

NDSU UPPER GREAT PLAINS
TRANSPORTATION INSTITUTE

Response to Data Request for HB 1147

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Overview

- Summary of overall statewide needs study
- Bridge condition ratings, analysis, and results
- Walkthrough data request from Rep. Thomas
 - County qualification and distribution under current bill language

County, Township and Tribal Road and Bridge Needs Study

Objective: estimate the 20-year needs to maintain North Dakota's County, Township, and Tribal roads and bridges

- Correct deficiencies to maintain and improve the condition
- Does not include system-wide enhancement, i.e. paving gravel roads

Bridge Condition Ratings

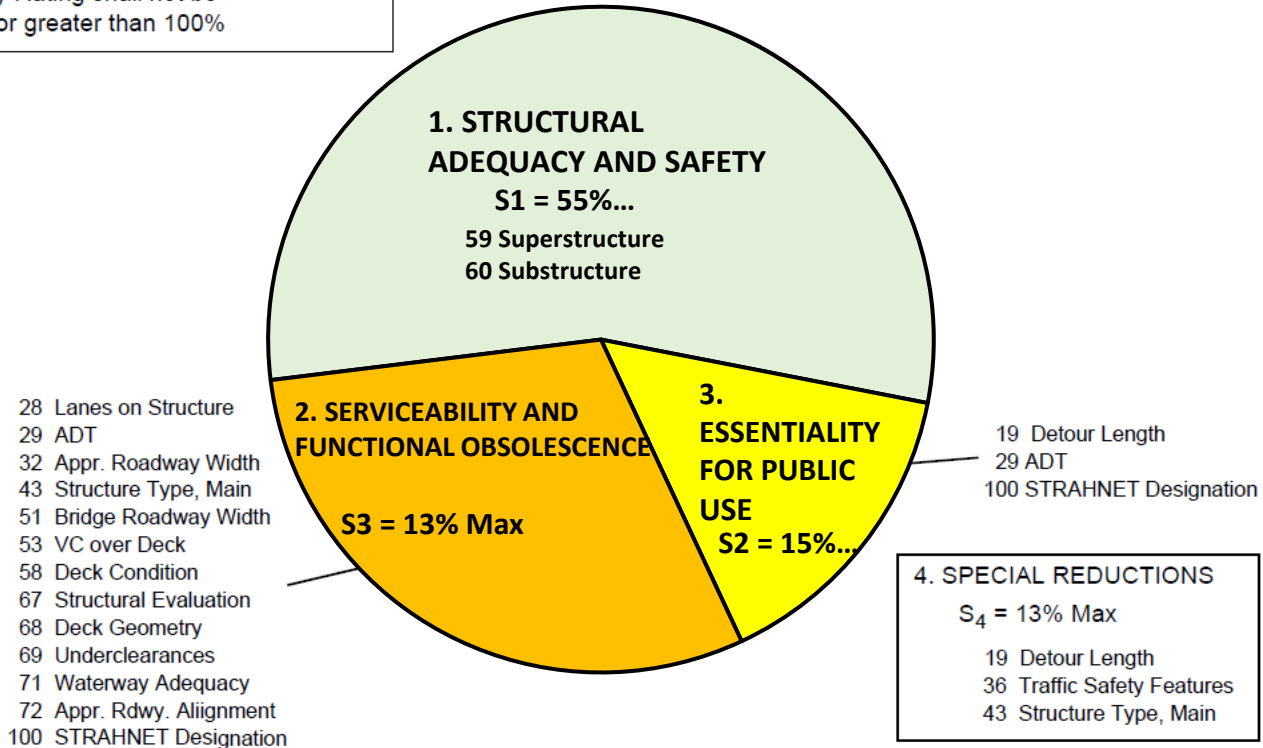
- Primary Data Source – National Bridge Inventory System (NBIS)
 - Contained data from 2020-2021 bridge safety inspections
 - Historically, the Sufficiency Rating (SR) was used to assign a condition rating to bridges considering a multitude of factors (0-100 scale)
 - NBIS stopped tracking this metric and many states have been developing their own guidelines
 - UGPTI had developed a SR calculator which was updated to include special reduction factors
 - The Bridge Needs Target (BNT) was developed to replace SR
 - Advisory panel consisting of ND County officials

