

National Bridge Inspection Standards (NBIS)

&

Specifications for the National Bridge Inventory (SNBI)

Overview and Q&A

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Introduction & Timeline

National Bridge Inspection Standards (NBIS)

• FHWA oversight of highway bridge safety

Target Date	Action
May 6, 2022	Regulation published in Federal Register
June 6, 2022	Regulation effective (unless noted otherwise)
June 6, 2024	Sections which allow up to 24 months to implement become effective

Specifications for the National Bridge Inventory (SNBI)

Replaces the SI&A Coding Guide

Target Date	Action
March 2025	Last SI&A Coding Guide submittal
January 2025	Begin collecting data per the SNBI
March 2028	First complete SNBI data submittal

SNBI Data Entry

154 total SNBI items

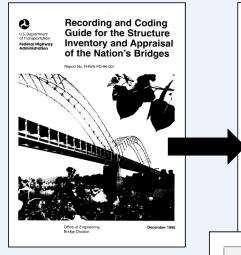
- 54 new items
- 20 discontinued items

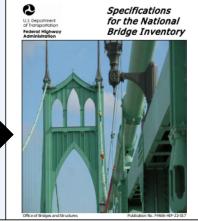
SNBI Frequency Categories

- Initial, Each Inspection, Calculated
- 113 items collected during initial inspection

SNBI Item ID

Format is B.XX.XX





Commentary Continued

consider primary load carrying members when determining the condition rating code for this item, which includes cross-frames and diaphragms for curved girder bridges. Consider secondary members only if they adversely impact the primary members. Visual assessments may be supplemented with non-destructive or destructive testing results.

The superstructure includes:

Item B.SP.01 (Span Configuration

- members above the bearings for bridges with non-integral superstructure and substructure;
- girders/beams for integral superstructures;
- members above the spring line for arch bridges; slabs of concrete rigid frame bridges; and
- legs, knees and girders for concrete and steel rigid K-Frame or Delta-Frame bridges.

<u>Item 59 - Superstructure</u>

This item describes the physical condition of all structural members. Rate and code the condition in accordance with the previously described general condition ratings. Code N for all culverts.

The structural members should be inspected for signs of distress which may include cracking, deterioration, section loss, and malfunction and misalignment of bearings.

The condition of bearings, joints, paint system, etc. shall not be included in this rating, except in extreme situations, but should be noted on the inspection form

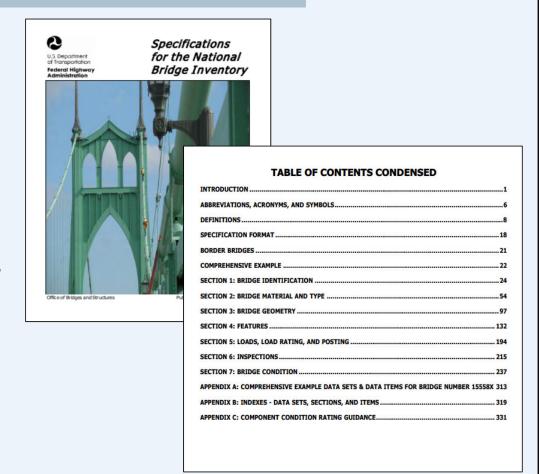
SNBI Data Entry

Data entered by Bridge Owners

- Section 1: Bridge Identification
- Section 2: Bridge Material & Type
- Section 3: Bridge Geometry
- Section 4: Features
- Section 5: Loads, Load Rating & Posting

Data entered by Bridge Inspectors

- Section 6: Inspections
- Section 7: Condition data



SNBI Data Entry

SNBI Impacts

- New Items
- Expanded Item Codes
- Many-to-One Ratio

Initial SNBI Inspection

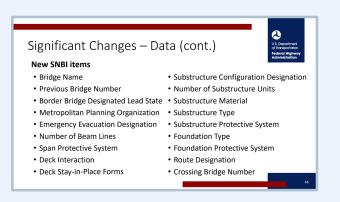
• 4 – 6 additional hours

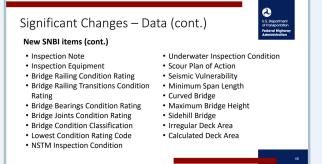
NPRM Cost Response	MDOT Estimate	
1 Hour – 10 Hours per bridge	Local Agency Bridges 4 Hours per bridge • Field: Add 1 hour • File/Office: Add 3 hours	
	 State Owned Bridges 4-6 Hours per bridge Field: Add 1-2 hour File/Office: Add 3-4 hours 	

