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NORTH
Dakota
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2024
NORTH DAKOTA TRAVEL GUIDE
HELLO
FRIENDS

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NDDOT Mission: Safely Move People and Goods


GRATITUDE

- Our Why
  - Safety First
    - Get everyone home safely
  - Prevention focus
    - Prevent loss of equipment
    - Prevent loss of product
    - Prevent loss of infrastructure
  - Preservation
    - Extend the useful life of existing infrastructure

BRIDGE INSPECTION PROGRAM

- National Bridge Inspection Standards (NBIS)
- 23 CFR Part 650
- 23 Metrics
- Manual for Bridge Evaluation (MBE)

23 METRICS

- Metric #1: Bridge Inspection Organization
- Metric #2: Qualifications of Personnel – Program Manager
- Metric #3: Qualifications of Personnel – Team Leader(s)
- Metric #4: Qualifications of Personnel – Load Rating Engineer
- Metric #5: Qualifications of Personnel – UW Bridge Inspection Diver
- Metric #6: Inspection Frequency – Routine – Lower risk bridges
- Metric #7: Inspection Frequency – Routine – Higher risk bridges
- Metric #8: Inspection Frequency – Underwater – Lower risk bridges
- Metric #9: Inspection Frequency – Underwater – Higher risk bridges
- Metric #10: Inspection Frequency – Fracture Critical Member
- Metric #11: Inspection Frequency – Frequency criteria
- Metric #12: Inspection Procedures – Quality Inspections

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- Metric #14: Inspection Procedures – Post or Restrict
- Metric #15: Inspection Procedures – Bridge Files
- Metric #16: Inspection Procedures – Fracture Critical Members
- Metric #17: Inspection Procedures – Underwater
- Metric #18: Inspection Procedures – Scour
- Metric #19: Inspection Procedures – Complex Bridges
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- Metric #23: Inventory – Timely Updating of Data

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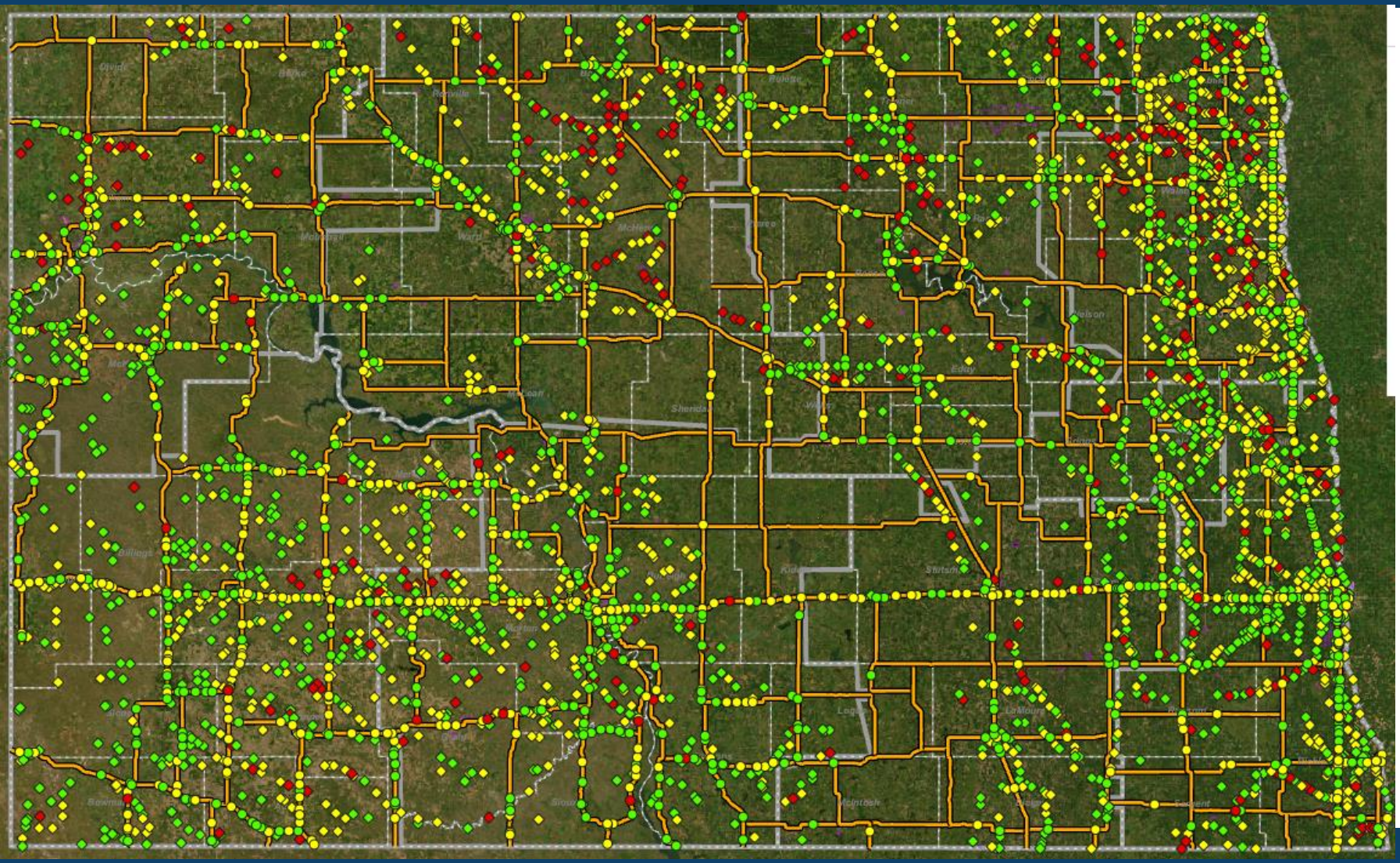
NORTH DAKOTA BRIDGE INVENTORY



State Bridges

State Bridge Count

1,723

Deck Area

8,832,267 sq ft

Non-State Bridges

Non-State Bridge Count

3,062

Deck Area

5,828,457 sq ft

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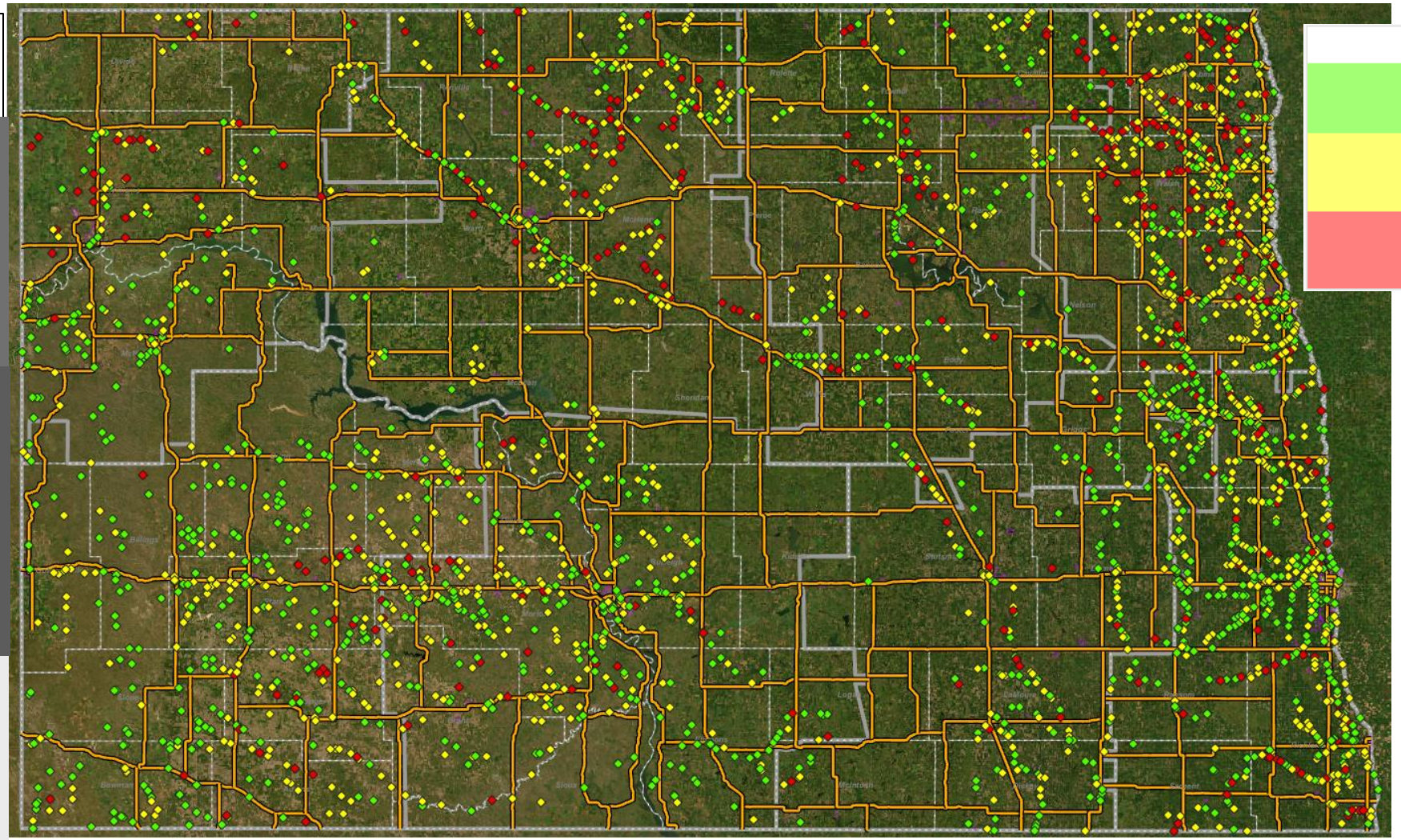
LOCALLY OWNED BRIDGE INVENTORY

