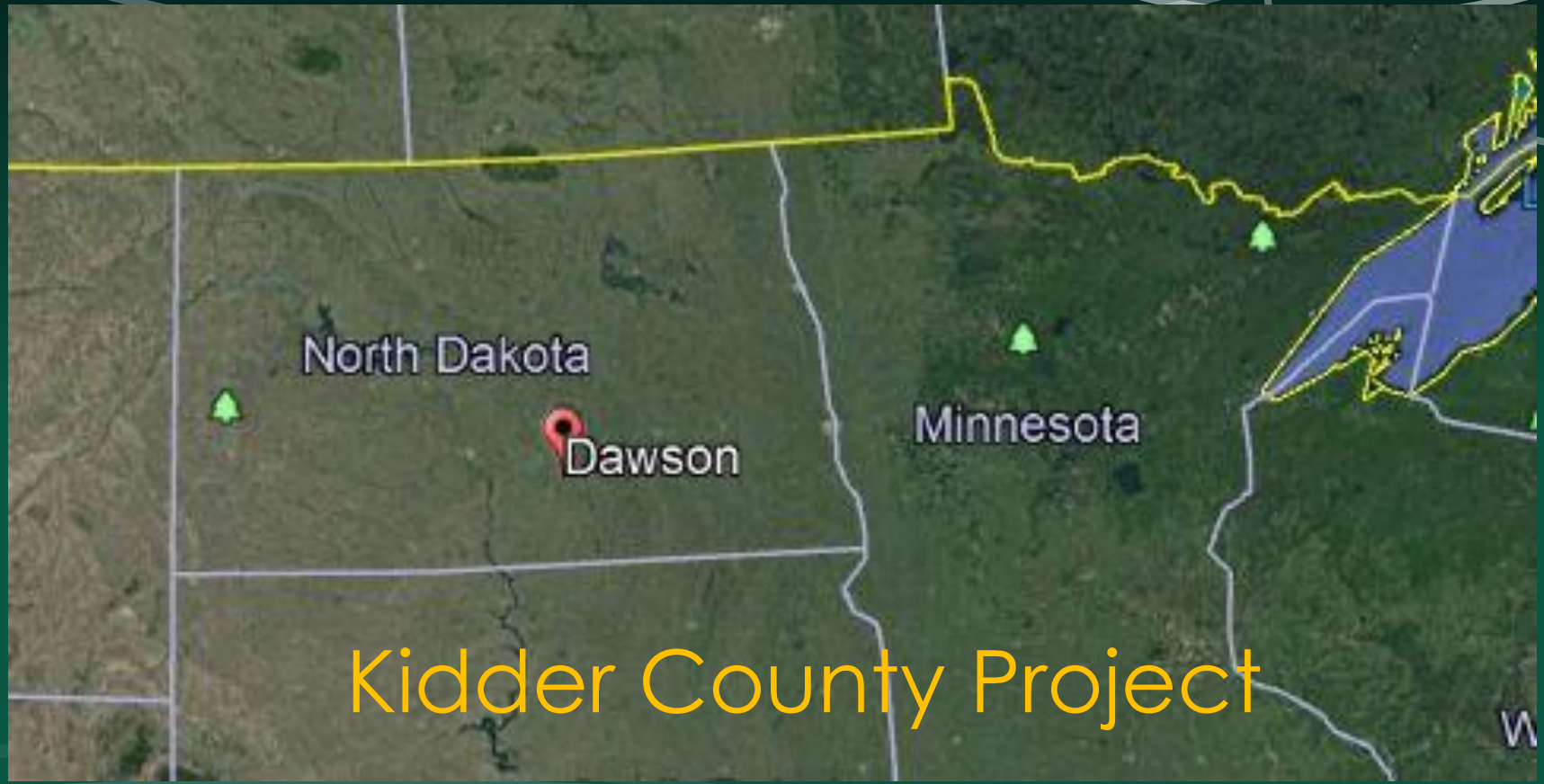
… steadily deteriorating condition

… condition below a gravel road

… condition may affect their mission

… very happy with the results

… no longer a concern that the road may adversely affect their mission



Kidder County Project


08 . 29 . 2008 00 : 52

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BLENDED BASE COURSE: The blended base course shall consist of an uniform blend of the new Aggregate Class 3M (2"), existing bituminous pavement (approx. 2.5"), and gravel base (approx. 6"). The existing asphalt pavement material shall be processed to provide a nominal 1" maximum size. The unit price bid for "Blended Base Course" shall include all costs for sizing, blending, laying, and compacting the blended base.

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Roadway Network, Public Expectation

North Dakota's County/Local Road Network: 97,600 miles

6,600 miles are paved
59,000 miles are gravel surfaced
32,000 miles are unsurfaced

Conversion Comments

Initial public response – Why???