Bridge Sufficiency Rating Calculation Worksheet

Ref: 'Recording and Coding Guide for the Structural Inventory and Appraisal of the Nation's Bridges', Report No. FHWA-PD-96-001

$$\text{SUFFICIENCY RATING} = S_1 + S_2 + S_3 - S_4$$

Sufficiency Rating shall not be less 0% nor greater than 100%



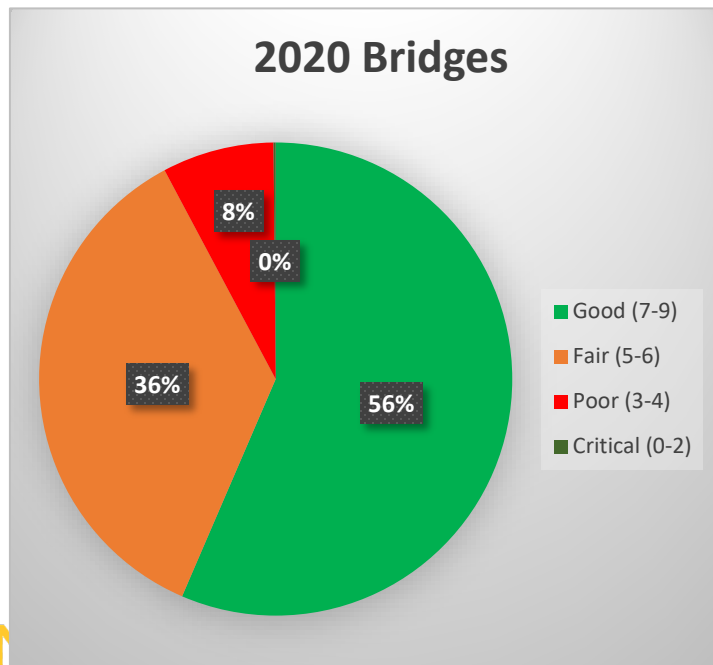
Bridge Needs Target

- The Bridge Needs Target (BNT) was developed to replace SR
 - Advisory panel consisting of ND County officials
 - Replacement for SR
 - Special Reduction Factors
 - Classified as fracture critical
 - Posted for load
 - Timber materials
 - Susceptible to scour
 - Replacement Criteria
 - BNT<75

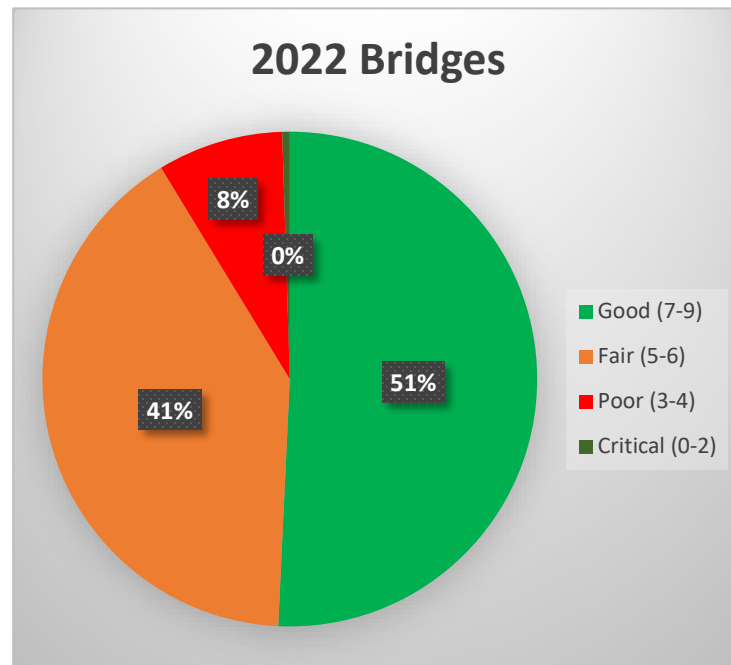
| County | Advisor |
|-------------|----------------|
| Bottineau | Ritch Gimbel |
| Bowman | Shane Biggs |
| Cass | Jason Benson |
| Grand Forks | Nick West |
| Lamoure | Josh Loegering |
| McKenzie | Suhail Kanwar |
| Morton | John Saiki |
| Sargent | Tim Faber |
| Stark | Al Heiser |
| Ward | Dana Larsen |