Percent by Deck Area

Good

Fair

Poor



Non-State Bridges

Good: 1,228
Deck Area: 2,873,804 sq ft

Fair: 1,387
Deck Area: 2,427,235 sq ft

Poor: 447
Deck Area: 527,418 sq ft

Source: ND Bridge Condition Map

https://experience.arcgis.com/experience/a13bf5624b7f4882a4d050c1904358cf/page/All-Bridges/

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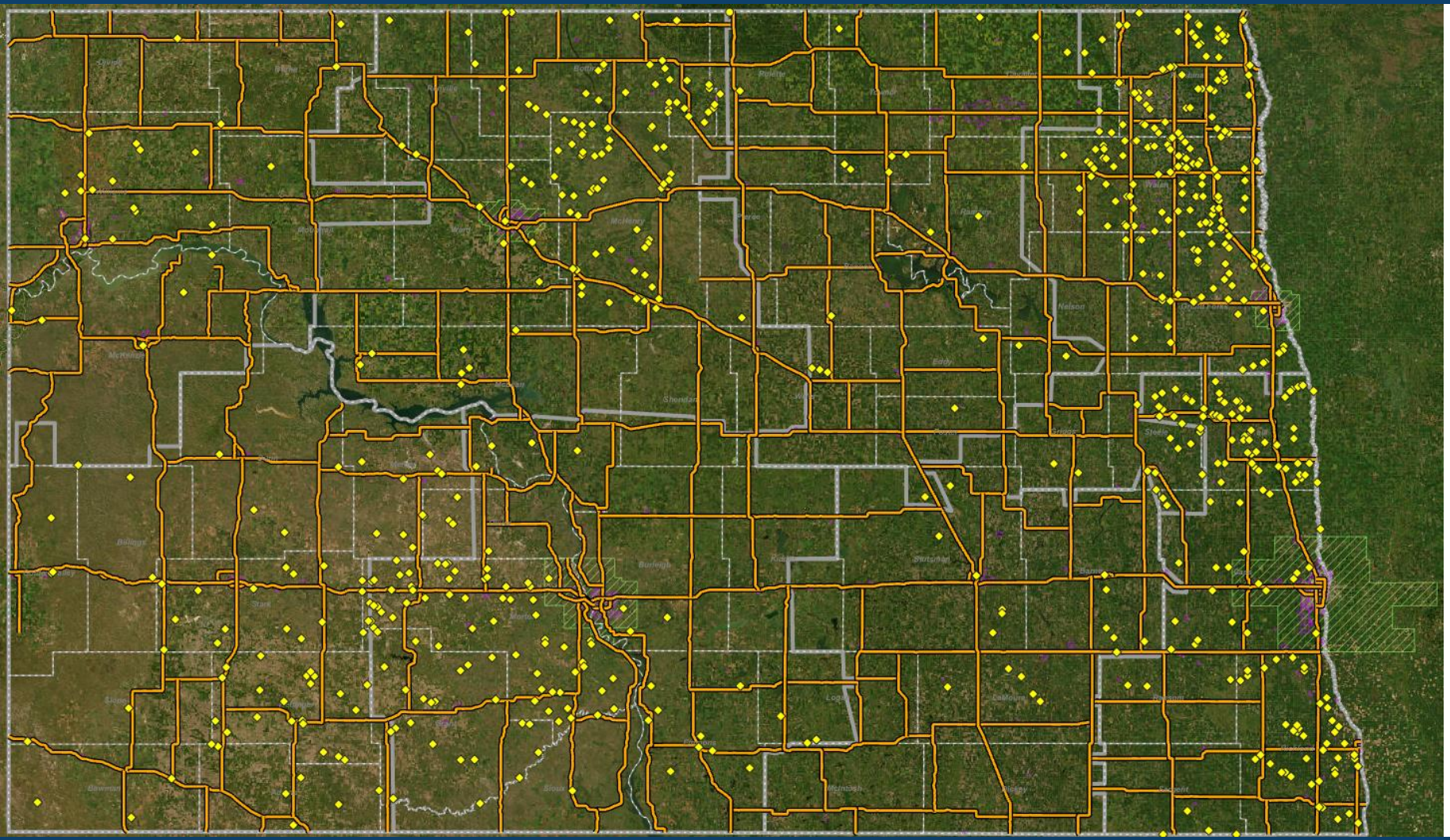
CURRENT POSTED BRIDGES



State: 1
Deck Area: 360 sq ft

Non-State: 710
Deck Area: 870,502 sq ft

Source: ND Bridge Condition Map

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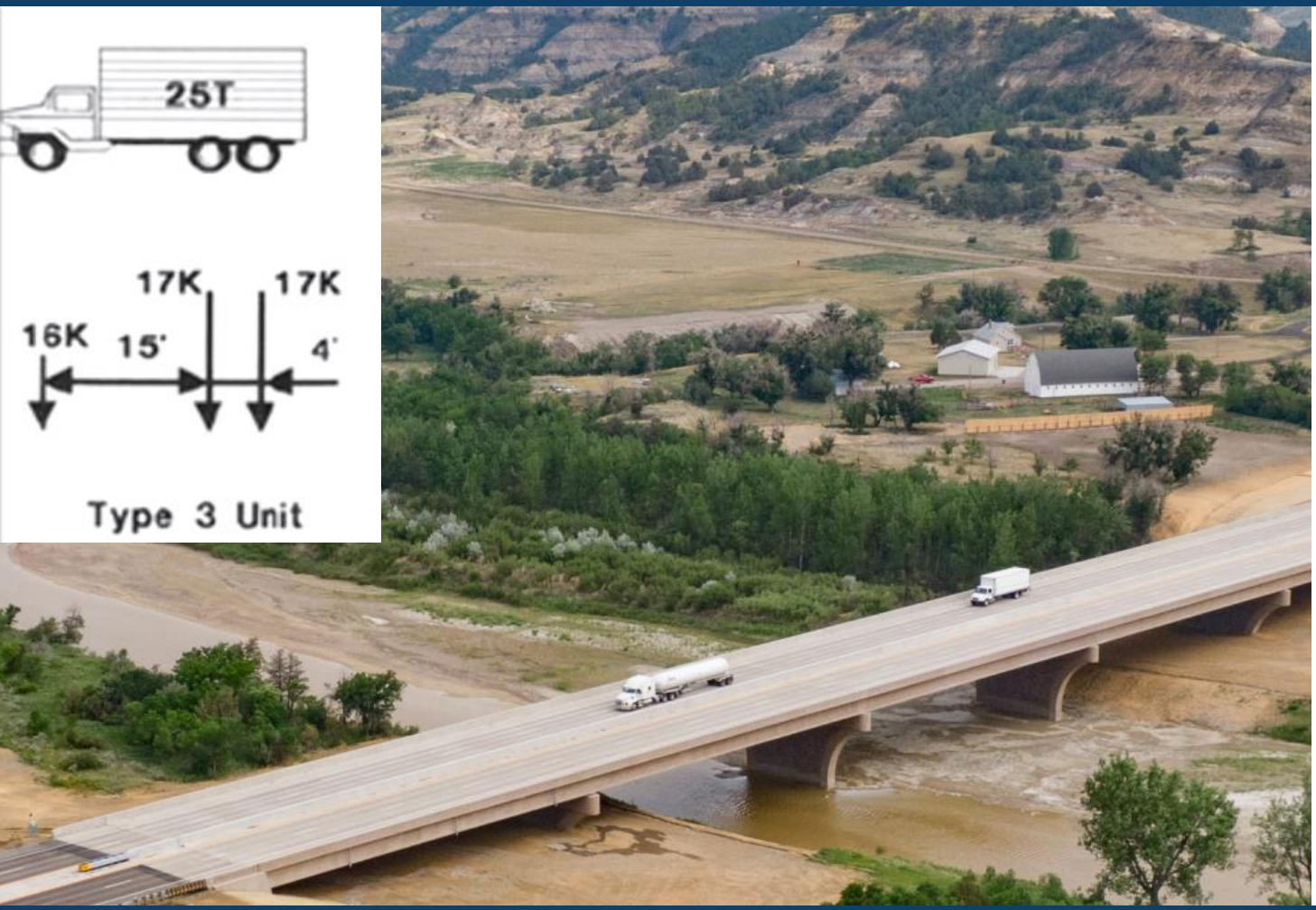
LEGAL LOAD EVALUATION

- AASHTO Legal Loads
- All new bridges must have a Load rating factor (RF) of 1.0 or higher.
- Bridges with RF less than 1.0 will require load posting

