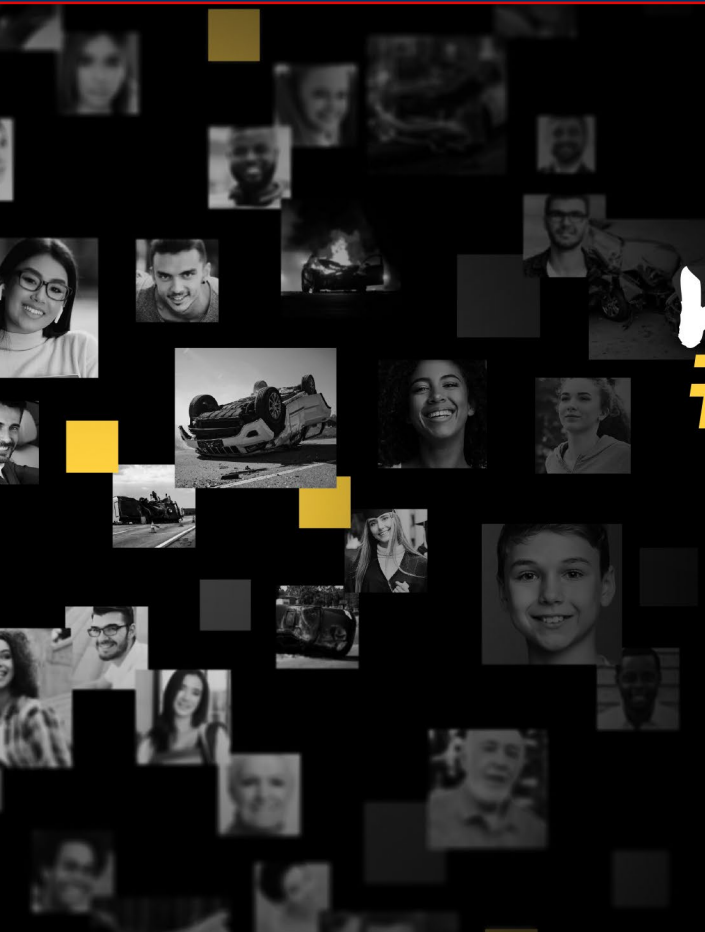
Life after NBIS Updates and SNBI Implementation

Texas Department of Transportation

April 17, 2025



HELP #EndTheStreakTX

End the streak of daily deaths on Texas roadways.

TxDOT.gov
#EndTheStreakTX Toolkit

Updated Fields

- The "SNBI" transition can be thought of as an update to our current processes
- It is NOT a brand new inspection program, it's just a new way of collecting and using data
- Requires updating the names of fields, forms, and inspection types
- Many of the current fields we use can be transitioned straight to the new "SNBI" fields

SUBSECTION 1.1: IDENTIFICATION

Item ID	Data Item
B.ID.01	Bridge Number
B.ID.02	Bridge Name
B.ID.03	Previous Bridge Number

