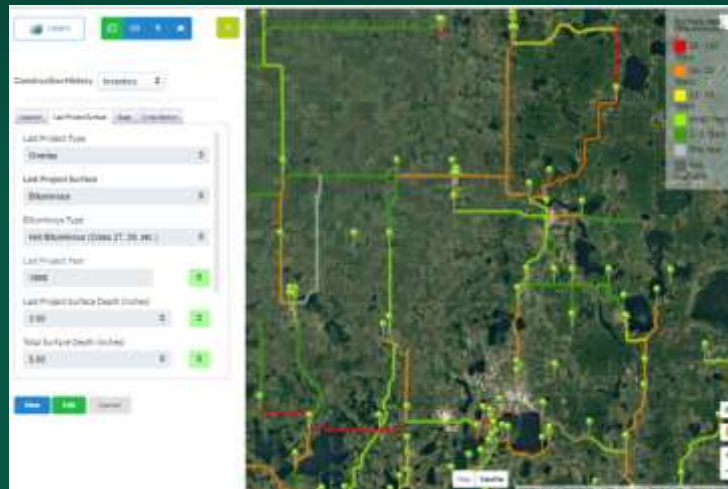


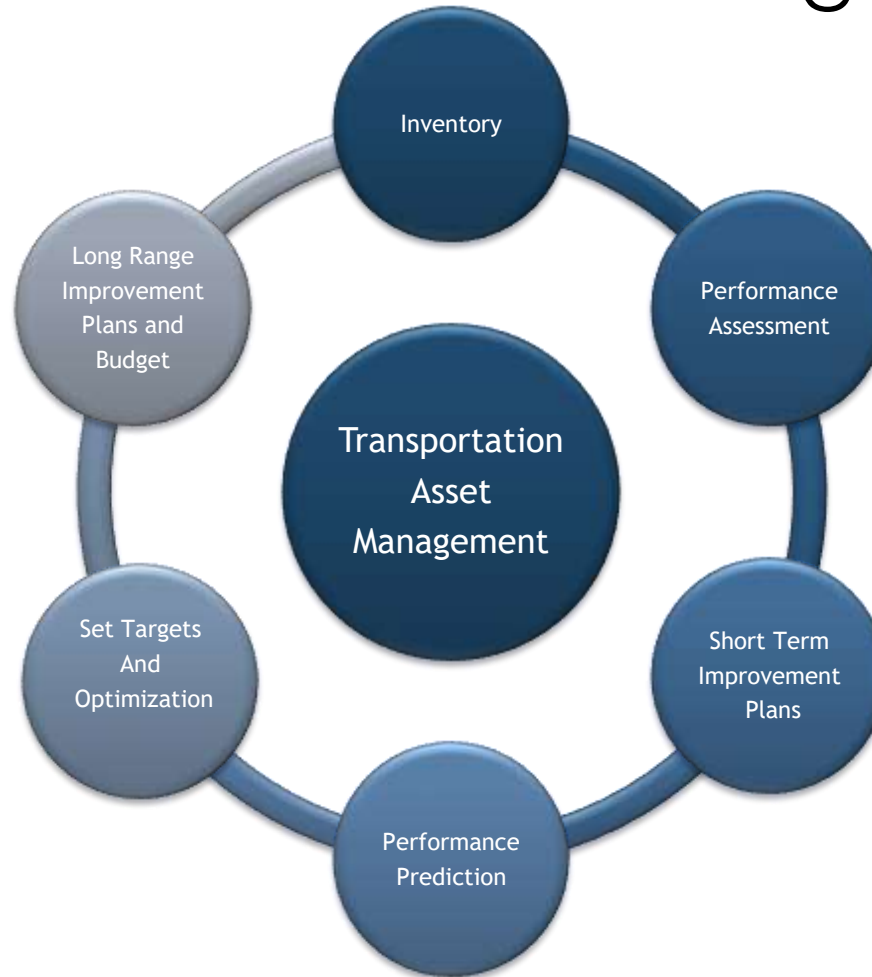
Asset Management with GRIT

2021 Great Plains Tribal Transportation Workshop



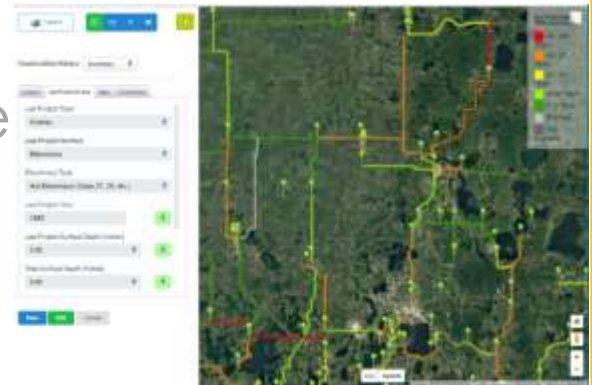
Brad Wentz P.E.
Upper Great Plains Transportation Institute

Transportation Asset Management



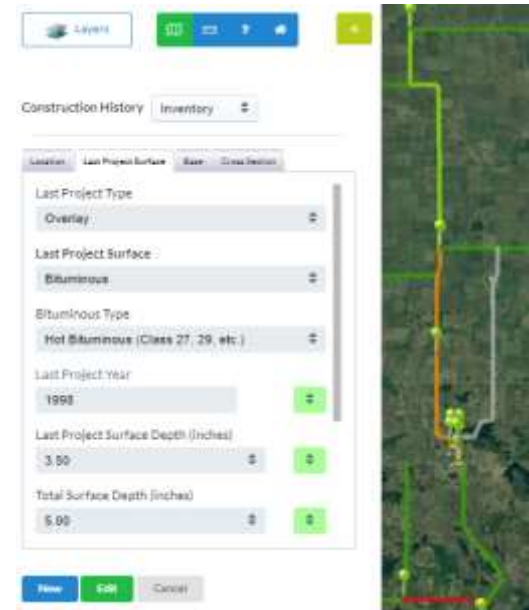
Inventory – why so important?

- Document the history of our assets
 - Retiring Staff
- Easy to convey what we have
 - New staff, Leaders, Public
- Develop improvement plans
- Justify improvement plans
- Answer questions quickly and reduce costs
- See what others are doing
- Research



What is GRIT?

- ND Legislative Needs Study – Local & Tribal Nations
- Developed model to estimate 20 yr needs
 - Developed Statewide Traffic Model
 - Pavement Condition Data collected
 - Inventory data not available
- Develop an Asset Inventory Tool
- DOTSC developed GRIT



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**Geographic Roadway
Inventory Tool (GRIT)**

Event Proceedings

Staff Presentations

Other Resources *(Surface
Selection Tool, Grain Industry
Data, etc.)*

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Geographic Roadway Inventory Tool (GRIT)

The Geographic Roadway Inventory Tool is an easy-to-use asset management program developed for county road managers. The development of GRIT was a team effort, led by UGPTI. To ensure the needs of county road managers were met, a steering committee comprised of 10 county transportation leaders and representatives from the ND Department of Transportation, the ND Association of Counties and UGPTI provided feedback and guidance throughout the process. GRIT continues to be enhanced with new and improved features and expanded to other states including Minnesota, South Dakota, and Montana.