… ADT, Safety, Cost, Ride…

Proper selection => pleased customers

NDLTAP - technical resource

ROAD READY R3 RESEARCH

MAY 2018 NO. 3

RESEARCH REVIEW: Roadway Reversion

by Andrew Wrucke, NDLTAP Technical Expert

"The rural road network is just as critical to the nation's economy as the Interstate system, but a large percentage of the sealed low volume part of it (carrying less than 400 vehicles per day) is way past its use-by date. Long gone are the days where funding was available to overlay or reseal at optimal intervals, which begs the question whether some of the very lightly trafficked roads (less than 100 vpd) should have been surfaced in the first place if funds to reseal them after 8 to 10 years were unlikely to be available. Hindsight is of course easy, but rather than dwell on what should have been, we have to explore what can we do with what we have. Continue trying to maintain them with band-aids, or "upgrade" them to an engineered unpaved standard? Agencies nationwide are increasingly favoring the latter option because these roads are easier to maintain, and chemical treatments can be used to keep the surface material in place and reduce dust to the extent that they can resealed at a later date with minimal additional cost if sustainable funds become available."

– David Jones, Associate Director, University of California Pavement Research Center
Chair, Transportation Research Board Standing Committee on Low Volume Roads

Road before reversion

Previously, low construction and maintenance costs for pavements allowed local jurisdictions to pave large portions of their roadway network. More recently, construction and maintenance costs for asphalt roadways have risen faster than inflation and, more importantly, funding. Because of this, local roadway jurisdictions are un-paving, or reverting roadways back to an engineered gravel surface. The process has been used in more than half of the states in the United States, in Canada, and in Finland. It requires proper equipment, materials, final roadway grading and full public support to be successful. This document will review current practices including some researched best practices from NDLTAP, FHWA, and other sources.

Road after reversion

Several factors must be considered before a roadway is reverted back to gravel. This includes the current roadway condition, safety of the corridor, the social aspects of the roadway (commerce, residents) and traffic volume. Jurisdictions must make their own decisions on the best surface for the roadway based on these factors and their road management plan. Often, the economics and the future maintenance needs lead to the decision for a roadway reversion. One tool to help with the economic analysis of future maintenance is the Local Road Surface Selection Tool (https://dotsc.ugpti.ndsu.nodak.edu/SurfaceSelection/).

Reversions take two forms, active and passive. Active reversions are where a local jurisdiction makes the decision to change a paved roadway to gravel using construction equipment and design techniques to produce an engineered final product. In passive reversions, the paved roadway is allowed to deteriorate to an unpaved state, and then is maintained as a gravel or unpaved roadway surface. Passive reversions happen slowly over time, while active reversions are usually a local construction project which turns an entire segment of roadway to gravel.

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NCHRP SYNTHESIS 485

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Converting Paved Roads to Unpaved

A Synthesis of Highway Practice

TRB TRANSPORTATION RESEARCH BOARD
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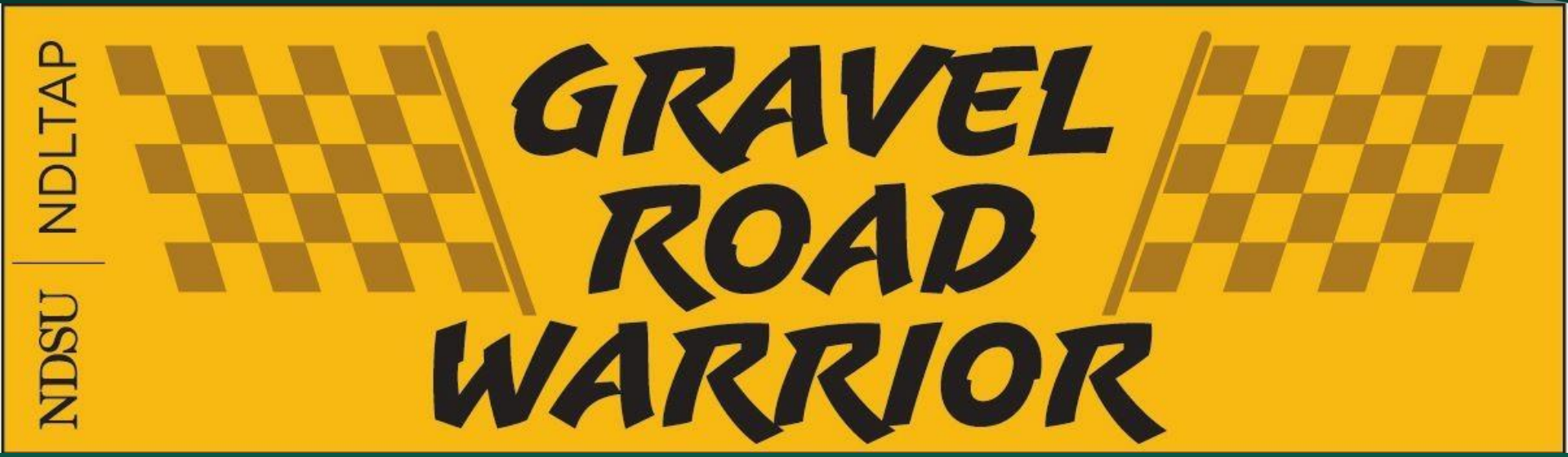
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GRAVEL
ROAD
WARRIOR

The #1 problem with a gravel road used to be:

It's not a paved road!

Hans Langseth – 18’-6” beard

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