SUBSECTION 1.2: LOCATION

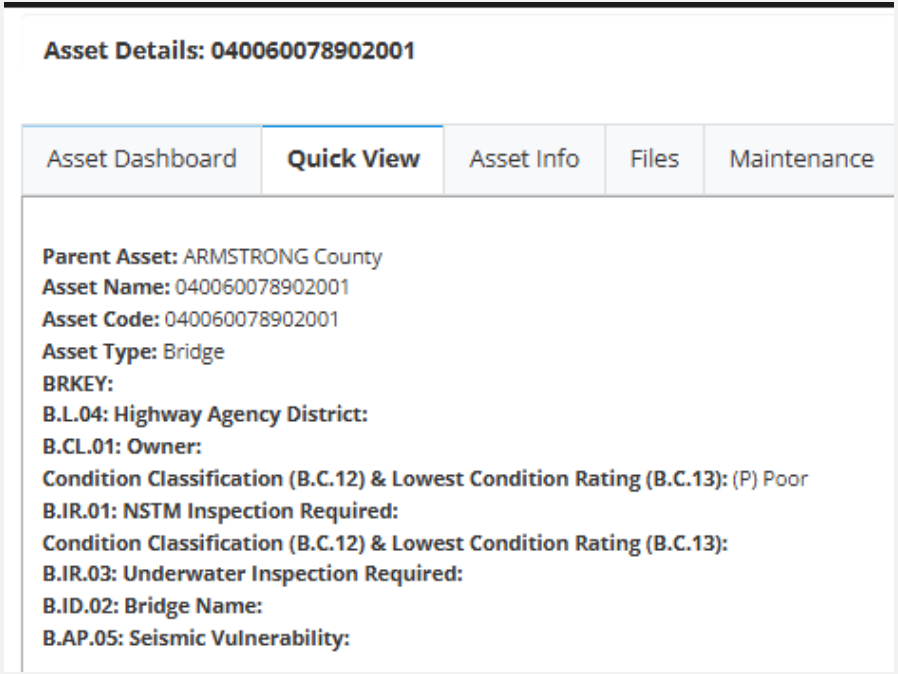
Item ID	Data Item
B.L.01	State Code
B.L.02	County Code
B.L.03	Place Code
B.L.04	Highway Agency District
B.L.05	Latitude
B.L.06	Longitude
B.L.07	Border Bridge Number
B.L.08	Border Bridge State or Country Code
B.L.09	Border Bridge Inspection Responsibility
B.L.10	Border Bridge Designated Lead State
B.L.11	Bridge Location
B.L.12	Metropolitan Planning Organization

SUBSECTION 1.3: CLASSIFICATION

Item ID	Data Item
B.CL.01	Owner
B.CL.02	Maintenance Responsibility
B.CL.03	Federal or Tribal Land Access
B.CL.04	Historic Significance
B.CL.05	Toll
B.CL.06	Emergency Evacuation Designation

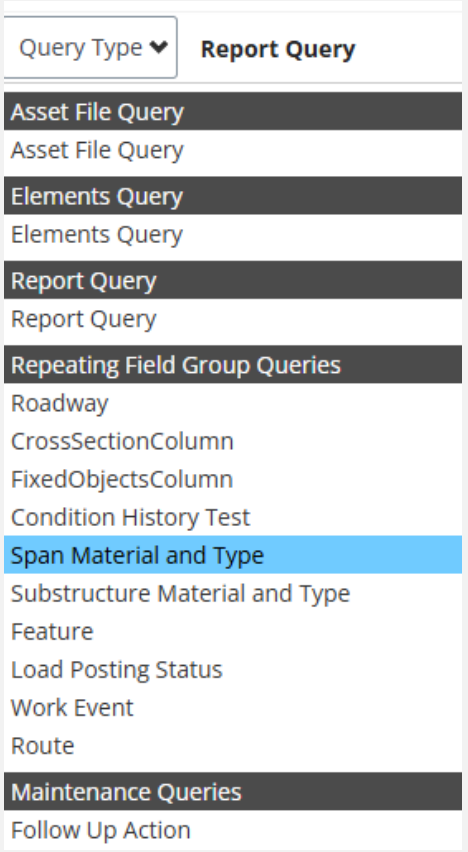
Updated Fields

- New fields will need to be mapped to:
  - Quick view page
  - Forms
  - Widgets
  - Follow Up Actions
  - Dashboards (Tableau / ESRI, etc)