LEGAL LOAD EVALUATION



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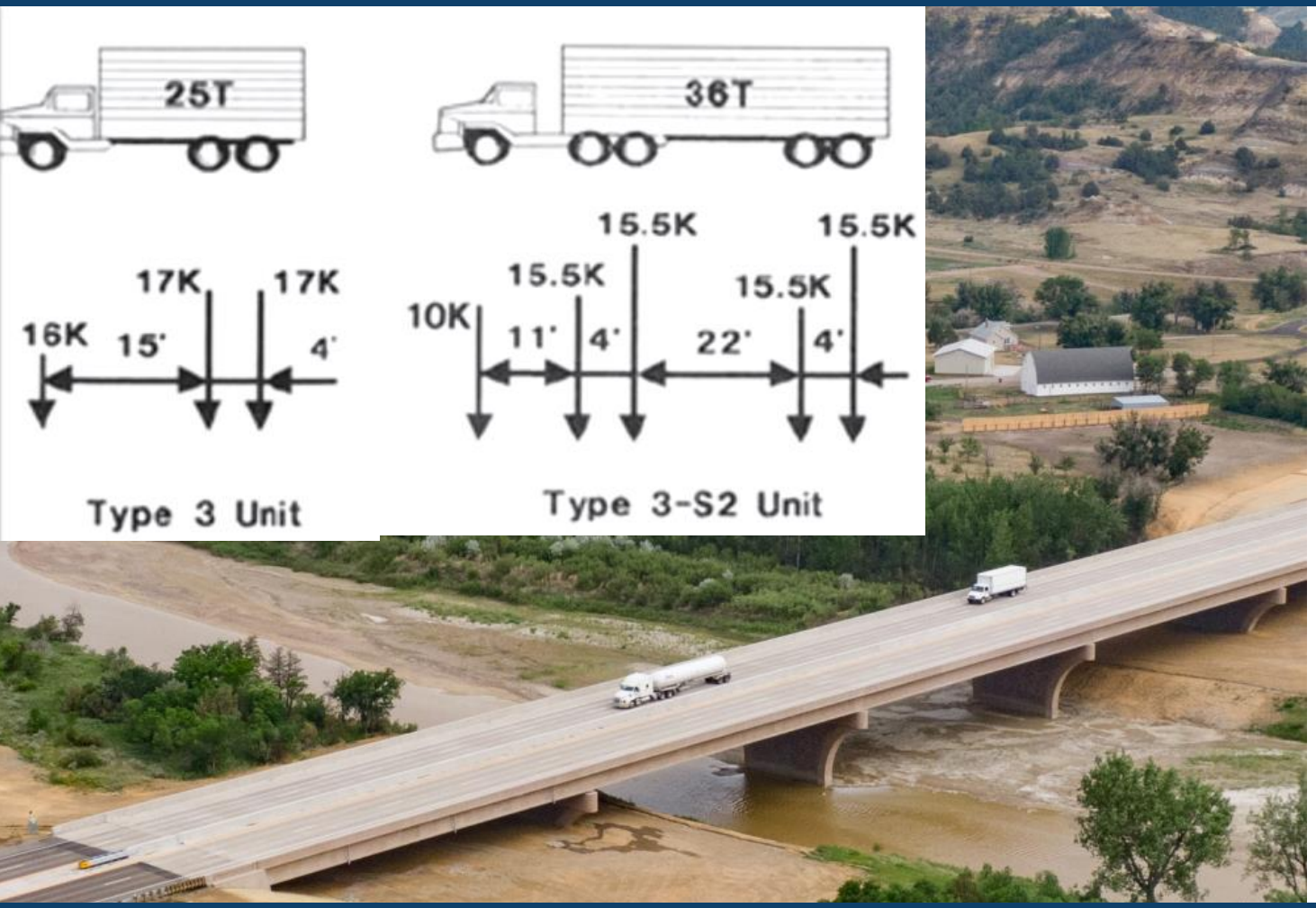

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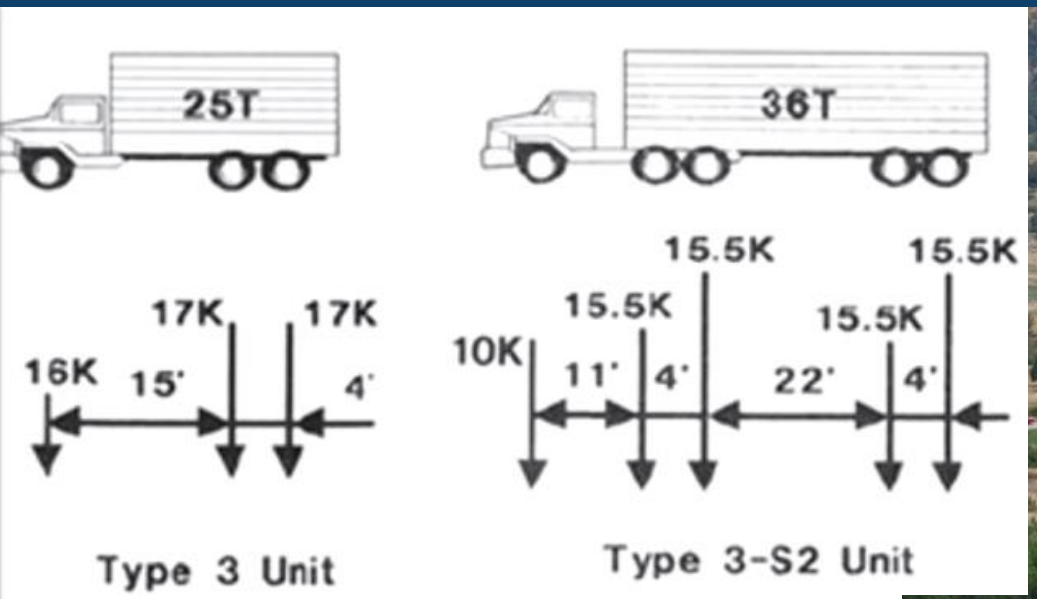
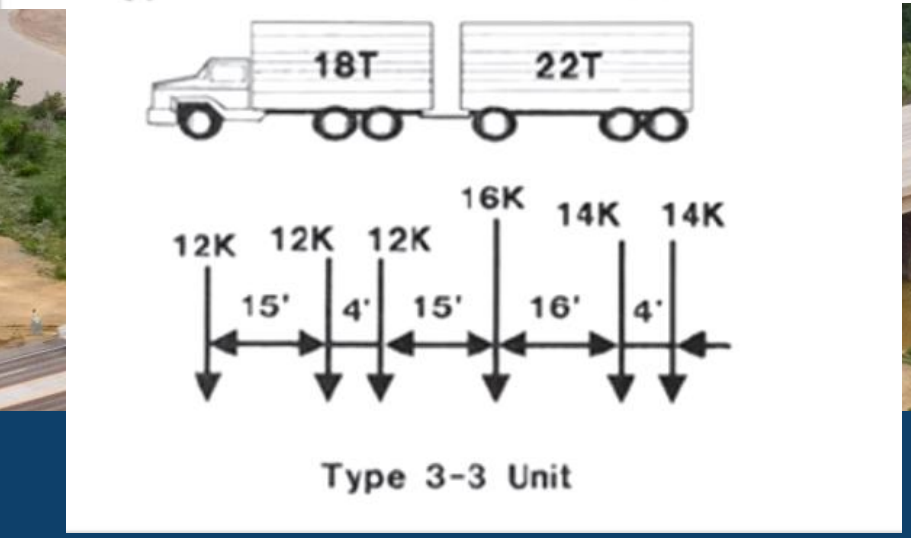




- **AASHTO Legal Loads**
- All new bridges must have a Load rating factor (RF) of 1.0 or higher.
- Bridges with RF less than 1.0 will require load posting

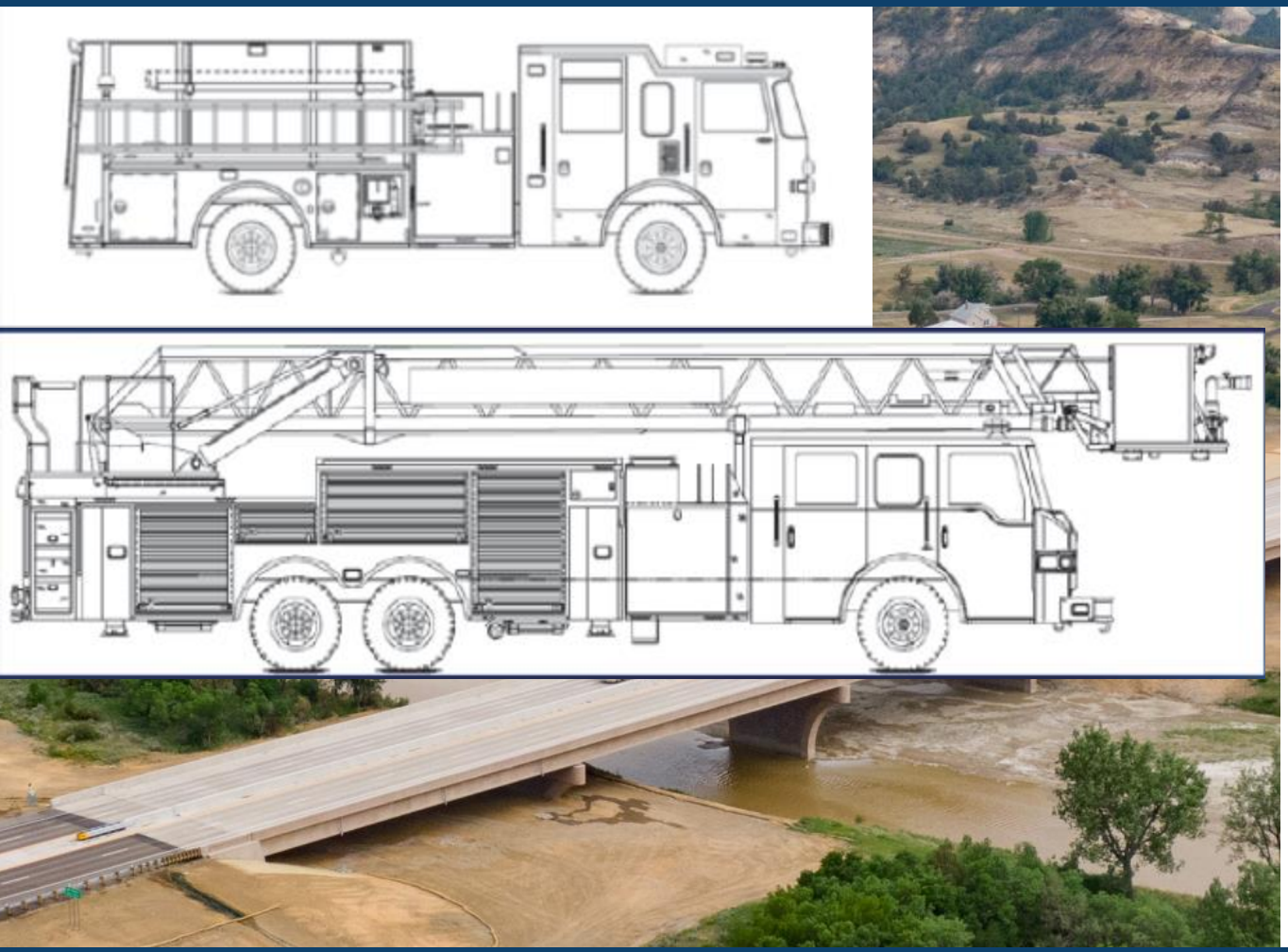
LEGAL LOAD EVALUATION

- AASHTO Legal Loads
- **AASHTO Single Unit Loads (SU)**
- All new bridges must have a Load rating factor (RF) of 1.0 or higher for each load.
- Bridges with RF less than 1.0 will require posting.