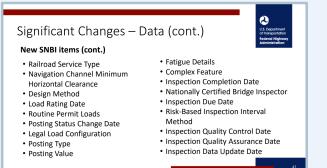
SNBI Impacts: New Items

New SNBI Items

- 54 new items
- Some Michigan items
- FHWA discussion







SNBI Impacts: Expanded Item Codes

New and expanded item codes

- Span Material
- Span Type

SI&A Item 43A Structure Material

<u>Code</u>	<u>Description</u>
1 2 3 4 5 6 7 8 9	Concrete Concrete continuous Steel Steel continuous Prestressed concrete * Prestressed concrete continuous * Wood or Timber Masonry Aluminum, Wrought Iron, or Cast Iron Other



	Specification		
Report the principal span material type using one of the following codes.			
Code	Description		
A01	Aluminum		
C01	Reinforced concrete – cast-in-place		
C02	Reinforced concrete – precast		
C03	Prestressed concrete - pre-tensioned		
C04	Prestressed concrete – cast-in-place post-tensioned		
C05	Prestressed concrete – precast post- tensioned		
СХ	Concrete – other		
F01	FRP composite – aramid fiber		
F02	FRP composite – carbon fiber		
F03	FRP composite – glass fiber		
FX	FRP composite – other		
I01	Iron – cast		
102	Iron – wrought		
M01	Masonry – block		
M02	Masonry – stone		
P01	Plastic – Polyethylene		
PX	Plastic - other		
501	Steel – rolled shapes		
S02	Steel – welded shapes		
S03	Steel – bolted shapes		
S04	Steel – riveted shapes		
S05	Steel – bolted and riveted shapes		
SX	Steel - other		
Codes	continued next page.		

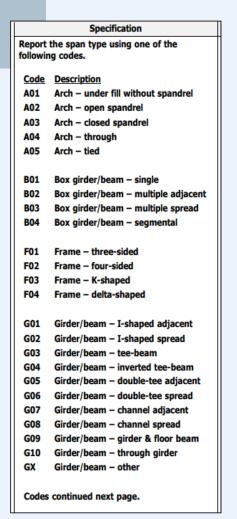
SNBI Impacts: Expanded Item Codes

New and expanded item codes

- Span Material
- Span Type

SI&A Item 43B Structure Type

	/ I
<u>Code</u>	Description
01	Sl ab
02	Stringer/Multi-beam or Girder
03	Girder and Floorbeam System
04	Tee Beam
05	Box Beam or Girders - Multiple
06	Box Beam or Girders - Single or Spread
07	Frame (except frame culverts)
08	Orthotropi c
09	Truss - Deck
10	Truss - Thru
11	Arch - Deck
12	Arch - Thru
13	Suspensi on
14	Stayed Girder
15	Movable - Lift
16	Movable - Bascule
17	Movable - Swing
18	Tunnel
19	Culvert (includes frame culverts)
20 *	Mi xed types
21	Segmental Box Girder
$\tilde{2}\tilde{2}$	Channel Beam
00	Other
00	ocher

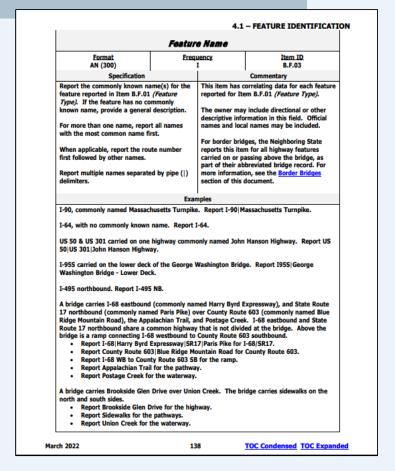


Data Set Relationships

- Many-to-One
 - Reporting an item multiple times for one bridge
- Span Material and Type
- Substructure Material and Type
- Load Rating
- Features
 - Includes features above, below, and carried on a bridge

Section 4: Features

- Subsection 4.1: Feature Identification
 - B.F.01 Feature Type
 - B.F.02 Feature Location
 - B.F.03 Feature Name





Features include above, below, and carried on bridge.