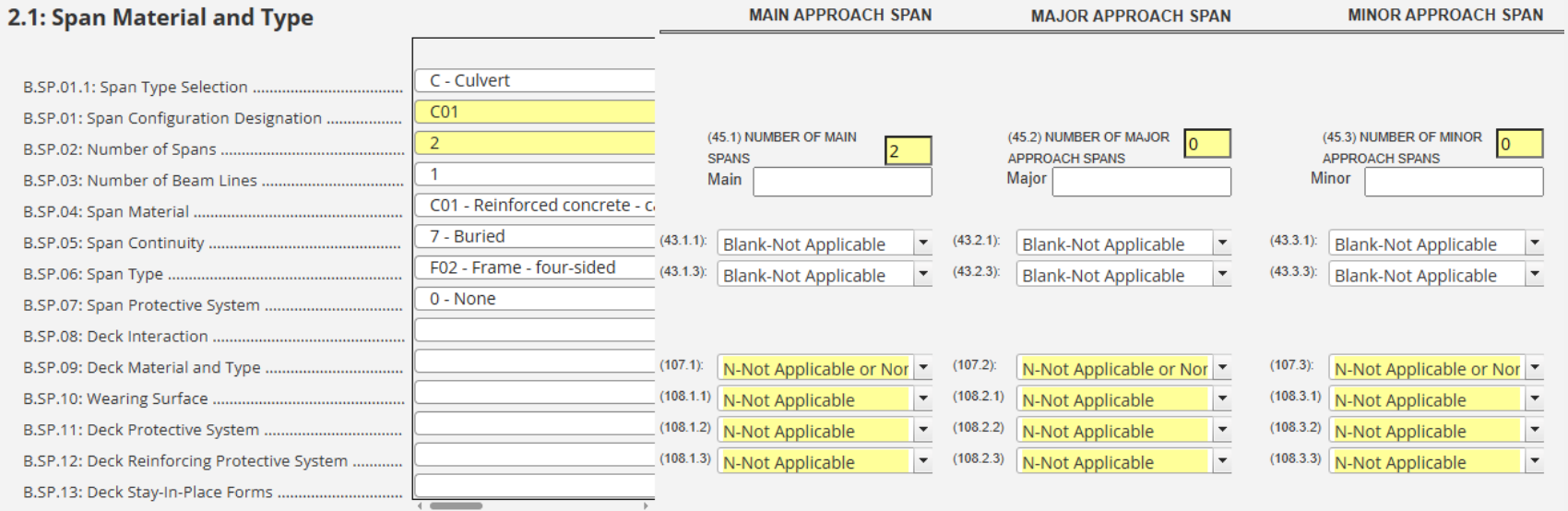
Repeating Field Groups

- In the current system, nearly all fields have a 1:1 relationship with the bridge
  - 1 value per bridge
- The SNBI introduces more many-to-one relationships with fields
  - These are called “Repeating Field Groups”
  - Multiple field values per bridge



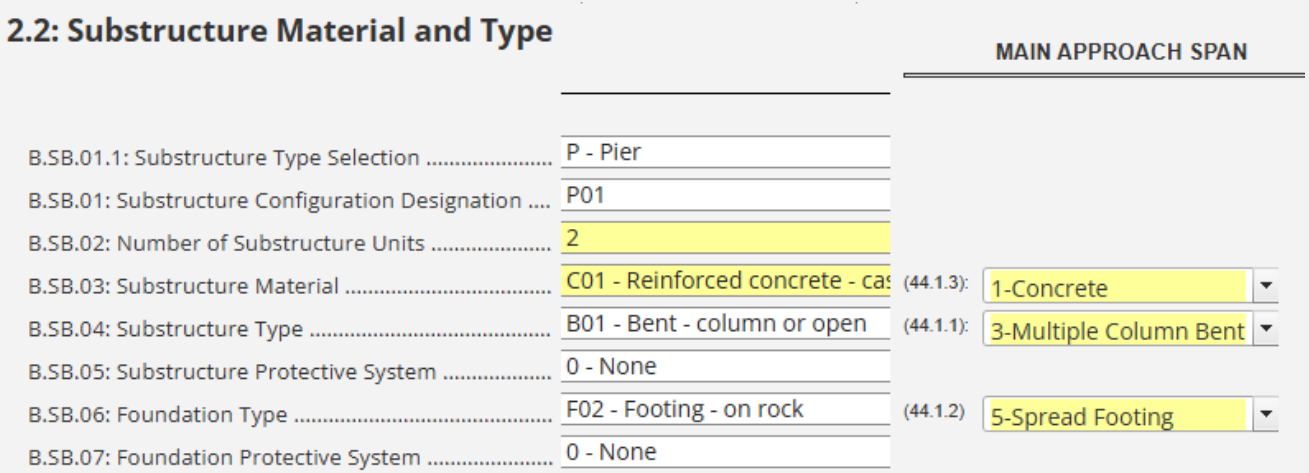
Repeating Field Groups

- Span Datasets are similar to what we have already collected for the superstructure and deck
- There is a possibility for more datasets than just the 1 Main, 1 Major, and 1 Minor spans