LEGAL LOAD EVALUATION

- AASHTO Legal Loads
- AASHTO Single Unit Loads (SU)
- **FHWA Emergency Vehicles (EV)**
- Bridges within 1 mile of the Interstate with an EV rating less than 1.0 will require EV load posting.

LEGAL LOAD EVALUATION



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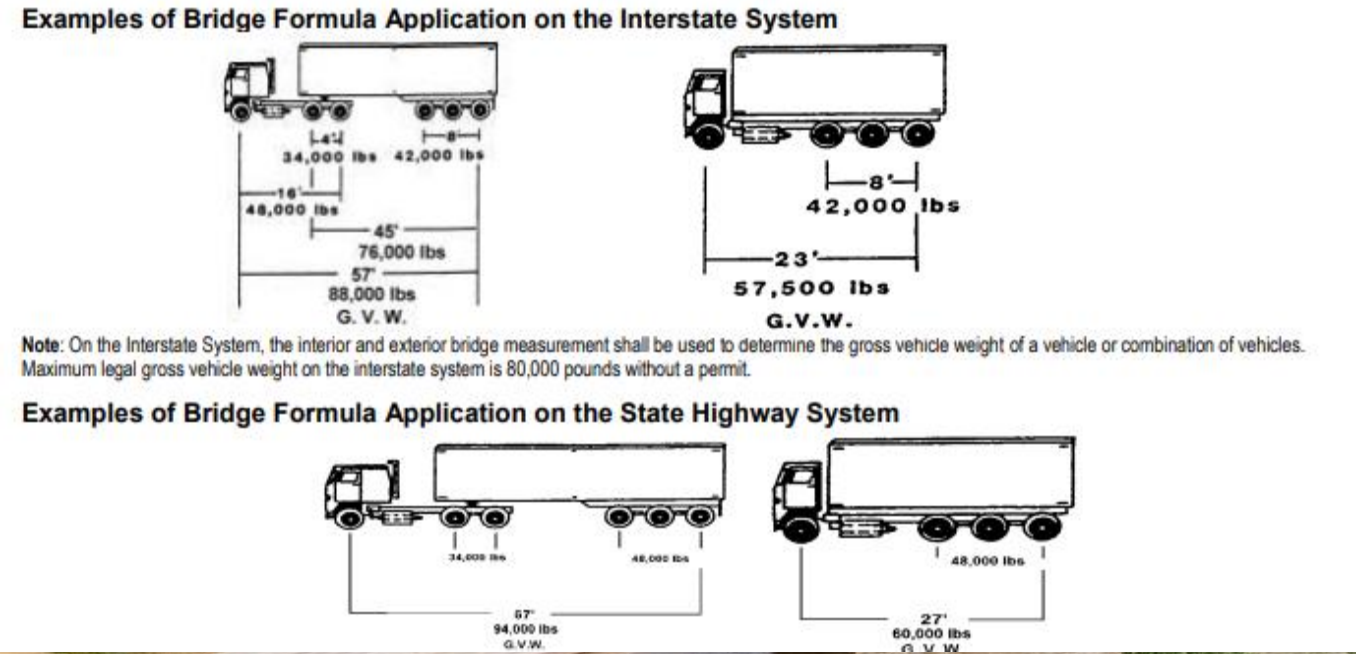
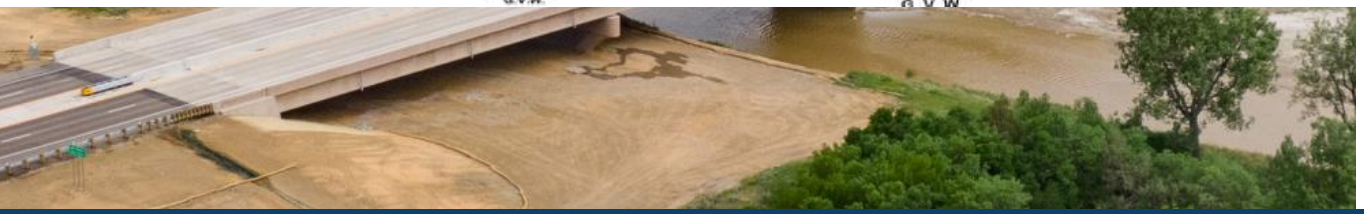
STATE LEGAL LOAD EVALUATION

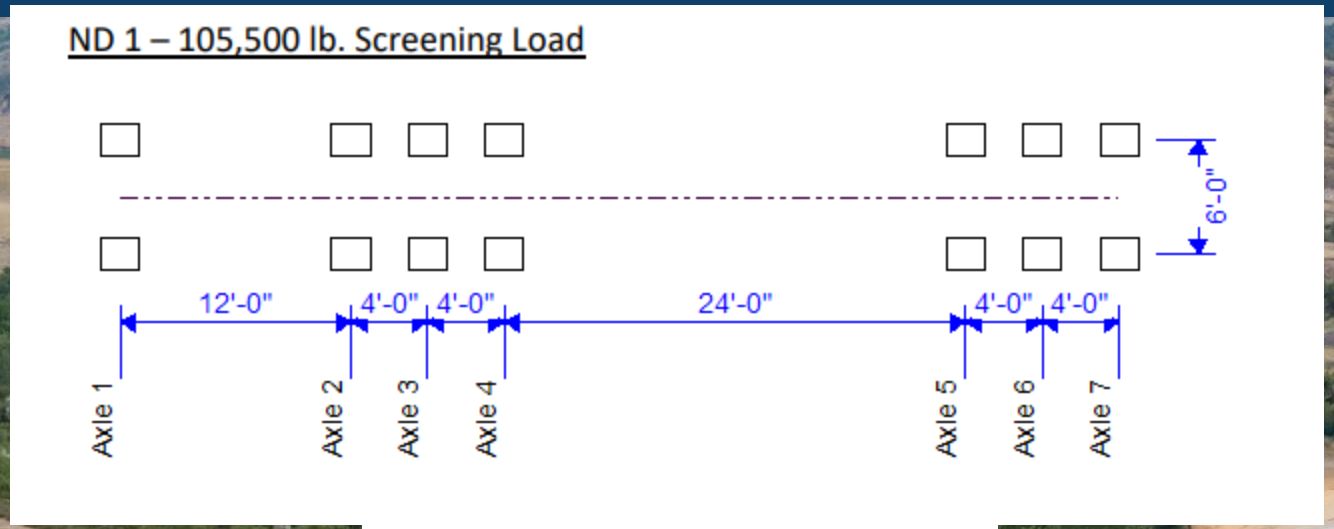




- AASHTO Legal Loads
- AASHTO SU4-SU7
- FHWA EV1/EV2
- **State Legal Loads (105,500 lb Max)**
- Bridges with ND1 rating less than 1.0 are restricted to 80,000 lb route max

https://www.nd.gov/ndhp/motor-carrier-operations/legal-vehicle-size-and-weight

STATE LEGAL LOAD EVALUATION



Axle 1	9,500 lbs
Axle 2	16,000 lbs
Axle 3	16,000 lbs
Axle 4	16,000 lbs
Axle 5	16,000 lbs
Axle 6	16,000 lbs
Axle 7	16,000 lbs
GVW	105,500

- AASHTO Legal Loads
- AASHTO SU4-SU7
- FHWA EV1/EV2
- **State Legal Loads (105,500 lb Max)**
- Bridges with ND1 rating less than 1.0 are restricted to 80,000 lb route max

https://dotsc.ugpti.ndsu.nodak.edu/TWC/WeightCalculator.aspx

NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

TRUCK WEIGHT CALCULATOR

- Enter Truck Specifications
  - Axle Spacing
  - Tire Width
- Enter Route
  - North Dakota
    - Interstate
    - State Highway
  - Minnesota

https://dotsc.ugpti.ndsu.nodak.edu/TWC/WeightCalculator.aspx

Legal GVW - Interstate: 80,000 lbs.
With Permit: up to 89,000 lbs.