4.1 - FEATURE IDENTIFICATION

Feature Name Frequency AN (300) B.F.03 Report the commonly known name(s) for the This item has correlating data for each feature feature reported in Item B.F.01 (Feature reported for Item B.F.01 (Feature Type). Type). If the feature has no comknown name, provide a general description The owner may include directional or other descriptive information in this field. Official For more than one name, report all names names and local names may be included. with the most common name first. For border bridges, the Neight When applicable, report the route numbe reports this item for all highway features carried on or passing above the bridge, as part of their abbreviated bridge record. For Report multiple names separated by pipe (|) delimiters. more information, see the Border Bridges

I-90, commonly named Massachusetts Turnpike. Report I-90 Massachusetts Turnpike.

I-64, with no commonly known name. Report I-64.

US 50 & US 301 carried on one highway commonly named John Hanson Highway. Report US 50| US 301| John Hanson Highway.

I-95S carried on the lower deck of the George Washington Bridge. Report I95S|George Washington Bridge - Lower Deck.

I-495 northbound. Report I-495 NB.

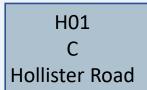
A bridge carries I-68 eastbound (commonly named Harry Byrd Expressway), and State Route 17 northbound (commonly named Paris Pike) over County Route 603 (commonly named Blue Ridge Mountain Road), the Appalachian Trail, and Postage Creek. I-68 eastbound and State Route 17 northbound share a common highway that is not divided at the bridge. Above the bridge is a ramp connecting I-68 westbound to County Route 603 southbound.

- Report I-68|Harry Byrd Expressway|SR17|Paris Pike for I-68|SR17.
 Report County Pouts 603|Rive Pides Mountain Poad for County Pouts 603|Rive Pides Rive Pides Rive
- Report County Route 603 Blue Ridge Mountain Road for County Route 603.
- Report I-68 WB to County Route 603 SB for the ramp.
 Report Appalachian Trail for the pathway.
- Report Appalachian Trail for the pathway
 Report Postage Creek for the waterway.
- Report Postage Creek for the waterway.

A bridge carries Brookside Glen Drive over Union Creek. The bridge carries sidewalks on the north and south sides.

- · Report Brookside Glen Drive for the highway.
- Report Sidewalks for the pathways.
- . Report Union Creek for the waterway.

W01 B Maple River





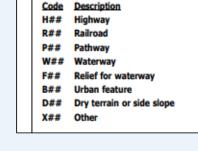
Hollister Road over Maple River
Clinton County

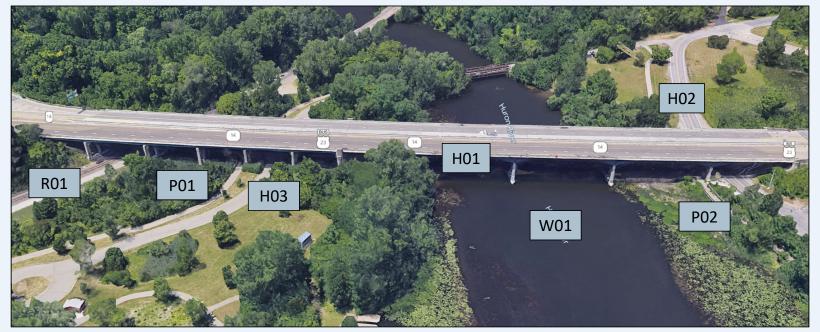
March 2022

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TOC Condensed TOC Expanded

How many Feature Types?





M-14 & US 23 BR over MDOT RR & Huron River

MDOT University Region

SNBI Impacts: Open, Posted or Closed to Traffic

SI&A Item 41 Structure Open, Posted or Closed to Traffic

- Now "Load Posting Status" (Item B.PS.01)
- Based on if structure is permanent, temporary, or supported

Table 15. Load Posting Status Codes.									
	No restriction			Posted or restricted				Classed	
	New	Open	Needs Action	Weight	Other	Needs Reduction	Missing	Closed	
Permanent	N	PO	PA	PP	PR	PD	PM	С	
Temporary		TO	TA	TP	TR	TD	TM	С	
Supported		SO	SA	SP	SR	SD	SM	С	

SNBI Impacts: Action Required

SNBI load rating compliance issues

- Agencies impacted will receive notification via email
- Approximately two years to resolve

Options to resolve SNBI load rating compliance issues

- 1. Enter or correct the data in MiBRIDGE
 - Associated documentation must be saved in MiBRIDGE
 - All current load rating requirements must be met
- 2. Perform an updated load rating



Conversion from SI&A Coding Guide to SNBI:

- Populate Item B.LR.03 with....
- Action required if...