ND Local Bridge Conditions

Based on 2019 NBI data



Based on 2021 NBI data



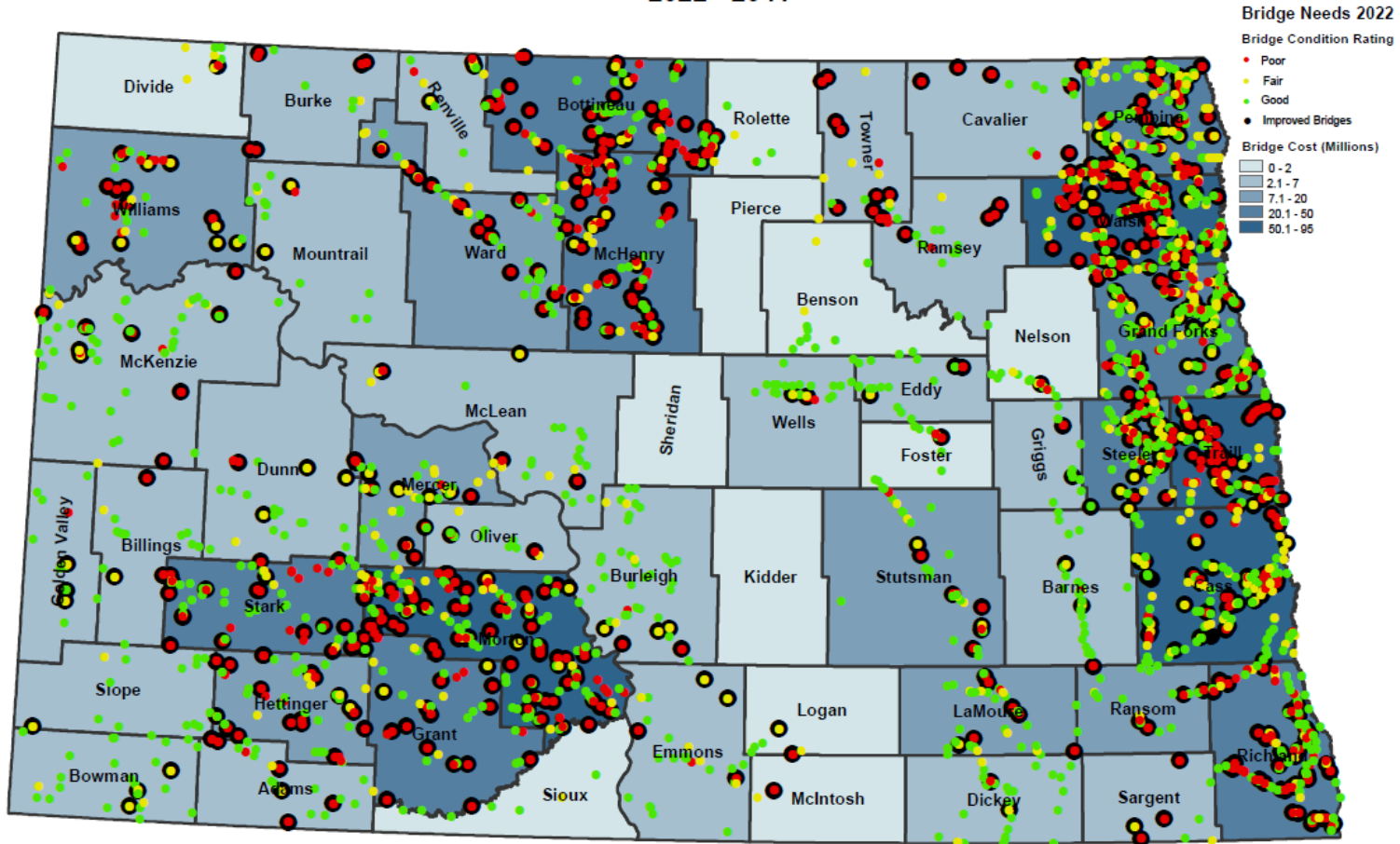
Analysis Logic

- BNT<75 – Replacement
- Repair and Rehabilitation
 - This has been removed as local governments have moved toward replacing bridges that are in poor condition
 - Maintenance needs provide for an offset
- Preventive Maintenance
 - Deck washing, deck and crack sealing, joint maintenance, ice control costs

Results

| Period | Replacement | Maintenance | Total |
|-----------|-------------|-------------|----------|
| 2022-2023 | \$134.19 | \$5.23 | \$139.42 |
| 2024-2025 | \$134.19 | \$5.23 | \$139.42 |
| 2026-2027 | \$134.19 | \$5.23 | \$139.42 |
| 2028-2029 | \$134.19 | \$5.23 | \$139.42 |
| 2030-2031 | \$134.19 | \$5.23 | \$139.42 |
| 2032-2041 | \$17.76 | \$0.69 | \$18.45 |
| 2022-2041 | \$688.72 | \$26.85 | \$715.57 |

Projected Bridge Costs 2022 - 2041



Data Request Related to HB 1147

- Section 3: Grants to Counties
 - Qualification: The individual county need as a proportion of the statewide total multiplied by \$100,000,000 must exceed \$500,000 (Spreadsheet 1)