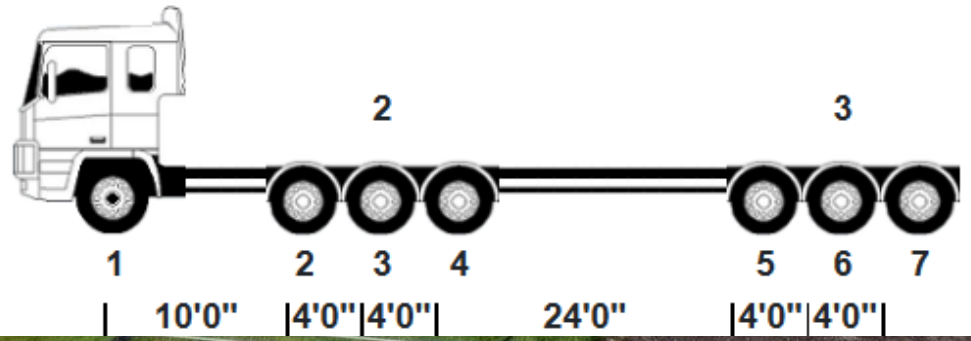
maximum legal gross vehicle weight for this vehicle/vehicle combination.

Weight (per bridge length chart): 89,000 lbs.

Truck image with the Axle Group Number above axle group and Axle Number below each axle.

Distances (the linear measurement from axle center to **consecutive** axle center) are shown below the axle numbers of the truck image.

A black-centered wheel denotes two tires per axle and a white-centered wheel denotes four tires per axle.



NDSU UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

TRUCK WEIGHT CALCULATOR

- Enter Truck Specifications
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  - Tire Width
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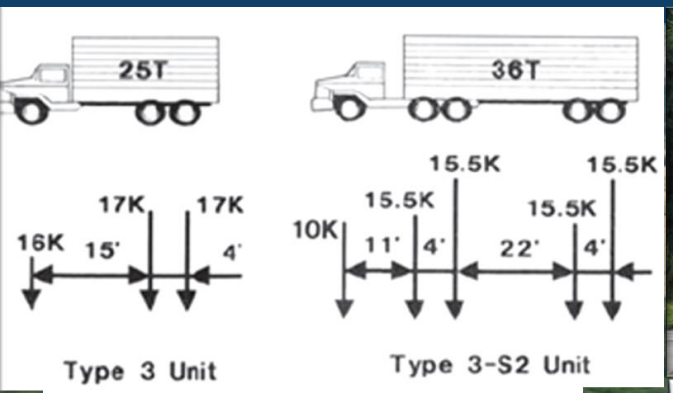
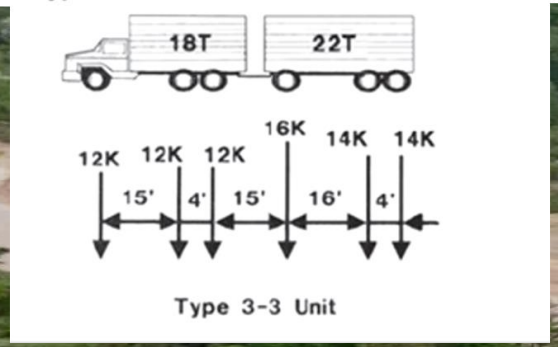
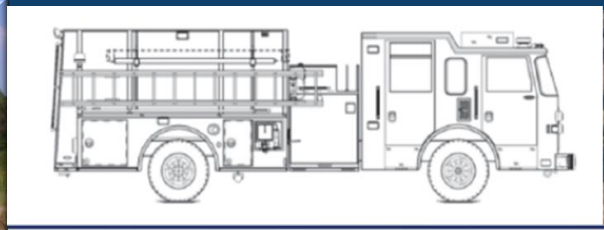
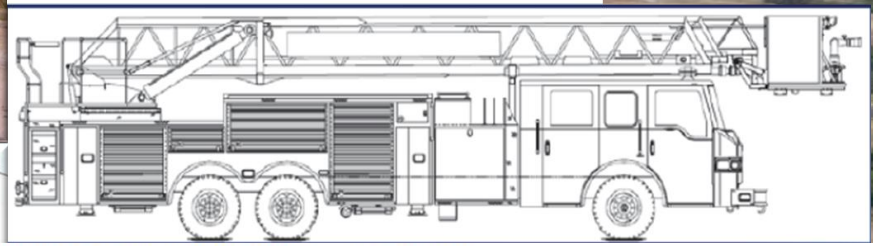
  - Minnesota

POSTING LOAD EVALUATION

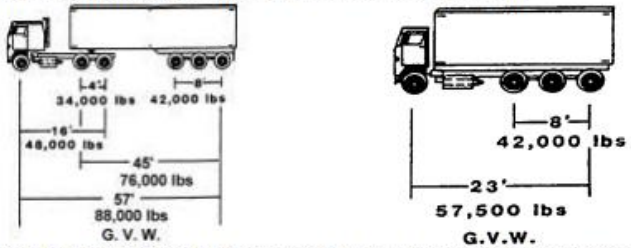






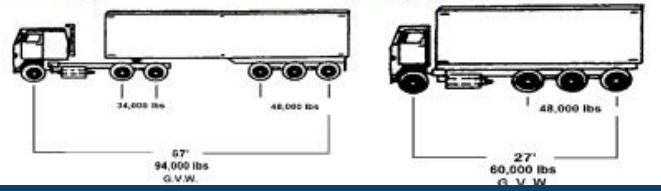


Examples of Bridge Formula Application on the Interstate System



Note: On the Interstate System, the interior and exterior bridge measurement shall be used to determine the gross vehicle weight of a vehicle or combination of vehicles. Maximum legal gross vehicle weight on the interstate system is 80,000 pounds without a permit.

Examples of Bridge Formula Application on the State Highway System



https://www.nd.gov/ndhp/motor-carrier-operations/legal-vehicle-size-and-weight

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BRIDGE POSTINGS

Example Load Rating Summary Sheet

		LRFR RATINGS								LFR/ASD/ENGR JUDGEMENT RATINGS					
Level	Vehicle	GVW (Tons)	Rating Factor	Rating Tons	Posting Tons[2]	Limit State	Mode	Member[3]	Span	Rating Factor	Rating Tons	Posting Tons[4]	Mode	Member	Span
Design	HL-93 (INV)	36													
	HL-93 (OPR)	36													
	HS-20 (INV)	36								0.60	21.6		Flexure	G2	1
	HS-20 (OPR)	36								1.01	36.2	N/A[7]	Flexure	G2	1
Legal[5]	Type 3	25								1.13	28.3	N/A[7]	Flexure	G2	1
	Type 3-3	40								1.37	54.9	N/A[7]	Flexure	G2	1
	Type 3S2	36								1.19	42.9	N/A[7]	Flexure	G2	1
	NRL	40								0.81	32.4	32	Flexure	G2	1
	SU4	27								0.95	25.6	25	Flexure	G2	1
	SU5	31								0.88	27.2	27	Flexure	G2	1
	SU6	35								0.82	28.3	28	Flexure	G2	1
	SU7	39								0.81	31.5	31	Flexure	G2	1
	~~EV2~~	~~29~~		-	-						-	-			
	~~EV3~~	~~43~~		-	-						-	-			
	~~ND1~~	~~53~~													
Permit[5,6]	~~ND2~~	~~59~~													
				Controlling Posting	**25**										
				~~Emergency Vehicle Posting~~	**~~N/A~~[8]**										

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RECOMMENDED POSTING SIGNS

R12-1

R12-4

PERMIT LOAD EVALUATION

- 10% Overweight Permits
  - Can be issued on bridges with Load rating of 1.1 or higher for Legal Loads
- 129,000 lb Routes
  - 8 129k configurations (129A-129 H)
  - May be issued on bridges with a load rating of 1.0 or higher for the 129k vehicle loads
- All other loads are single trip permits and must be analyzed individually per bridge