GRIT Links

- [GRIT Editor](#)
- [Map Viewers](#)
- [Like us on Facebook](#)
- [Help](#)
- [Steering Committee](#)

Presentations

- [Aug. 12, 2021 Webinar: GRIT Updates & New Features](#)
- [Apr. 7, 2020 Webinar: GRIT Emergency Events, Updating Construction History and Planning](#)
- [May 16, 2018 Webinar: GRIT 2.0 New Layout](#)
- [Jan. 11, 2018 Webinar: GRIT Photo Logging](#)
- [Oct. 11, 2017 Webinar: GRIT Highlights and Enhancements](#)
- [Aug. 8, 2016 Webinar: GRIT Construction Layer](#)
- [Mar. 21, 2016 Webinar: GRIT Viewer Release](#)
- [Dec. 9, 2015 Statewide Rollout Webinar: GRIT 1.0](#)
- [Nov. 18, 2015 Webinar: GRIT 1.0](#)
- [Aug. 26, 2015 Webinar](#)
- [Aug. 12, 2015 Kickoff Webinar](#)

Layers

Construction History Inventory

Location Last Project Surface Base Cross Section

Last Project Type
Overlay

Last Project Surface
Bituminous

Bituminous Type
Hot Bituminous (Class 27, 29, etc.)

Last Project Year
1999

Last Project Surface Depth (inches)
3.50

Total Surface Depth (inches)
5.00

New Edit Cancel

GRIT 2.0 Editing Tool

- Four Layers with many attributes
- Inventory and Maintenance Data

Layer Select

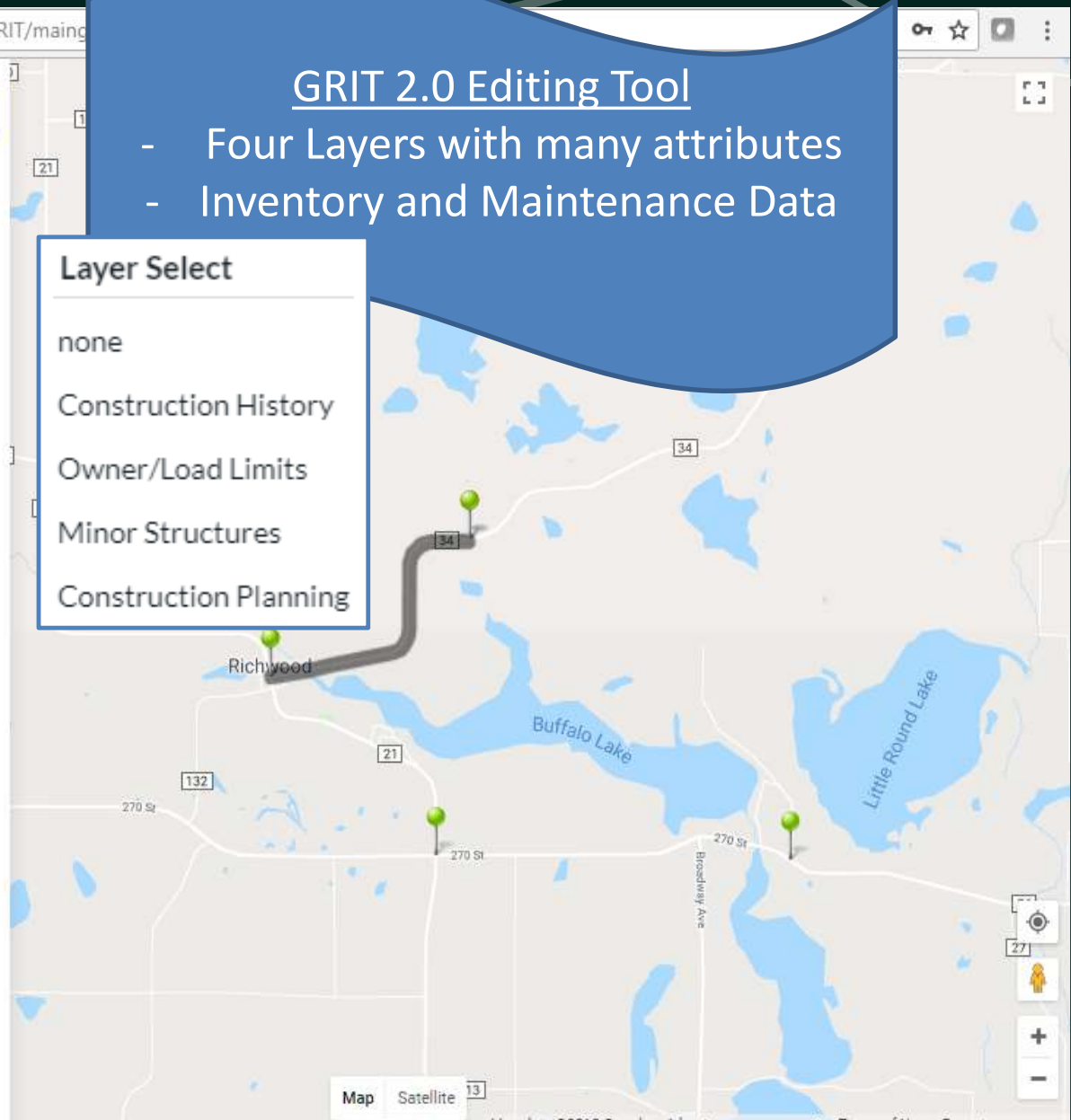
none

Construction History

Owner/Load Limits

Minor Structures

Construction Planning



Not secure | dotsc.ugpti.ndsu.nodak.edu/GRIT/maing

Layers

Callaway

Construction History	Construction Planning	Bridges	Load Restrictions	Maintenance
Location	Location	Location	Location	Const History
Highway	Highway	Highway	Highway	Segments
Surface Type	Project Type	Type	Owner	Bituminous
Proj Type	Project #	Material	Func. Class	Seal Coat
LP Year	Planned Year	Span	Maintenance	Crack Seal
LP Depth	Status	Cell Diameter	Road Type	Patching
Total Depth	Bid Open Date	Cell Width	Seas. Load Limit	Striping
Base Type	Cost	Cell Height	Seas. Gross Lmt	Year
Base Depth	Start Date	Length	Yr Rnd Limit	Cost
Base Year	Public Impact	Year Installed	Yr Rnd Gross	Gravel
Base Treatment	Restrictions	Cover Depth		Blading
SubGrd Strength	Detour	Replace Cost		Regravel
Treatment	Comments	Condition		Reshape
Lane Width	Funding Srce	Rating Date		Spot Repair
Shoulder Width	Funding Splits	GVW Limit		Dust Control
Grade Year	Fund Commit	Axle Limit		Frequency
Striping				Cost
Rumble Strips				Concrete
Curbs				Cracks
Inslope				CPR
ROW				Cost
Owner				

Construction History

Location

Last Project Surface

Last Project Type

Overlay

Last Project Surface

Bituminous

Bituminous Type

Hot Bituminous (Class 2)

Last Project Year

1999

Last Project Surface Depth

3.50

Total Surface Depth (inches)

5.00

New Edit Cancel

Location Editing for all layers

- Just a Start and End Point
- A few simple tools ie Snapping

Layers

Construction History Inventory

Location Last Project Surface Base Cross Section

Highway Number
34 Length: 1.60 Miles

Start Location
46.9737720, -95.8227330

End Location
46.9843660, -95.7995270

Waypoints

Segment Description
Segment Description

Convert To PolyLine

New Save Delete Cancel

Click to snap. X
Snap

Map Satellite

Map data ©2018 Google 1 km Terms of Use Report a map error

Construction History - Inventory

- Last Project Surface TAB
- Surfacing, Type, Year, etc

The screenshot displays a web application interface for managing construction history. On the left, a sidebar contains a 'Construction History' section with a dropdown menu set to 'Inventory'. Below this, there are several filter tabs: 'Location', 'Last Project Surface', 'Base', and 'Cross Section'. The 'Last Project Surface' tab is active, showing a list of filters with dropdown menus and green arrow icons for selection:

- Last Project type: Not Selected
- Last Project Surface: Bituminous
- Bituminous Type: Not Selected
- Last Project Year: 2017
- Last Project Surface Depth (Inches): 4.00
- Total Surface Depth (Inches): Not Selected

At the bottom of the sidebar are three buttons: 'New' (blue), 'Edit' (green), and 'Cancel' (grey). The main area of the interface is a map showing a road network. A road segment is highlighted in dark grey, and several location markers (green and red) are placed along the road. The map includes labels for 'Little Round Lake', 'Rock Lake', and 'Brazosway Ave'. The bottom of the map shows 'Map' and 'Satellite' options, along with a scale bar and a 'Report a map error' link.