SNBI Impacts: Load Rating Date

		5.1	L – LOADS AND LOAD RATIN	1G
Load Rating Date				
<u>Format</u> YYYYMMDD	<u>Frequ</u>	<u>uency</u> I	<u>Item ID</u> B.LR.03	
Specification		Commentary		
Report the date of the most recent load rating.		This item reflects the date of the most recent calculation or reevaluation of the load rating.		
Do not report this item if no rating analysis or evaluation has been performed		_	may be performed and at a different date than the	



Conversion from SI&A Coding Guide to SNBI:

- Populate Item B.LR.03 with the "Checked By Date" from the load rating summary
- Action required if "Checked By Date" is blank

SNBI Impacts: Load Rating Method

		Load Ratii	ng M	lethod	
Format Freque AN (4)			<u>uency</u> I		Item ID B.LR.04
	Specification	'			Commentary
Report the method used to calculate the load rating using one of the following codes. Code Description		Whe rate ratir ratir	NBI Item	(SI&A) INVENTORY CODING: 63 - Operating Rating Method: 64F - Federal Operating Rating:	
LFR ASR	Allowable Stress Rating		For		em 64MA - Michigan Operating Metho em 64MB - Michigan Operating Rating
LRFR			metl men		em 64MC - Michigan Operating Kathi em 64MC - Michigan Operating Truck
version from SI&A Coding Guide to SNBI: • Populate Item B.LR.04 with NBI Item 63					65 - Inventory Rating Method: 66 - Federal Inventory Rating:

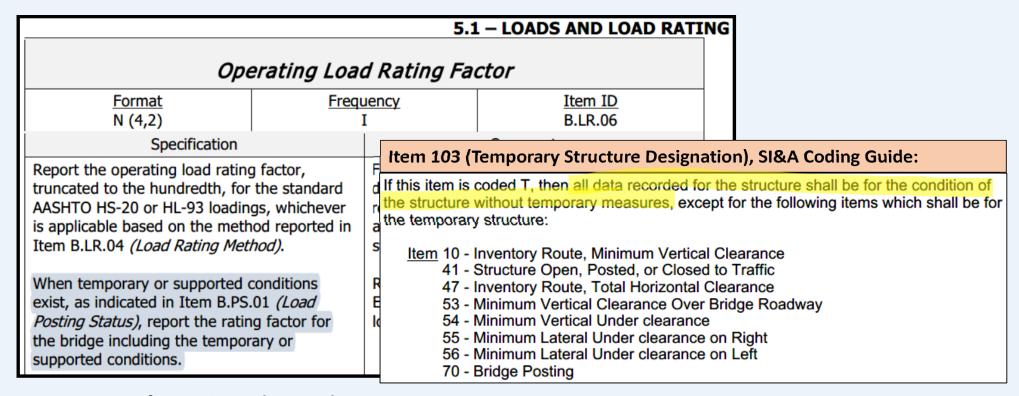
SNBI Impacts: Inventory Load Rating Factor

5.1 – LOADS AND LOAD RATING Inventory Load Rating Factor **Format** Frequency Item ID N(4,2)B.LR.05 Specification Item 103 (Temporary Structure Designation), SI&A Coding Guide: Report the inventory load rating factor, d If this item is coded T, then all data recorded for the structure shall be for the condition of truncated to the hundredth, for the standard the structure without temporary measures, except for the following items which shall be for AASHTO HS-20 or HL-93 loadings, whichever the temporary structure: is applicable based on the method reported in Item B.LR.04 (Load Rating Method). Item 10 - Inventory Route, Minimum Vertical Clearance 41 - Structure Open, Posted, or Closed to Traffic When temporary or supported conditions 47 - Inventory Route, Total Horizontal Clearance exist, as indicated in Item B.PS.01 (Load 53 - Minimum Vertical Clearance Over Bridge Roadway Posting Status), report the rating factor for 54 - Minimum Vertical Under clearance the bridge including the temporary or 55 - Minimum Lateral Under clearance on Right 56 - Minimum Lateral Under clearance on Left supported conditions. 70 - Bridge Posting