Repeating Field Groups

- Substructure Datasets are more granular than what we have collected in the past and will now be reported to the FHWA
- There is a possibility for more than just the 1 Main, 1 Major, and 1 Minor spans



2.2: Substructure Material and Type

			MAIN APPROACH SPAN
B.SB.01.1: Substructure Type Selection	P - Pier		
B.SB.01: Substructure Configuration Designation	P01		
B.SB.02: Number of Substructure Units	2		
B.SB.03: Substructure Material	C01 - Reinforced concrete - cas	(44.1.3):	1-Concrete
B.SB.04: Substructure Type	B01 - Bent - column or open	(44.1.1):	3-Multiple Column Bent
B.SB.05: Substructure Protective System	0 - None		
B.SB.06: Foundation Type	F02 - Footing - on rock	(44.1.2)	5-Spread Footing
B.SB.07: Foundation Protective System	0 - None		

More Data

- When all our bridges are eventually coded by via the SNBI, we will have a more detailed bridge database

2.1: Span Material and Type

B.SP.01.1: Span Type Selection	M - Main	A - Approach	A - Approach
B.SP.01: Span Configuration Designation	M01	A01	A02
B.SP.02: Number of Spans	4	4	1
B.SP.03: Number of Beam Lines	5	5	9
B.SP.04: Span Material	S02 - Steel - welded sha	C03 - Prestressed concı	C03 - Prestressed concı
B.SP.05: Span Continuity	2 - Continuous	1 - Simple or single spa	1 - Simple or single spa
B.SP.06: Span Type	G02 - Girder/beam - I-sl	G02 - Girder/beam - I-sl	B02 - Box girder/beam
B.SP.07: Span Protective System	P01 - Patina - uncoated	0 - None	0 - None
B.SP.08: Deck Interaction	CU - Composite - unshc	CU - Composite - unshc	CU - Composite - unshc
B.SP.09: Deck Material and Type	C01 - Reinforced concre	C01 - Reinforced concre	C01 - Reinforced concre
B.SP.10: Wearing Surface	0 - None	0 - None	0 - None
B.SP.11: Deck Protective System	0 - None	0 - None	0 - None
B.SP.12: Deck Reinforcing Protective System	0 - None	0 - None	0 - None
B.SP.13: Deck Stay-In-Place Forms	C02 - Concrete - prestre	C02 - Concrete - prestre	0 - None

- TxDOT already collects fairly granular data about member type and configuration compared to the current NBI

SNBI VS NBI

- NBI Fields:
  - Route Carried and Feature Intersected (Items 7 and 6), Under Records
  - Type of Service (Items 42.1 and 42.2)

1 - Highway, with or w/out pedestrian
2 - Railroad
3 - Pedestrian - bicycle
4 - Highway - railroad
5 - Waterway
6 - Highway - waterway
7 - Railroad - waterway
8 - Highway - waterway - railroad
9 - Relief for waterway
0 - Other

- SNBI Fields:
  - These fields now have a many to one relationship with the bridge, and have multiple iterations
  - Route Carried is a combination of:
    - B.F.01 = H (H for Highway)
    - B.F.02 = C (C for Carried on Bridge)
    - Then B.F.03 = “Feature Name”
  - If B.F.01 ≠ H or B.F.02 ≠ C than this is not the Route carried on the bridge!