Layers

Construction History Maintenance

Gravel

Blade Regravel Reshape SpotRep DustControl

Blade

1 of 1 New Delete

Year 2017

Cost Per Mile 160

Times per Year 40

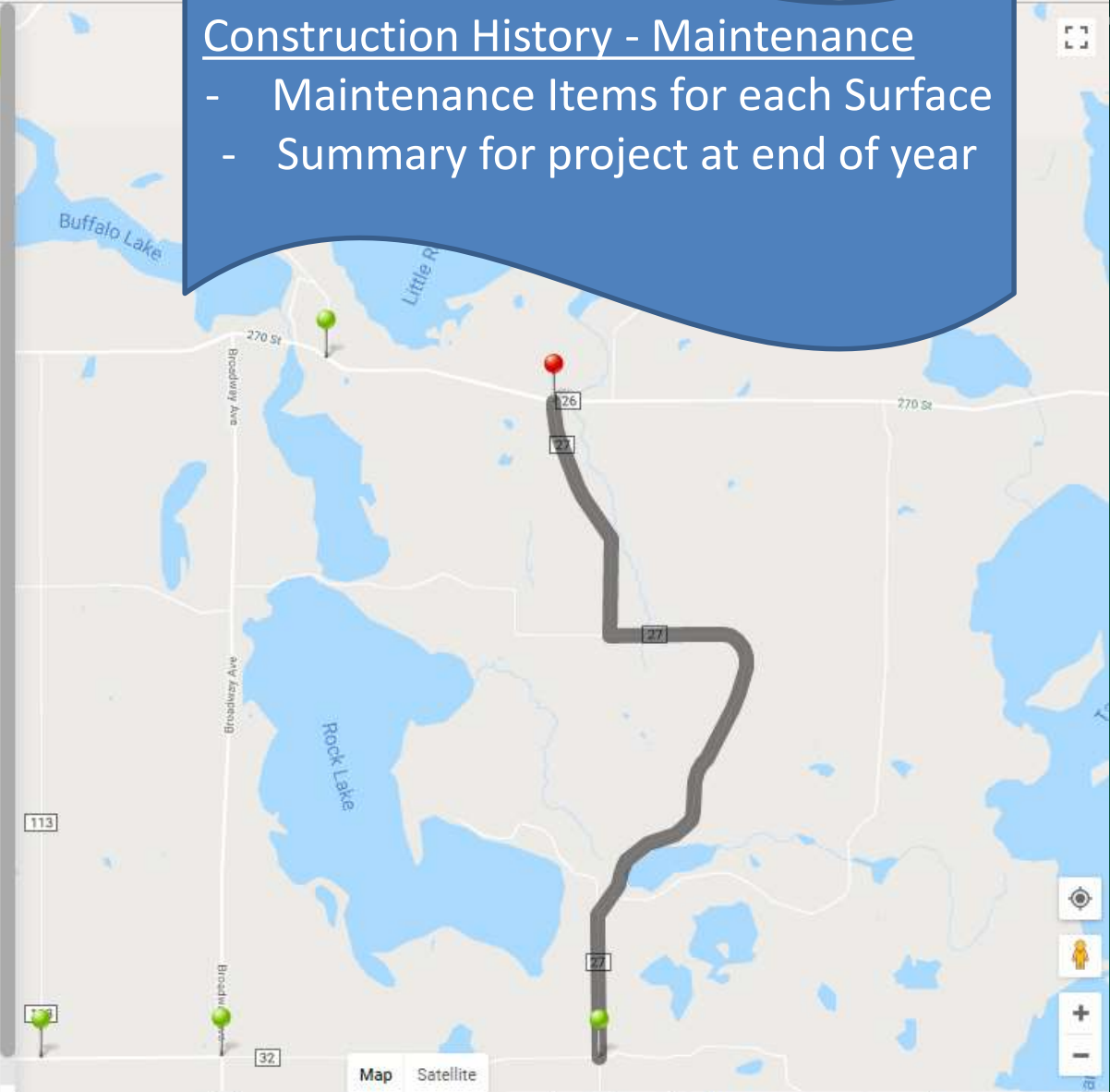
With Roller Yes

Completed By Contractor

New Edit Cancel

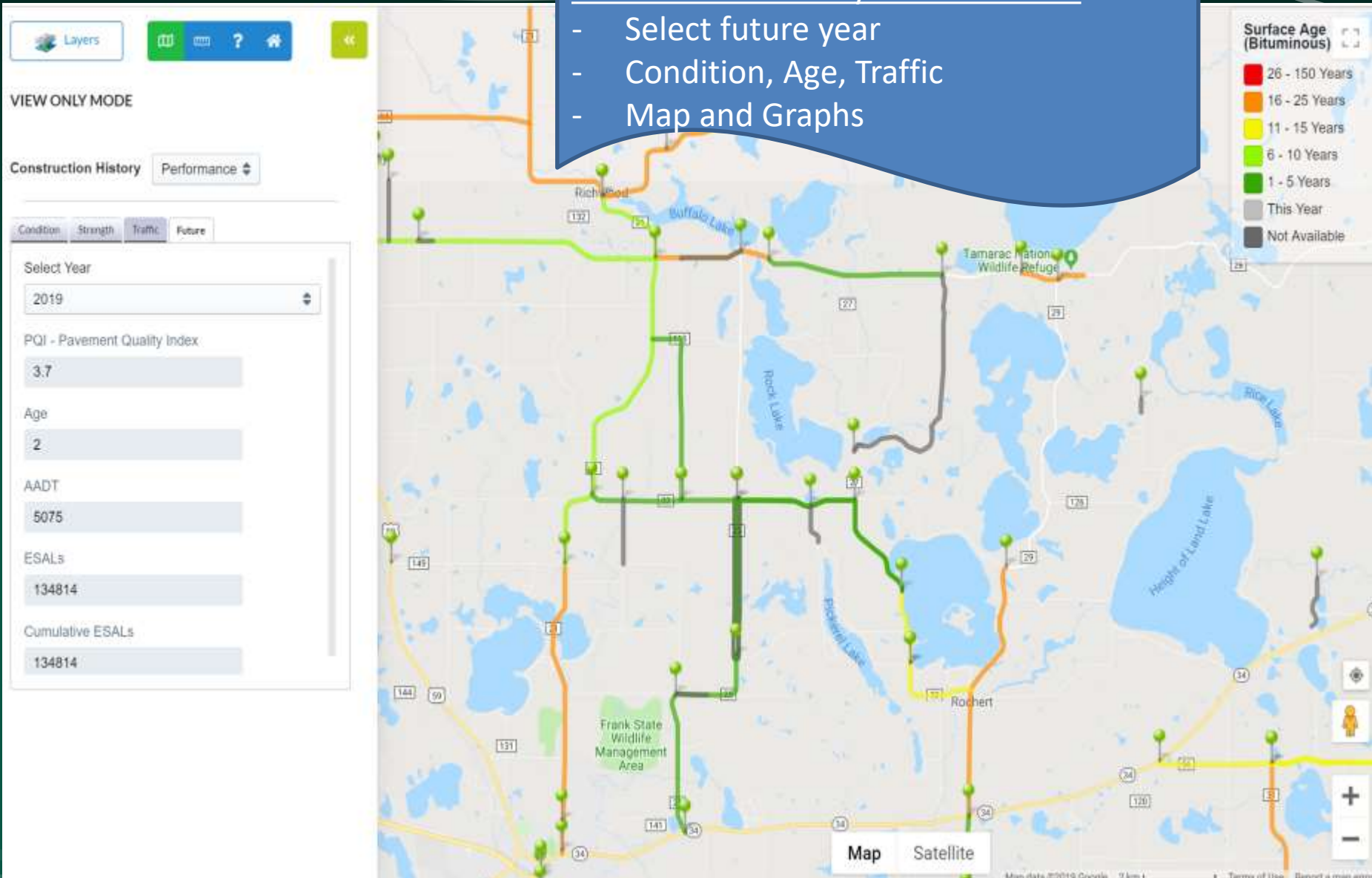
Construction History - Maintenance

- Maintenance Items for each Surface
- Summary for project at end of year



Construction History - Performance

- Select future year
- Condition, Age, Traffic
- Map and Graphs



Construction Planning layer

- Location – longer roads
- Improvements and Impacts

Construction Planning

Location Project Info Public Impacts Finance

Type
Mine & Blend

Surfacing
Bituminous

Thickness (inches)
3.5

Project Number
Text input