Conversion from SI&A Coding Guide to SNBI:

- Populate Item B.LR.05 with NBI Item 66, divided by 36 if reported in Tons
- Action required if NBI Item 66 reported for the unsupported condition

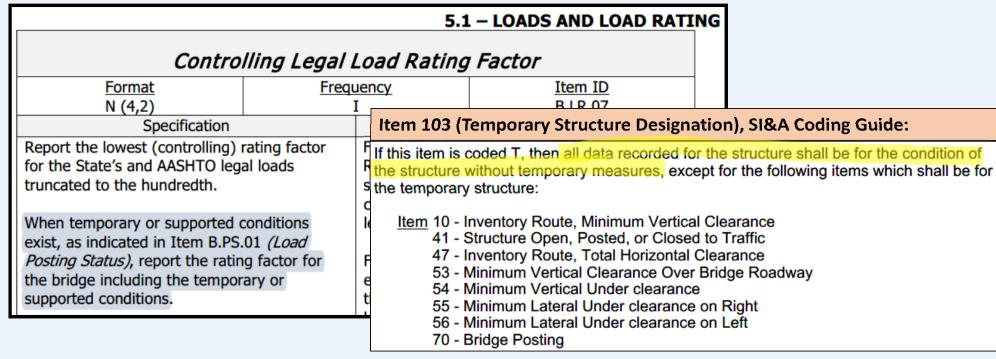
SNBI Impacts: Operating Load Rating Factor



Conversion from SI&A Coding Guide to SNBI:

- Populate Item B.LR.06 with NBI Item 64F, divided by 36 if reported in Tons
- Action required if NBI Item 64F reported for the unsupported condition

SNBI Impacts: Controlling Legal Load Rating Factor



Conversion from SI&A Coding Guide to SNBI:

- Populate Item B.LR.07 with MDOT Item 64MB
- Action required if MDOT Item 64MB reported for the unsupported condition
- Action required if MDOT Item 64MB reported in tons

SNBI Impacts: Routine Permit Loads

		5.1	. – LOADS AND LOAD RATIN	١G
Routine Permit Loads				
<u>Format</u>	Frequ	uency	Item ID	
AN (1)	I		B.LR.08	
Specification		Commentary		
Report whether the bridge carries routine permit loads or whether routine permit loads are restricted from the bridge using one of the following codes.		State routine point load rating a identify bridges	ed to identify bridges where ermit loads must be considered and posting evaluations and to where routine permit loads ue to bridge load capacity	
<u>Code</u> <u>Description</u>		limitations.	. ,	

Routine permit load: A live load, which has a gross weight, axle weight, or distance between axles not conforming with State statutes for legally configured vehicles, authorized for unlimited trips over an extended period of time to move alongside other heavy vehicles on a regular basis.

SNBI Impacts: Routine Permit Loads

MAXIMUM ALLOWABLE GROSS AXLE LOADINGS						
Spacing Between	Normal Loadings W	/hen Seasonal Load	Seasonal Load Limitations			
Axles	Limitations Ar	e Not In Force	(Speed Limit 35 MPH)			
	Vehicles Exceeding		Rigid	Elexible		
	80,000 lbs. Gross Weight	lbs. OR Under Gross Weight	25% / 7	duction		
9 feet or over	18,000 lbs.	20,000 lbs.	13,	ıbs.		
More than or equal to 3 ½ feet but less than 9 feet	13,000 lbs.		9,750	∂0 lbs.		
When part of a tandem axle assembly	*16,000 lbs.	34,000 lbs. on tandem	**12,00	400 lbs.		
When less than 3 ½ feet	9,000 lbs.		6, \	ıbs.		
Maximum load on any wheel shall not exceed: (lbs. per inch of tire width)	700 lbs.	700 lbs.	525	J lbs.		