NDHP AUTOMATED ROUTING SYSTEM

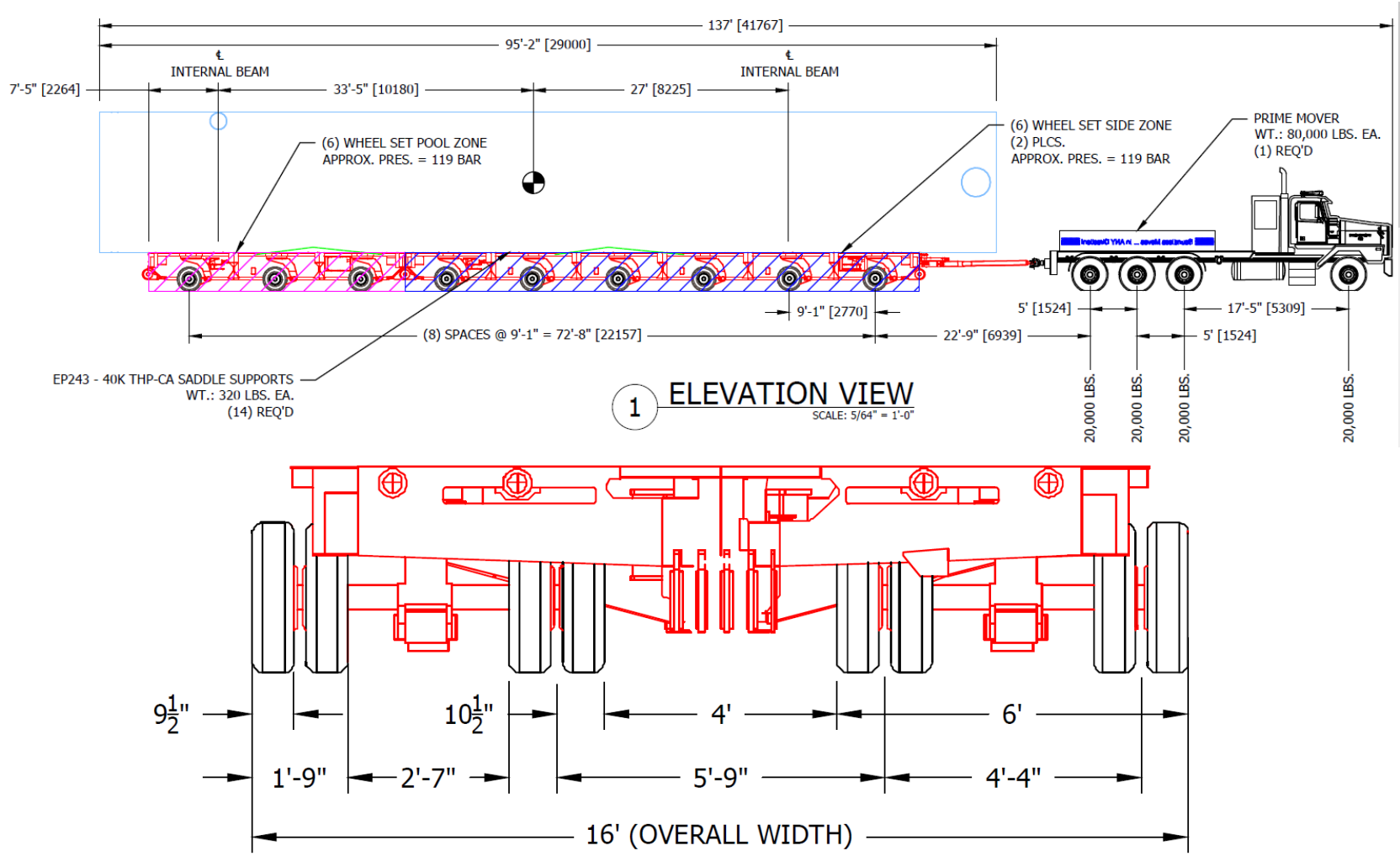
- All bridges on a requested permit route are automatically analyzed using truck data provided by the hauler and bridge data provided by the NDDOT
- Permits are sent to bridge division for review if
  - The permit fails to cross a bridge.
  - The load is over 250,000 lbs.
  - The permit contains a non-standard gauge (Multi Axle-Trunnion) trailer.

MEGA LOADS

- 250,000 Lbs. and Larger
- Non-Standard Guage (Multi Axle - Trunnion) Trailer Configurations

MEGA LOADS

- **Critical Information Needed for Analysis**
  - Axle Weights
  - Axle Spacing
  - Track Widths



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AUTOMATED ROUTING SYSTEM

- After bridges are approved, the permit advances to the District Engineers for roadway approval
- After District approval the permit is made available for purchase

WHAT'S NEW?

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WEBSITE UPDATES:

dot.nd.gov/construction-and-planning/bridge

MyDOT Home Page | InspectX | McKenzieCountyCo... | Login - Engagifii | Welcome to AASHT... | InspectX | inspectX MultiAsset | Risk Assessment Ma... | Imported (1) | All

Home / Construction and Planning / Bridge

Bridge

The NDDOT designs, constructs, maintains, and manages North Dakota bridges to help ensure a safe and reliable transportation network. Gather information on bridge design, the inspection program and bridge conditions across North Dakota.

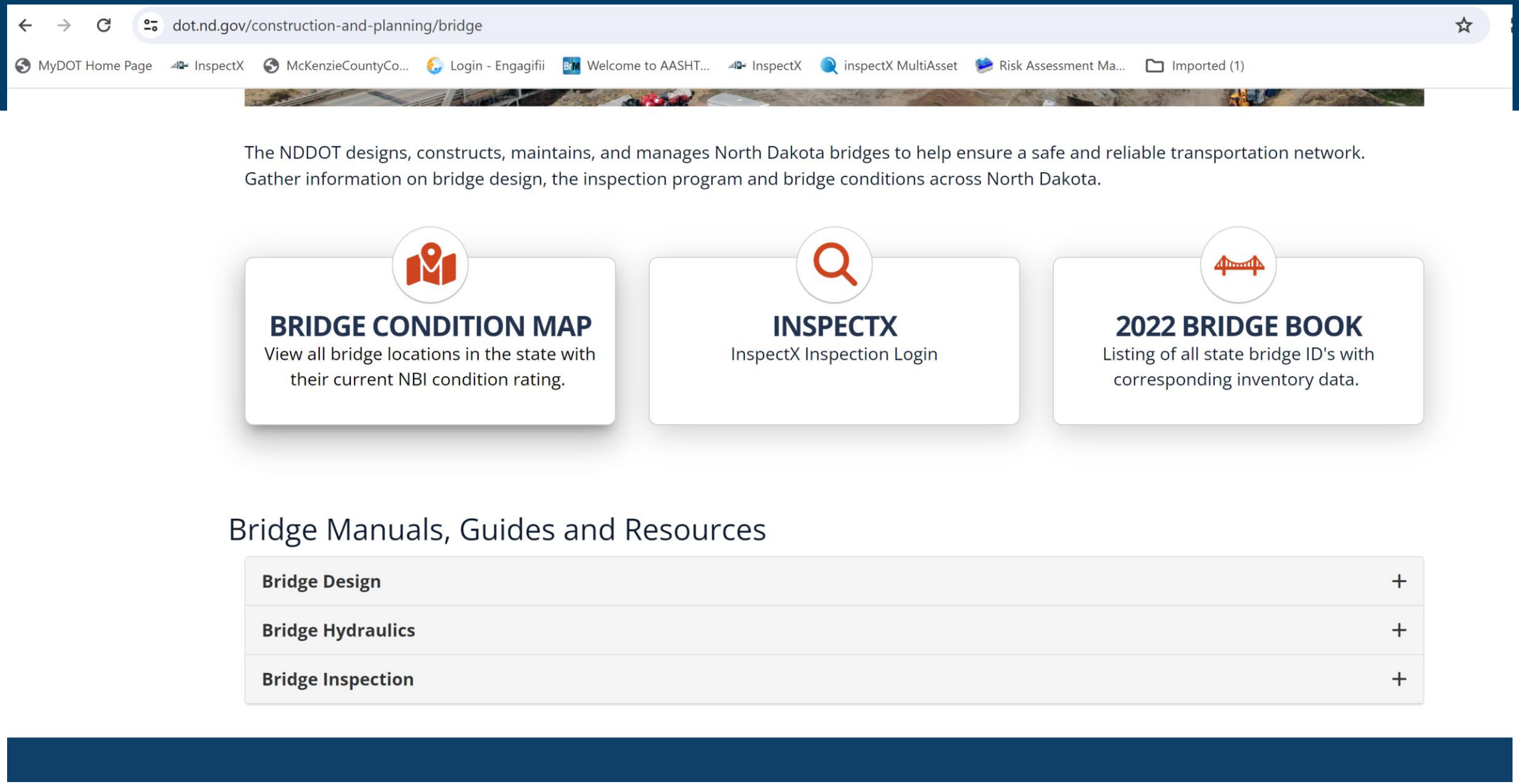
BRIDGE CONDITION MAP
View all bridge locations in the state with their current NBI condition rating.

INSPECTX
InspectX Inspection Login

2022 BRIDGE BOOK
Listing of all state bridge ID's with corresponding inventory data.

Feedback (+)

WEBSITE UPDATES:



WEBSITE UPDATES:

Bridge Manuals, Guides and Resources

Bridge Design +

Bridge Hydraulics +

Bridge Inspection −

Inspection:

- Inspect X
- ND Bridge Inspection Manual
- Bridge Inspection Notification Form
- Bridge Critical Finding Form
- NDDOT PONTIS
- AASHTOWare BrM

Scour Critical Bridges:

- Scour (Metric 18) Local Training PowerPoint
- Scour (Metric 18) Local Training Recording

Load Rating:

- ND Bridge Load Rating Manual
- Load Rating Summary Sheet

External Resources:

FHWA Bridge Inspection

LTBP InfoBridge

+

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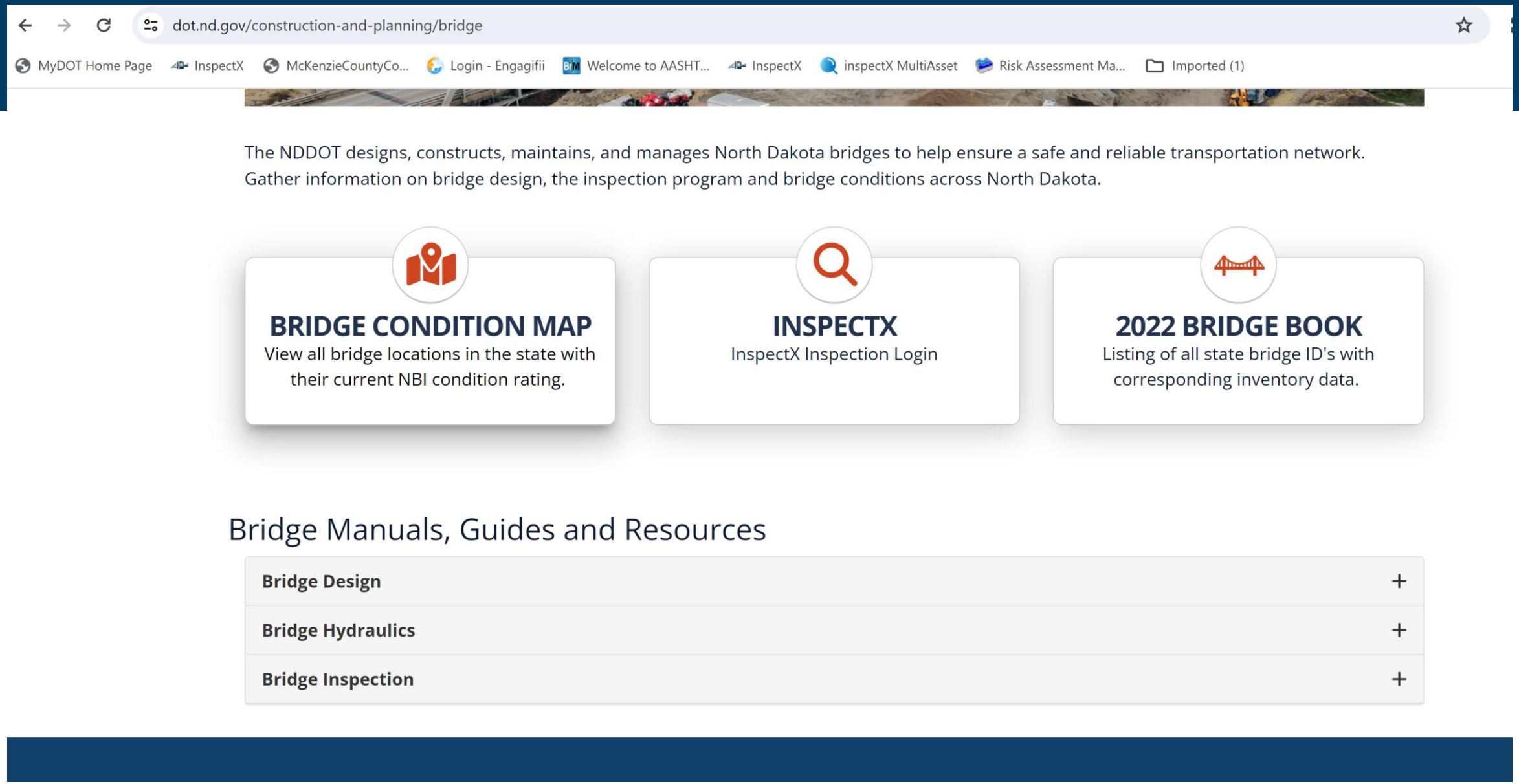
WEBSITE UPDATES:



BRIDGE CONDITION MAP

Overload Permits | MyDOT | Bridge Division | Bridge | NDDOT | BrM | InspectX | SNBIX | Filenet | Roll Numbers | Bridge View | Bridge RIMS Viewer | Dakota Wellness Pr... | BrR Jira Support | BrR IRU | DocuSign | STIP | All Bookmarks

All Bridges | Poor Bridges | Posted and Closed | Bridges Built Prior to 1940 | Scour Critical Bridges | Bridges By Year | State Bridge Performance | Dashboard

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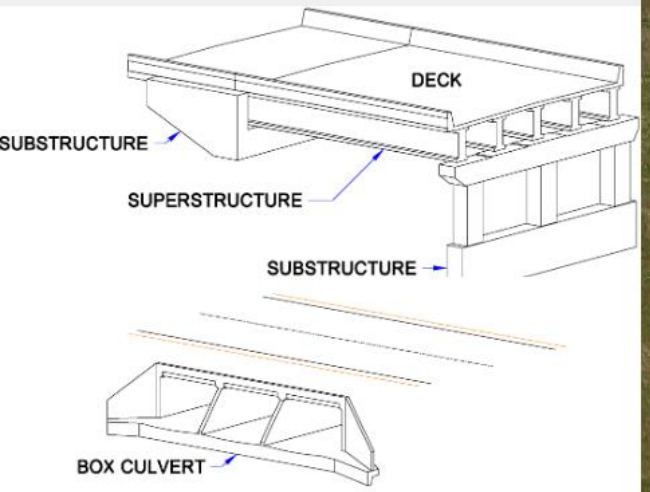
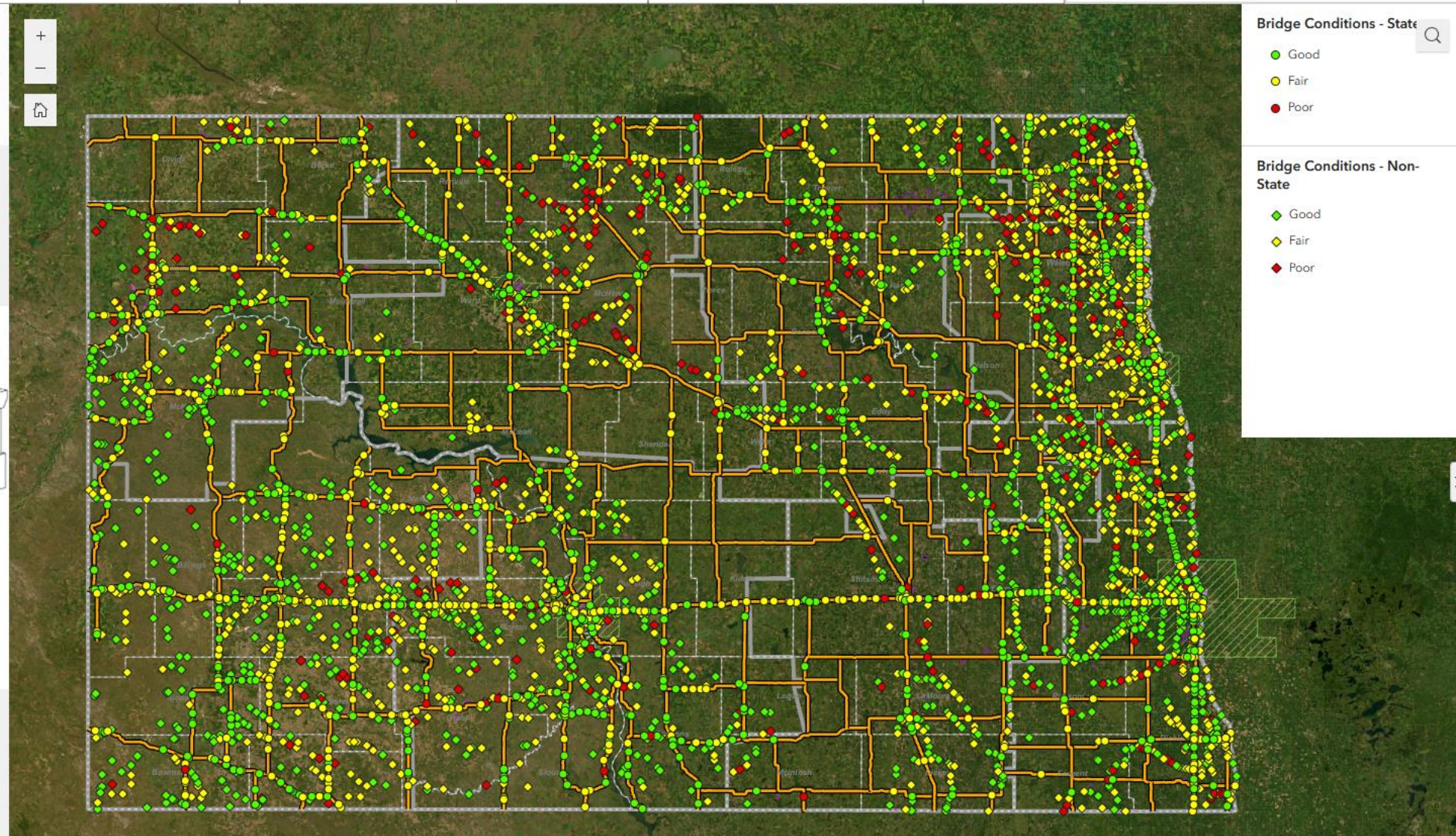
Federal laws, outlined in the National Bridge Inspection Standards (NBIS), defines a bridge as a structure carrying vehicle traffic with a span greater than 20 feet and requires that all bridges receive a routine inspection every twenty-four month to monitor and report condition ratings.



NBI condition ratings are based on a scale of 0-9 and are assigned for each culvert and each bridge deck, superstructure and substructure. These ratings are recorded in the National Bridge Inventory (NBI) database. Condition ratings are an important tool for managing bridge assets as they are used to help identify maintenance, preservation, rehabilitation, and replacement needs.



METRIC 18 SCOUR TAB

All Bridges | Poor Bridges | Posted and Closed | Bridges Built Prior to 1940 | Scour Critical Bridges | Bridges By Year | State Bridge Performance | Dashboard

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Filter bridges by:

Owner	District	County	POA Catagory
None	None	None	None

Scour Map

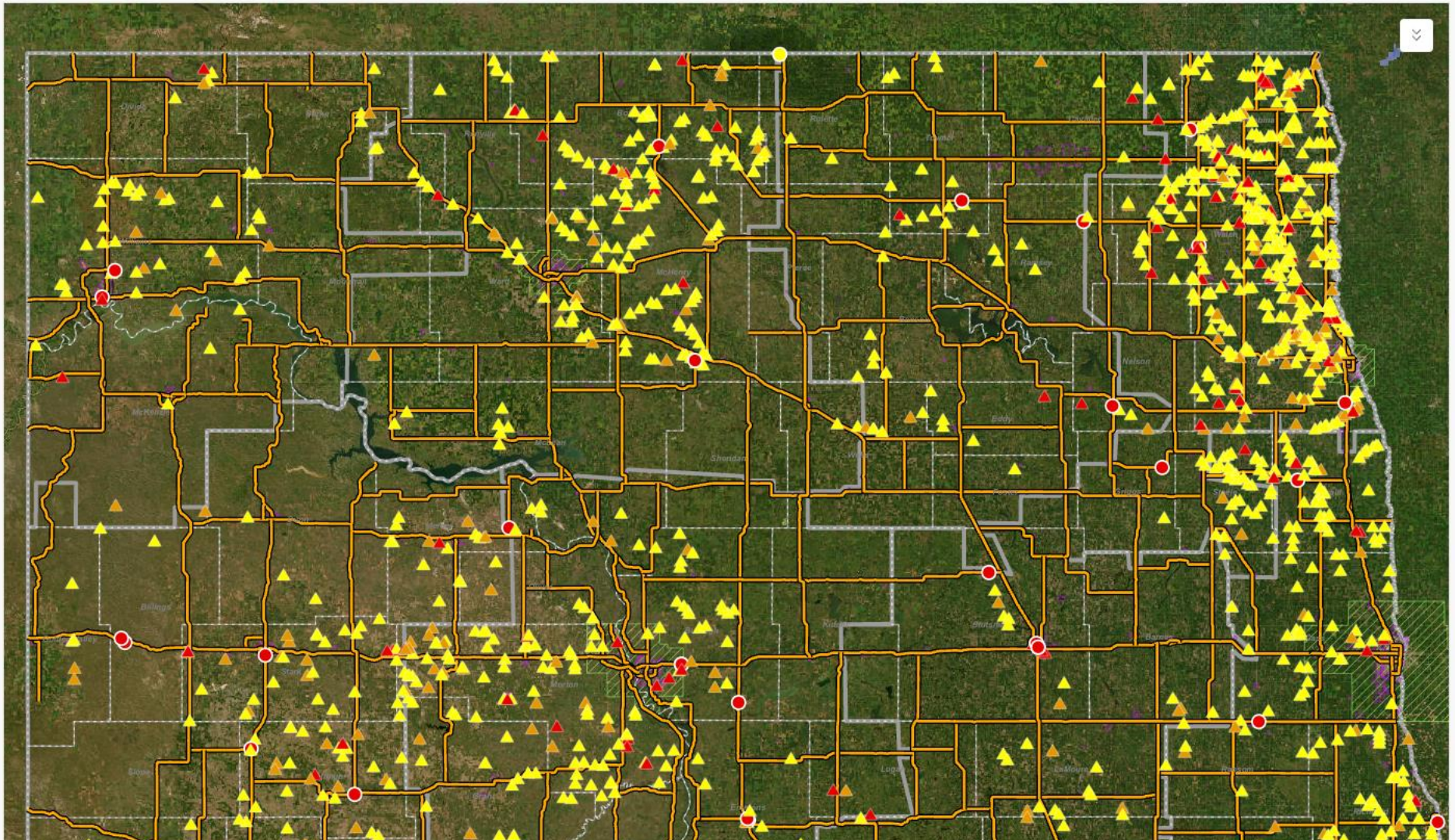
Scour is the process of water flow eroding sediment around bridge foundations, and when it occurs can cause significant risk to infrastructure stability. The National Bridge Inspection Standards (NBIS), under 23 CFR Part 650, mandate that every bridge must have a scour appraisal completed to determine its vulnerability to scour. Scour critical bridges, shown on the map, are those identified as particularly vulnerable to this phenomenon, requiring specific monitoring and maintenance protocols to ensure public safety and operational continuity. Bridges that lack detailed records of their foundations, such as how deep pile supports were installed, are referred to as unknown foundations. Without knowing foundation details, it is difficult to assess how vulnerable these bridges are to scour. These bridges are also shown on the map.

The NBIS also requires by law that bridge owners develop and implement a Plan of Action (POA) for scour critical and unknown foundation bridges, focusing on proactive monitoring and response strategies tailored to each bridge's risk profile.

A Plan of Action (POA) is a comprehensive document that outlines strategies and protocols for managing scour critical and unknown foundation bridges. Bridges with that are scour critical or have unknown foundations are categorized into Category A, B, & C based on their risk levels, with each category dictating specific monitoring and maintenance requirements.

- **Category A**: High-risk bridges with severe vulnerabilities such as poor substructure conditions or shallow foundations. These require intensive monitoring during flood events (every 24 hours) and prompt post-flood inspections within 30 days.
- **Category B**: Moderate-risk bridges with fewer vulnerabilities. These bridges need flood monitoring every 7 days and post-flood inspections within 60 days.
- **Category C**: Low-risk bridges, often with low traffic or older structures that have had minimal damage from previous floods. Post-flood inspections are deferred to the next routine inspection.

Monitoring Requirements: The monitoring requirements outlined in the POA are crucial for early detection of potential scour problems and prompt intervention to



MUTCD 11TH EDITION UPDATE

Section 2B.64 Weight Limit Signs (R12-1 through R12-7)

Standard:

If the R12-5 sign depicts only one single-unit vehicle symbol, the weight limit associated with that single-unit vehicle symbol shall apply to all single-unit vehicles, regardless of number of axles.

The weight limit associated with the single-trailer vehicle symbol shall apply to all single-trailer vehicles, regardless of number of axles or vehicle shape.

The weight limit associated with the multi-trailer vehicle symbol shall apply to all multi-trailer vehicles with two or more trailers, regardless of number of axles or vehicle shape.

A weight limit sign (see Figure 2B-30) shall be located at the applicable section of highway or structure.

An additional weight limit sign, with an advisory distance or directional legend, shall be located in advance of the applicable section of highway or structure so that prohibited vehicles can detour or turn around prior to the limit zone.

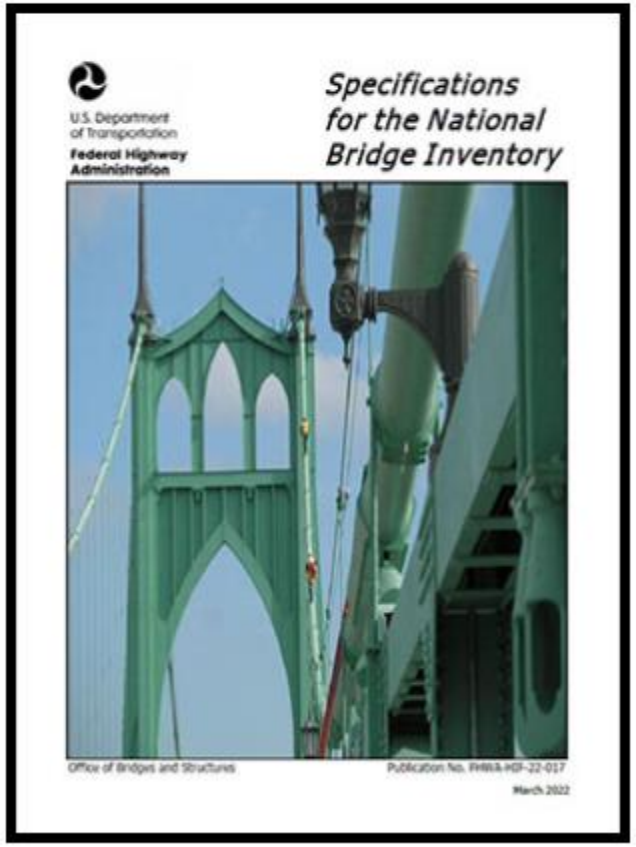
Table 1B-1. Target Compliance Dates Established by the FHWA

MUTCD Section(s)	Subject Area	Specific Provision	Compliance Date
2B.64	Weight Limit Signs	Paragraph 14 - requirement for additional Weight Limit sign with the advisory distance or directional legend in advance of applicable section of highway or structure	5 years from the effective date of this edition of the MUTCD

SNBI - NEW CODING GUIDE

National Bridge Inventory – Based on the Coding Guide

National Bridge Inventory – Based on the SNBI



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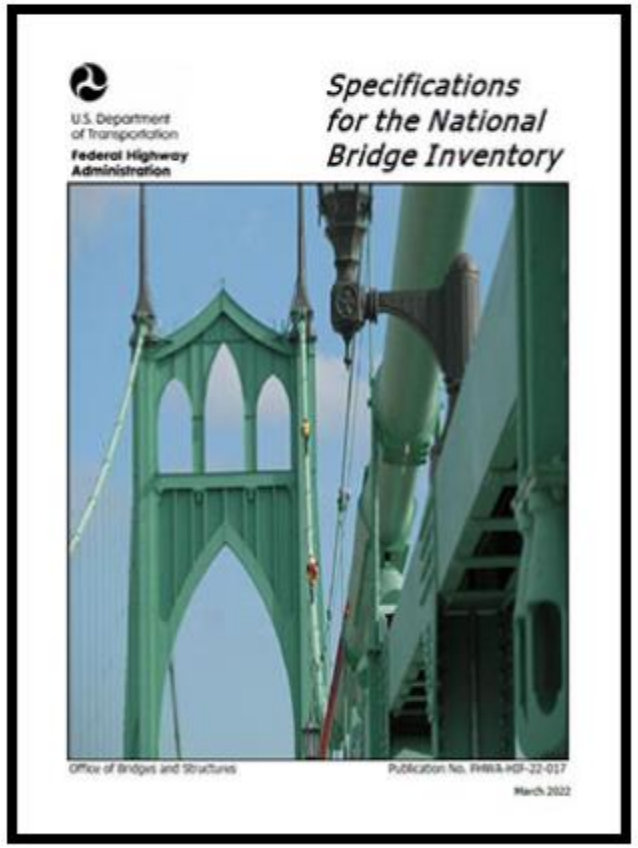

- Legal Loads and Ratings Available in the Data Set
- New Codes for Open/Posted/Closed with date of when Change Occurred
- Codes for Posting Sign Type
- Controlling Legal Rating
- Pass/Fail Code for Routine Permit Routes (10% Over/129k Route)

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