Planned Year
2020

Project Status
Planned

New Edit Cancel

Planned Improvements

- Construction
- Overlay
- Surfacing
- Mine & Blend
- Bridge Rehab
- Bridge Replacement
- Maintenance
- Safety
- Other
- Not Available

Map Satellite

Minor Structures layer

- Location – point and flow
- Age, Dimensions, Condition, Restrictions

Layers

Minor Structures

Location Structure Condition Signing

Type
Pipe Culvert

Material
Steel

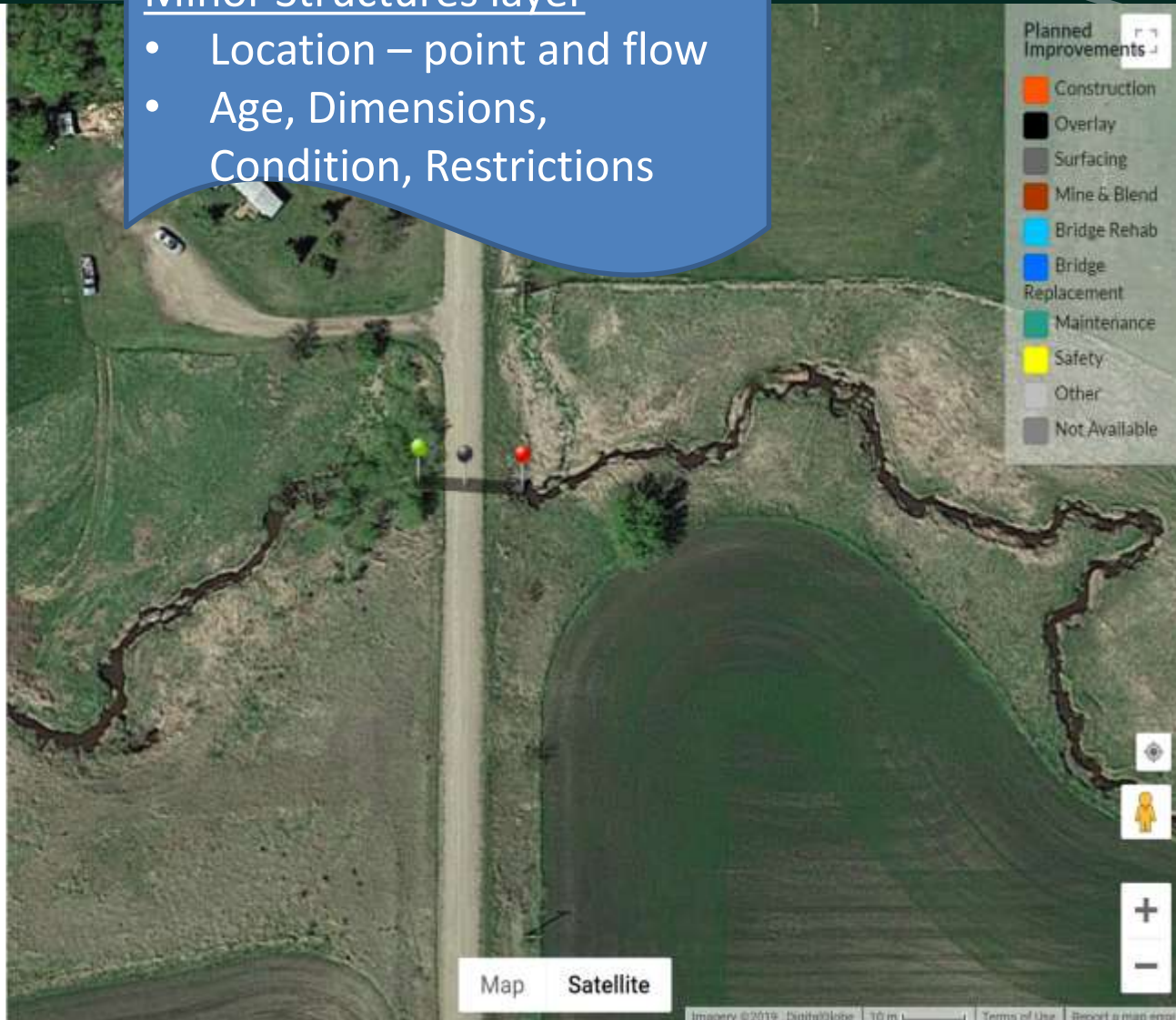
Span Length (ft)
100

Cell Diameter (ft)
6

Cell Width (ft)
0

Cell Height (ft)
0

New Edit Cancel



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Selection Tool, Grain Industry
Data, etc.*)

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Geographic Roadway Inventory Tool (GRIT) WebMap Viewers