| Spreadsheet 1 - Section 3 Qualification | | | | | | | | HB 1147 | |
|---|------------------|---|---------------|------------------|----------------------|---------------------|----------------------------------|-------------------|---|
| County | Bridges Replaced | UGPTI Study Results 20-Year Bridge Needs | | | Replacement County % | Total Cost County % | Does share x \$100M > \$500,000? | | (1) Yes, (0) No Meets >\$500K Threshold |
| | | Replacement Cost | PM Cost | Total Cost | | | Replacement % x \$100 M | Total % x \$100 M | |
| Adams | 7 | \$ 5,368,480.61 | \$ 312,428.51 | \$ 5,680,909.13 | 0.78% | 0.79% | \$ 779,488.36 | \$ 793,897.25 | 1 |
| Barnes | 2 | \$ 6,018,876.05 | \$ 530,210.10 | \$ 6,549,086.14 | 0.87% | 0.92% | \$ 873,923.95 | \$ 915,223.49 | 1 |
| Benson | 0 | \$ - | \$ 97,419.98 | \$ 97,419.98 | 0.00% | 0.01% | \$ - | \$ 13,614.27 | 0 |
| Billings | 3 | \$ 2,949,187.07 | \$ 273,865.71 | \$ 3,223,052.78 | 0.43% | 0.45% | \$ 428,213.71 | \$ 450,416.06 | 0 |
| Bottineau | 41 | \$ 34,098,385.38 | \$ 663,941.39 | \$ 34,762,326.77 | 4.95% | 4.86% | \$ 4,950,990.10 | \$ 4,857,975.18 | 1 |
| Bowman | 4 | \$ 2,579,150.62 | \$ 198,452.13 | \$ 2,777,602.75 | 0.37% | 0.39% | \$ 374,485.45 | \$ 388,165.19 | 0 |
| Burke | 5 | \$ 2,250,000.00 | \$ 48,020.00 | \$ 2,298,020.00 | 0.33% | 0.32% | \$ 326,693.70 | \$ 321,144.33 | 0 |
| Burleigh | 7 | \$ 5,133,819.24 | \$ 464,724.38 | \$ 5,598,543.61 | 0.75% | 0.78% | \$ 745,416.18 | \$ 782,386.81 | 1 |

Data Request Related to HB 1147

- Section 3: Grants to Counties
 - Amount: The individual county need as a proportion of the statewide total for qualifying counties multiplied by \$80,000,000 (Spreadsheet 2)

| Spreadsheet 2 - Section 3 Amounts | | | | | | | | HB 1147 | |
|-----------------------------------|------------------|---|-----------------|------------------|------------------------|---------------------|-----------------------------|------------------|--|
| County | Bridges Replaced | UGPTI Study Results 20 Year Bridge Needs | | | \$80M Qualified County | | Qualified County Proportion | | |
| | | Replacement Cost | PM Cost | Total Cost | Replacement County % | Total Cost County % | Replacement % x \$80 M | Total % x \$80 M | |
| Adams | 7 | \$ 5,368,480.61 | \$ 312,428.51 | \$ 5,680,909.13 | 0.82% | 0.83% | \$ 653,379.00 | \$ 667,121.61 | |
| Barnes | 2 | \$ 6,018,876.05 | \$ 530,210.10 | \$ 6,549,086.14 | 0.92% | 0.96% | \$ 732,536.36 | \$ 769,073.54 | |
| Bottineau | 41 | \$ 34,098,385.38 | \$ 663,941.39 | \$ 34,762,326.77 | 5.19% | 5.10% | \$ 4,149,995.24 | \$ 4,082,216.21 | |
| Burleigh | 7 | \$ 5,133,819.24 | \$ 464,724.38 | \$ 5,598,543.61 | 0.78% | 0.82% | \$ 624,819.19 | \$ 657,449.25 | |
| Cass | 43 | \$ 64,506,553.72 | \$ 3,371,424.63 | \$ 67,877,978.35 | 9.81% | 9.96% | \$ 7,850,867.07 | \$ 7,971,059.75 | |
| Cavalier | 6 | \$ 4,106,269.58 | \$ 130,460.49 | \$ 4,236,730.07 | 0.62% | 0.62% | \$ 499,759.71 | \$ 497,528.50 | |

in Spreadsheet 3

Data Request Related to HB 1147

- Section 4: County and Township Bridge Fund – NDDOT
 - Needs for counties not qualified under Section 3 are presented in Spreadsheet 3

| Spreadsheet 3 - Section 4 County Needs | | HB 1147 | | |
|--|------------------|----------------------|---------------|-----------------|
| County | Bridges Replaced | UGPTI Study Results | | |
| | | 20-Year Bridge Needs | | |
| | | Replacement Cost | PM Cost | Total Cost |
| Benson | 0 | \$ - | \$ 97,419.98 | \$ 97,419.98 |
| Billings | 3 | \$ 2,949,187.07 | \$ 273,865.71 | \$ 3,223,052.78 |
| Bowman | 4 | \$ 2,579,150.62 | \$ 198,452.13 | \$ 2,777,602.75 |
| Burke | 5 | \$ 2,250,000.00 | \$ 48,020.00 | \$ 2,298,020.00 |
| Dickey | 2 | \$ 2,617,436.49 | \$ 565,363.70 | \$ 3,182,800.19 |
| Divide | 1 | \$ 450,000.00 | \$ 78,709.49 | \$ 528,709.49 |

Questions?

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The full study report can be found at:

www.ugpti.org