[†] Gross vehicle weight may not exceed 80,000 lbs. and the Bridge Gross Weight Formula as follows: An overall gross weight on a group of 2 or more consecutive axles equaling: W = 500 [(LN /(N - 1)) + 12N + 36]

MDOT Form T-1: Maximum Legal Truck Loadings and Dimensions

Michigan Vehicle Code: http://www.legislature.mi.gov/documents/mcl/pdf/mcl-act-300-of-1949.pdf

mdotcf.state.mi.us/public/webforms/public/T-1.pdf

SNBI Impacts: Routine Permit Loads

SNBI Item B.LR.08 Coding:

Code	Description
А	Bridge carries routine permit loads. Load capacity is adequate for all routine permit loads; no routine permit loads are restricted.
В	Bridge carries routine permit loads. Load capacity is adequate for some routine permit loads but some routine permit loads are restricted.
С	Bridge does not carry routine permit loads. Routine permit loads are restricted from the bridge.
N	Bridge does not carry routine permit loads. Agency does not issue routine permits.



Conversion from SI&A Coding Guide to SNBI:

- None
- · Action required for every bridge in inventory



Does your Agency issue routine permits?

- Exceed maximum allowable axle loading
- Unlimited number of trips, extended time
- Unrestricted travel with other vehicles

Load Rating Resources



CTT:

http://loadrating.michiganItap.org/



Michigan Department of Transportation

MDOT:

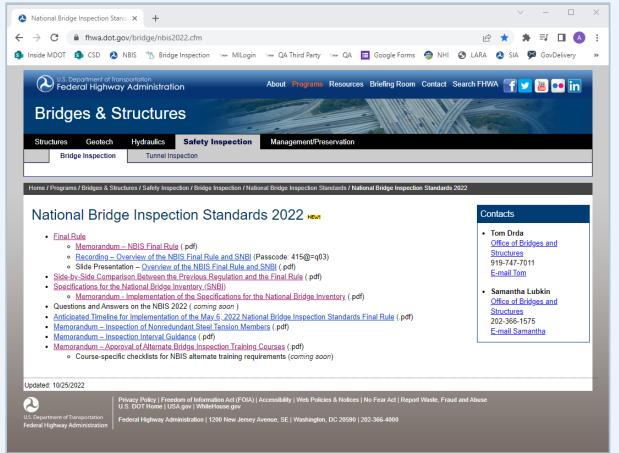
https://www.michigan.gov/mdot/programs/bridg es-and-structures/structure-preservation-andmanagement/load-rating



FHWA:

https://www.fhwa.dot.gov/bridge/loadrating

Q&A – Resources



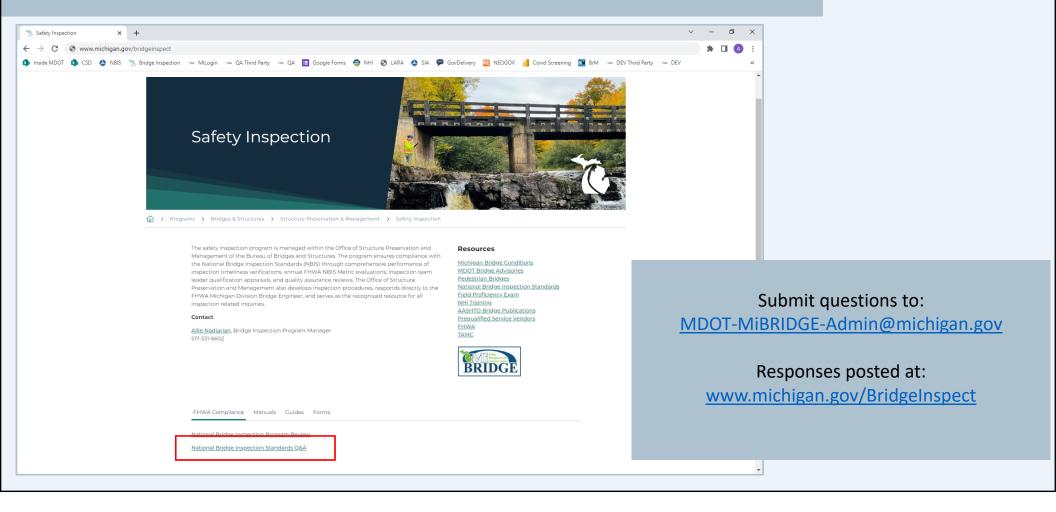
NBIS:

https://www.fhwa.dot.gov/bridge/nbis2022.cfm

SNBI:

https://www.fhwa.dot.gov/bridge/snbi.cfm

Q&A – Resources



Questions?