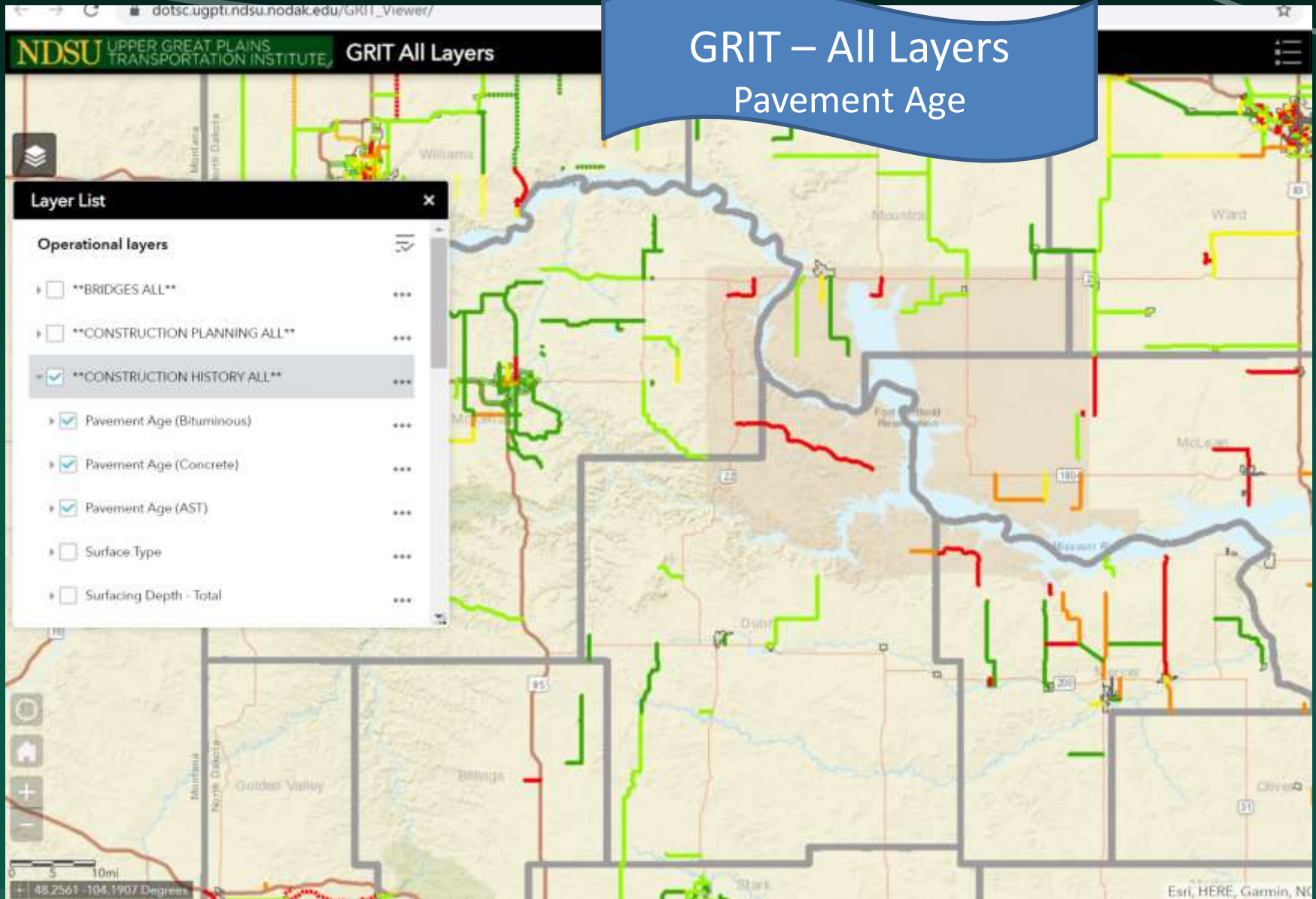
The following webmap links were created to view various information as entered into the GRIT database. These webmap viewers will be updated and changed based on feedback from the Counties using them. Additional viewers will also be added to this list based on feedback. All data shown in these viewers is entered and maintained by the responsible County or City through the GRIT Editor Program. The Upper Great Plains Transportation Institute and North Dakota State University make no representation or warranty, expressed or implied, regarding the accuracy or reliability of the data displayed.

Web Maps

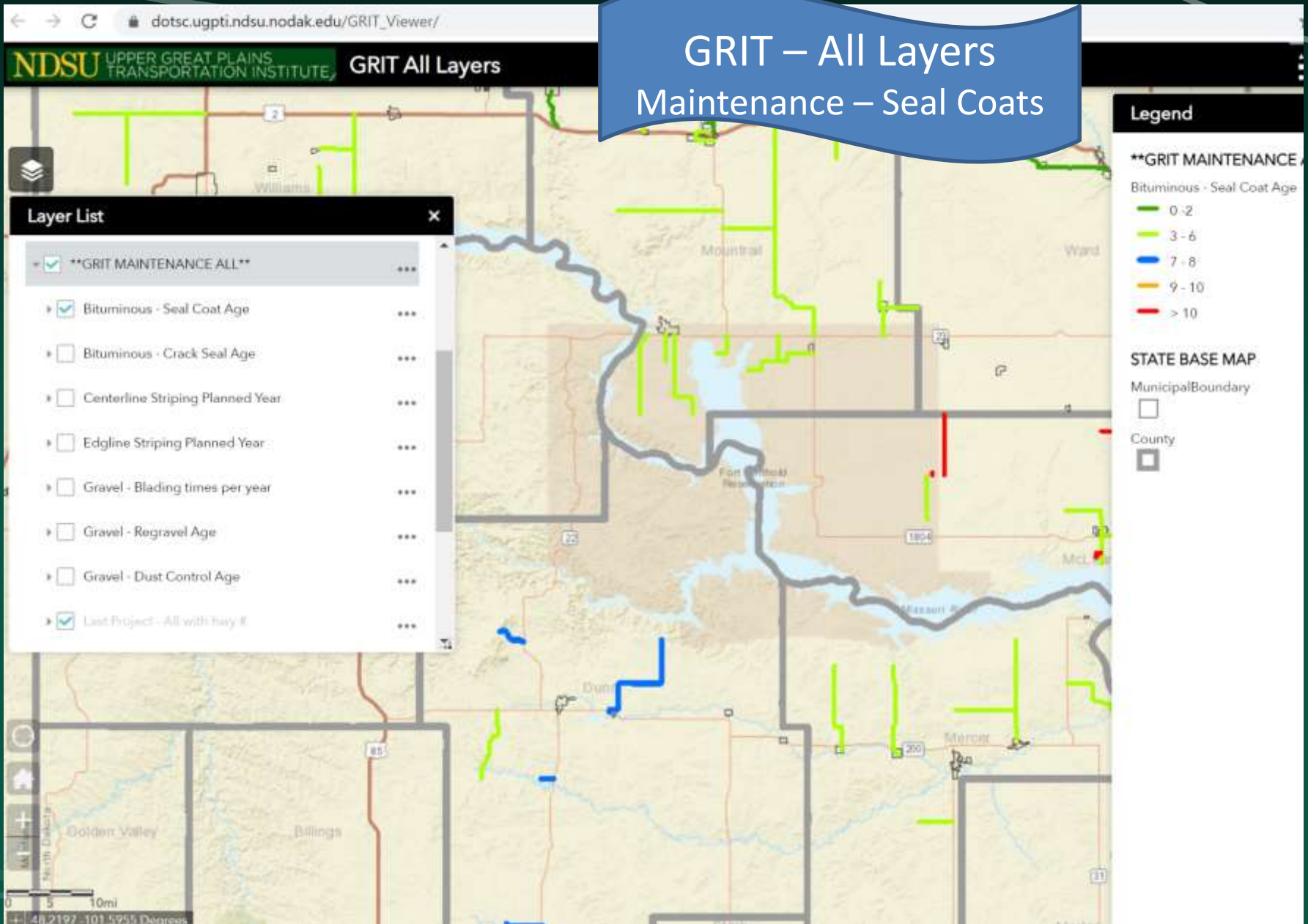
- [GRIT Viewer – All Layers – ND](#)
- [GRIT Viewer – All Layers – MN](#)
- [Load Restrictions – All Roads](#)
- [Construction-Maintenance-Emergency Travel Impacts](#)
- [Pavement Condition Forecasting](#)

GRIT Dashboards

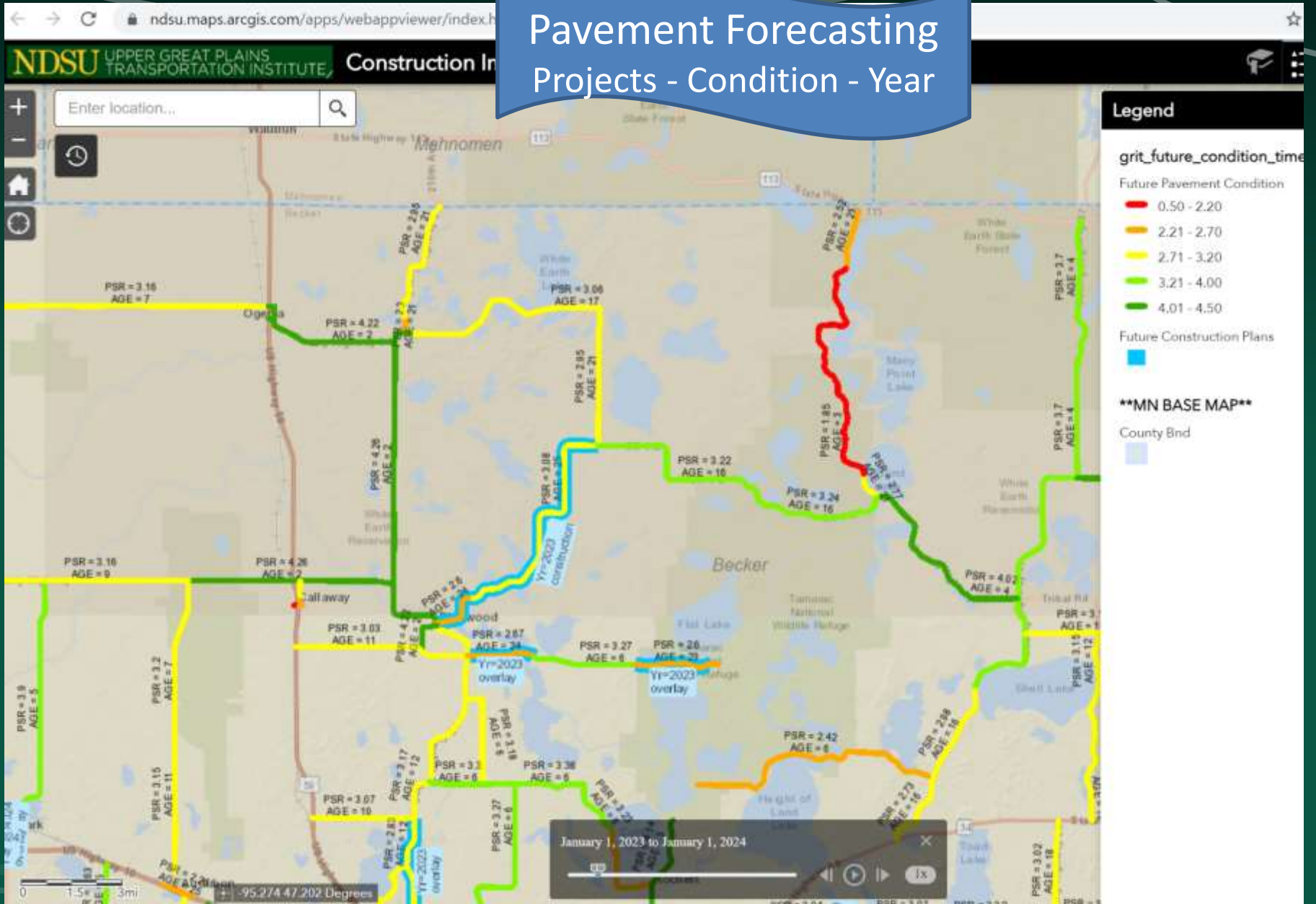
- [ND County Crash Dashboard](#)
- [Pavement Performance Forecasting](#)
- [Minor Structures Dashboard](#)



GRIT – All Layers Maintenance – Seal Coats



Pavement Forecasting Projects - Condition - Year



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Web Maps

- [GRIT Viewer – All Layers – ND](#)
- [GRIT Viewer – All Layers – MN](#)
- [Load Restrictions – All Roads](#)
- [Construction-Maintenance-Emergency Travel Impacts](#)
- [Pavement Condition Forecasting](#)

GRIT Dashboards

- [ND County Crash Dashboard](#)
- [Pavement Performance Forecasting](#)
- [Minor Structures Dashboard](#)

Dashboards

Pavement Forecasting

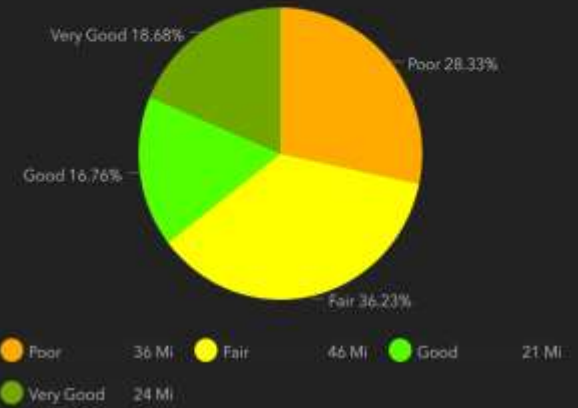
GRIT Performance Forecasting Dashboard

Select County:
Ramsey

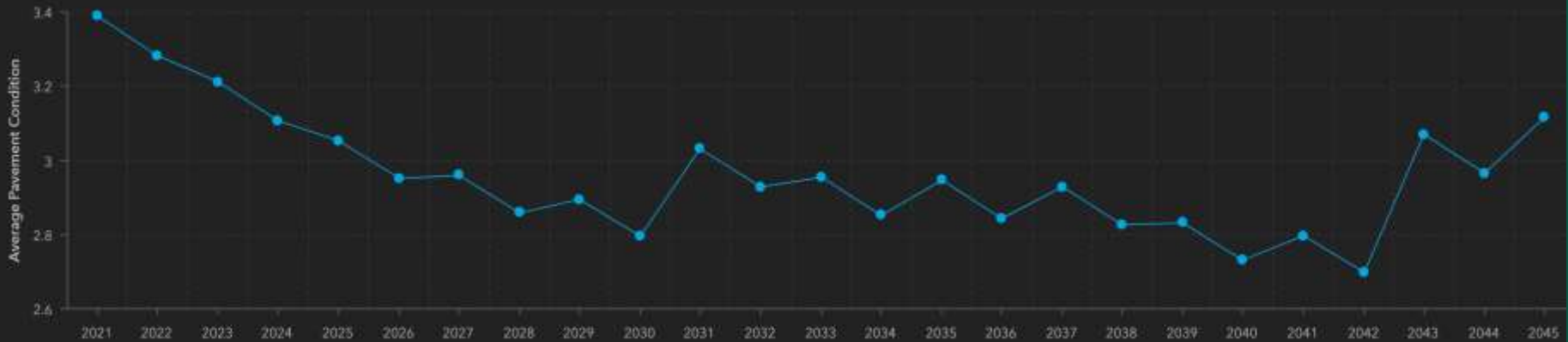
Select Year:
2024



Pavement Condition Mileage for selected Year



Condition Age AADT



Condition Age Est. Cost Improvement Miles

Dashboards

Pavement Forecasting

GRIT Performance Forecasting Dashboard

Select County:
Fort Berthold

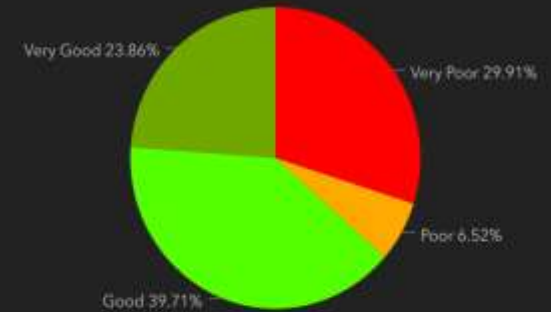
Select Year:
2021



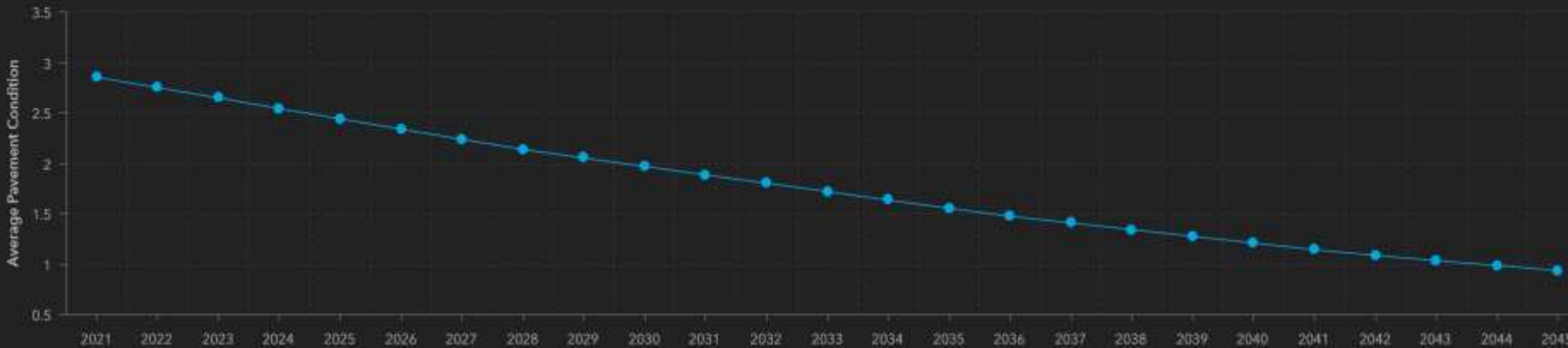
State of North Dakota, Esri, Canada, Esri, HERE, Garmin, SafeGraph, FAO, MET/NASA, USGS, EPA, NPS

Powered by Esri

Pavement Condition Mileage for selected Year



Condition Age AADT



Condition Age Est. Cost Improvement Miles

Dashboards Bridges and Culverts

SELECT County
Ramsey

Type
All

Material
All

Condition
All

Age
All

Span
0 feet +

Number of Cells
All

Cell Diameter
0.0 feet +

Cell Length
0 feet +

Selected Structures - 190
Average Age - 25.8

Total Replacement Costs - 4M

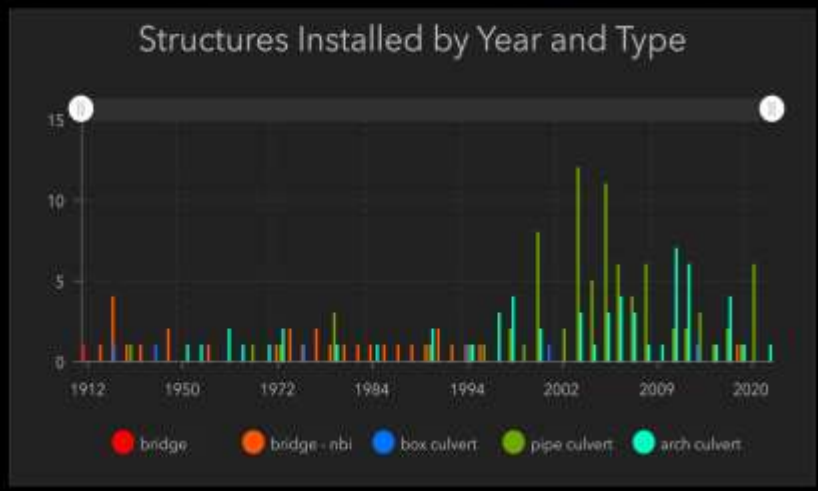
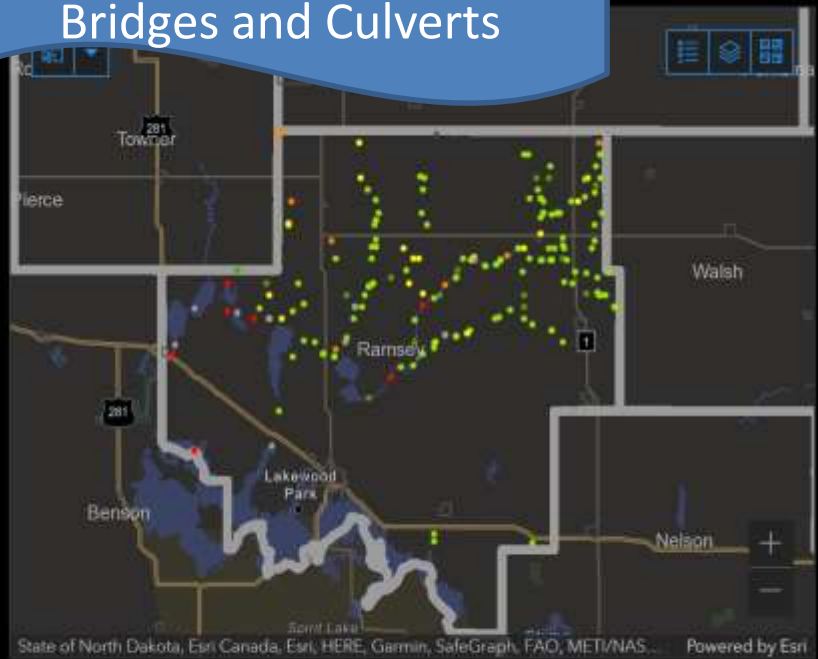
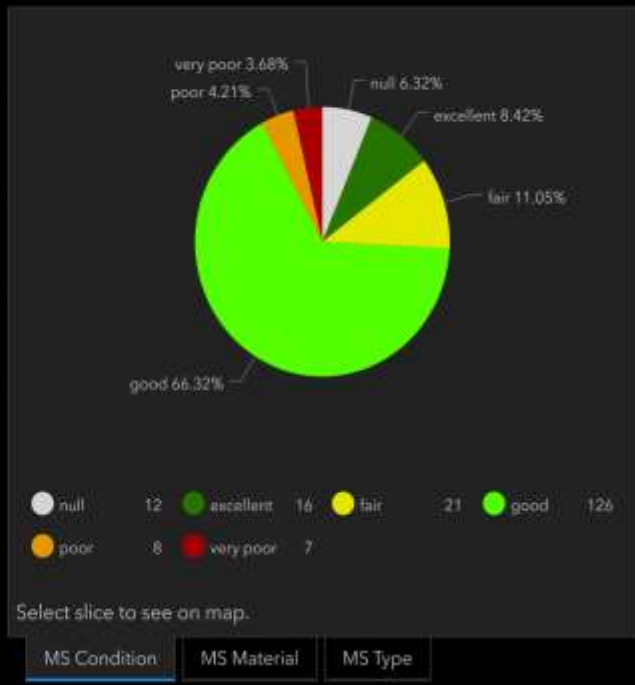
Age (1 to 10 Years) - 39 or 21%

Age (21 to 40 Years) - 40 or 21%

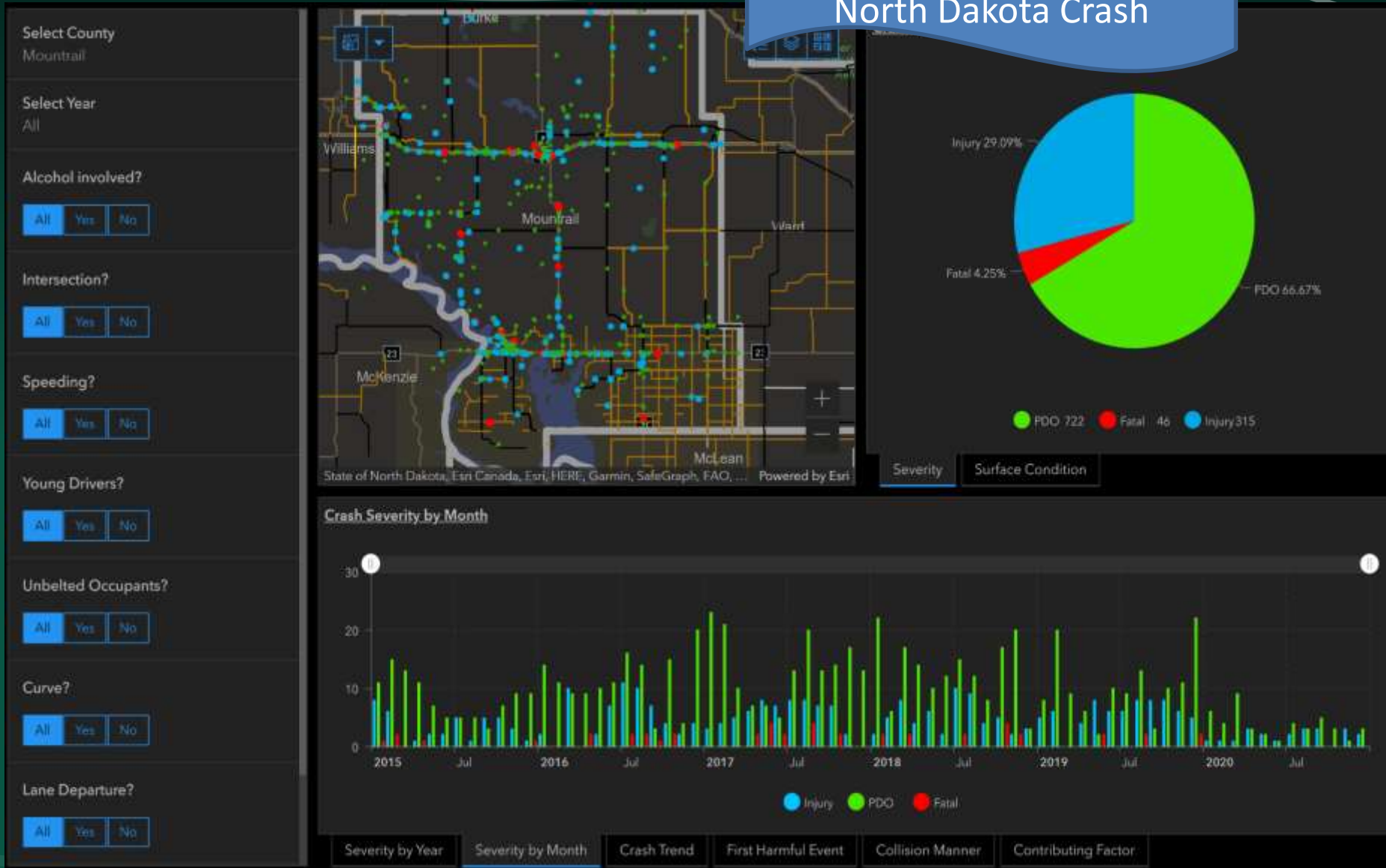
Age (41 to 100 Years) - 36 or 19%

Age (No Data) - 13 or 7%

Replacement Cost (No Data) - 97 or 51%

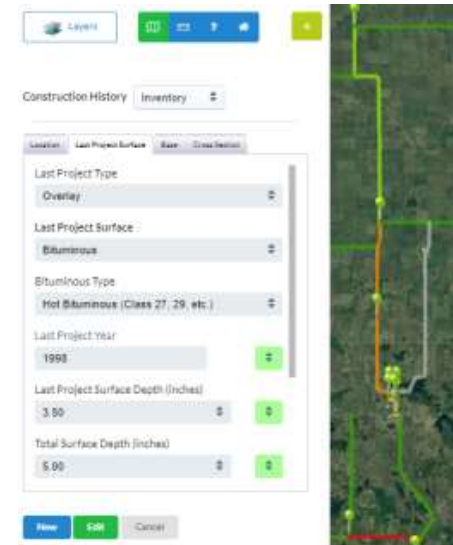


Dashboards North Dakota Crash



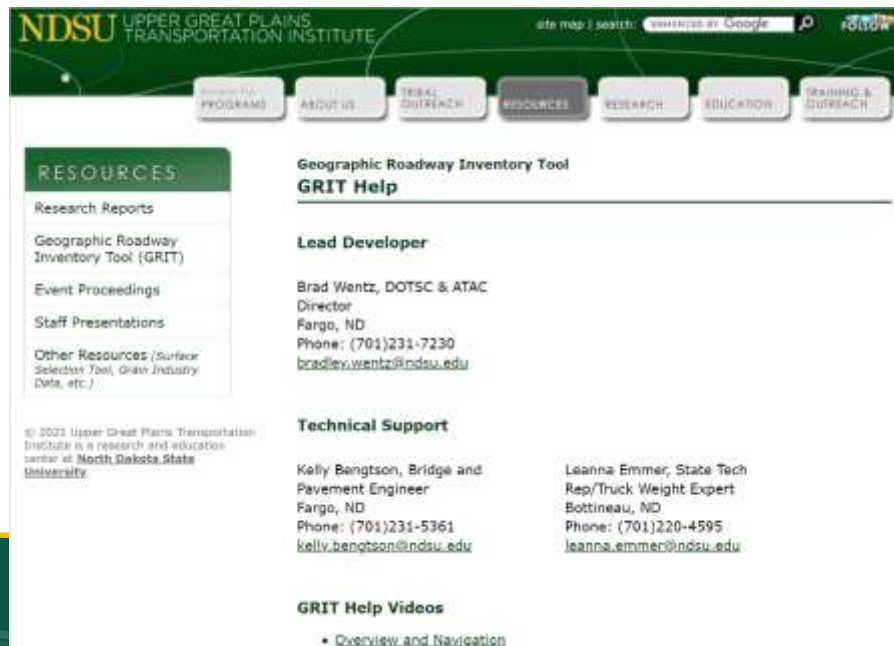
Summary of TAM with GRIT

- Anybody can do it – Easy to use
- Initial data entry fairly quick
 - Hardest part is finding data
- Updates each year are simple
- Enter Planning projects
- Automatic Forecasting
- Web Maps & Dashboards
- Easy to use tools to efficiently manage assets.



How do I get this?

- Explore it at <https://www.ugpti.org/resources/asset-inventory/>
- Available to all ND Counties and Tribal Nations
- Also available to MN, MT, and SD Local Governments by request
- Unlimited users and will work on any device
- Contact UGPTI if you would like to try it out



The screenshot shows the website for the NDSU Upper Great Plains Transportation Institute. The header includes the NDSU logo and navigation tabs for PROGRAMS, ABOUT US, TRIBAL OUTREACH, RESOURCES (highlighted), RESEARCH, EDUCATION, and TRAINING & OUTREACH. The main content area is titled "Geographic Roadway Inventory Tool GRIT Help". It lists the lead developer, Brad Wentz, and technical support contacts: Kelly Bengtson and Leanna Emmer. A sidebar on the left lists various resources, and a footer contains copyright information and a link to GRIT Help Videos.

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site map | search:

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- Research Reports
- Geographic Roadway Inventory Tool (GRIT)
- Event Proceedings
- Staff Presentations
- Other Resources (Surface Selection Tool, Great Industry Data, etc.)

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**Geographic Roadway Inventory Tool
GRIT Help**

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Leanna Emmer, State Tech Rep/Truck Weight Expert
Bottineau, ND
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leanna.emmer@ndsu.edu

GRIT Help Videos

- Overview and Navigation

Asset Management with GRIT

2021 Great Plains Tribal Transportation Workshop



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