SNBI VS NBI

- Example Bridge goes over U-Turn, the Colorado, Waters St (with sidewalk), and carried SH21/71 and separated pedestrian path

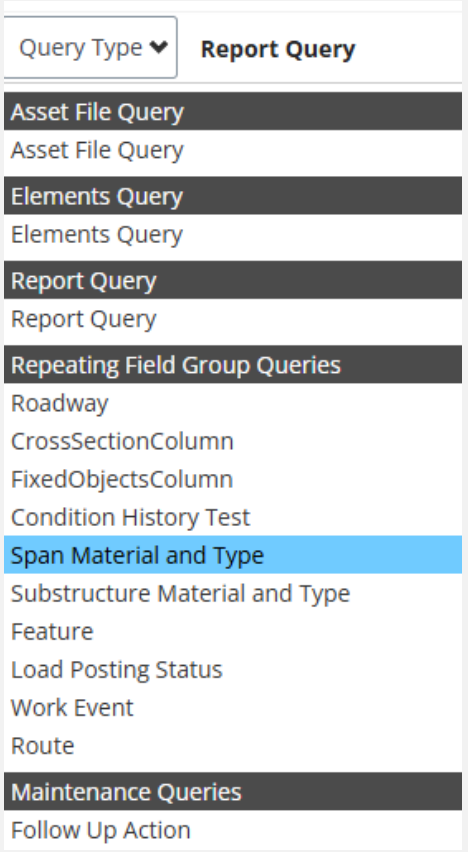
SNBI VS NBI

- Example Bridge goes over U-Turn, the Colorado, Waters St (with sidewalk), and carried SH21/71 and separated pedestrian path

4.1: Feature Identification					
B.F.01.1: Feature Type Selection	H - Highway	H - Highway	H - Highway	W - Waterway	P - Pathway
B.F.01: Feature Type	H01	H02	H03	W01	P01
B.F.02: Feature Location	C - Carried on bridge	B - Below bridge	B - Below bridge	B - Below bridge	C - Carried on bridge
B.F.03: Feature Name	SH 21 / SH 71 WBFR	U Turn	Water St	COLORADO RIVER	Sidewalk on SH21
4.3: Highways					
B.H.01: Functional Classification	5 - Major Collector	7 - Local	7 - Local		
B.H.02: Urban Code	05464	05464	05464		
B.H.03: NHS Designation	N - Non-NHS	N - Non-NHS	N - Non-NHS		
B.H.04: National Highway Freight Network	1-T - TEMP - NHFN - 1 o	N - Not on the NHFN	N - Not on the NHFN		
B.H.05: STRAHNET Designation	2 - STRAHNET Connecto	N - Not a STRAHNET rou	N - Not a STRAHNET rou		
B.H.06: LRS Route ID	SH0021-XG	SH0021-TA	1023149		
B.H.07: LRS Mile Point	41.696	0.016	0.159		
B.H.08: Lanes on Highway	3	1	2		
B.H.09: Annual Average Daily Traffic	4858	100	274		
B.H.10: Annual Average Daily Truck Traffic	233	1	8		
B.H.11: Year of Annual Average Daily Traffic	2023	2023	2023		

Query Updates

- Repeating Field Groups
  - Each bridge may have multiple instances of the same field, each with different values, coded
  - Span datasets (beam material / type, deck material / type), Substructure datasets (bent material / type, foundation material / type), and “Features” can all have the same field coded with multiple values for the same bridge



Query Updates

- Repeating Field Groups
  - Queries will return multiple rows per bridge
  - Only one Repeating Field Group can be queried at a time

Search Results: 3 results found.

Export Results To Excel | Export Results To CSV

Results

Parent Asset	Asset Name	B.SP.01.1: Span Type Selection	B.SP.01: Span Configuration Designation	B.SP.02: Number of Spans	B.SP.03: Number of Beam Lines	B.SP.04: Span Material	B.SP.05: Span Continuity	B.SP.06: Span Type	B.SP.07: Span Protective System
District 14 - Austin - BASTROP - 11	140110026504135	M	M01	4	5	S02	2	G02	P01
District 14 - Austin - BASTROP - 11	140110026504135	A	A01	4	5	C03	1	G02	0
District 14 - Austin - BASTROP - 11	140110026504135	A	A02	1	9	C03	1	B02	0

SNBI Scour Update

- NBI Fields
  - Scour Critical Bridges = Item 113
  - Options are:

N - Not over waterway
U - Unknown foundation and lacking scour evaluation and/or documentation
T - Over tidal waters and lacking scour evaluation and/or documentation
9 - All foundation components above flood waters
8 - Minimal foundation exposure
7 - Countermeasures installed and performing well
6 - Lacking scour evaluation and/or documentation
5 - Moderate foundation exposure (calculated)
4 - Moderate foundation exposure (observed)
3 - Major foundation exposure (calculated)
2 - Major foundation exposure (observed)
1 - Failure is imminent and bridge is closed to traffic
0 - Failure has occurred and bridge is closed to traffic

- SNBI Fields
  - Scour Vulnerability = B.AP.03
    - B for Bridge, AP for Appraisal, 03 because it's the third Appraisal item
  - Options are:

Code	Description
0	Scour appraisal has not been completed.
A	Scour appraisal completed. Bridge determined to be stable for scour.
B	Scour appraisal completed. Bridge determined to be stable for scour, dependent upon designed, and functioning countermeasures.
C	Scour appraisal completed. Bridge could become unstable for scour. Temporary (not designed) countermeasure installed to mitigate scour. Bridge is scour critical.
D	Scour appraisal completed. Bridge is, or may become, unstable for scour. Bridge is scour critical.
E	Scour appraisal has not been completed. Temporary (not designed) countermeasure installed to mitigate scour.
U	Scour appraisal has not been completed due to unknown foundations.

SNBI Scour Update

- SNBI Fields
  - Scour Plan of Action = B.AP.04

Code	Description
0	A scour POA is not required.
N	A scour POA is required, but not implemented.
Y	A scour POA is required and implemented.

- TxDOT Fields
  - Scout Plan of Action = 113.1

- SNBI Fields
  - Scour Condition Rating = B.C.11

Code	Condition Description
N	Bridge does not cross over water.
9	No scour.
8	Insignificant scour.
7	Some minor scour.
6	Widespread minor or isolated moderate scour.
5	Moderate scour; strength and stability of the bridge are not affected.
4	Widespread moderate or isolated major scour; strength and/or stability of the bridge is affected.
3	Major scour; strength and/or stability of the bridge is seriously affected. Condition typically necessitates more frequent monitoring, load restrictions, and/or corrective actions.
2	Major scour; strength and/or stability of the bridge is severely compromised. Condition typically necessitates frequent monitoring, significant load restrictions, and/or corrective actions to keep the bridge open.
1	Bridge is closed to traffic due to scour condition. Channel rehabilitation may return the bridge to service.
0	Bridge is closed due to scour condition, and is beyond corrective action. Bridge replacement is needed to restore service.

Load Rating Updates

- The load posting status now shows the current status and previous status' – and when they were updated
- Load Rating factors will be reported to FHWA

5.2: Load Posting Status

B.PS.01.1: Load Posting Status - Structure	P - Permanent
B.PS.01.2: Load Posting Status - Restriction	P-N - No Restriction
B.PS.01: Load Posting Status	PO - Open
B.PS.02: Posting Status Change Date	02/18/2025

5.3: Load Evaluation and Posting

	B.EP.01: Legal Load Configuration	B.EP.02: Legal Load Rating Factor
Legal Vehicles	(3) Type 3	1.85
	(3S2) Type 3S2	1.89
	(3-3) Type 3-3	2.25
Specialized Hauling Vehicles (SHV)	(SU4) SU4 truck	1.53
	(SU5) SU5 truck	1.40
	(SU6) SU6 truck	1.29
	(SU7) SU7 truck	1.25
Emergency Vehicles	(EV2) Type EV2 emergency vehicle	1.68
	(EV3) Type EV3 emergency vehicle	1.08
	(NRL) Notional Rating Load	1.23

Load Rating Updates

- The most recent Load Posting Status is the Current Status
- This is similar to item 41, but there could be multiple status changes in short period of time

5.2: Load Posting Status

B.PS.01.1: Load Posting Status - Structure	P - Permanent	P - Permanent	P - Permanent
B.PS.01.2: Load Posting Status - Restriction ...	P-P - Posted or restricted	P-P - Posted or restricted	P-P - Posted or restricted
B.PS.01: Load Posting Status	PA - Needs Action	PP - Weight	PM - Missing
B.PS.02: Posting Status Change Date	04/01/2024	04/02/2025	04/03/2025

Results

Parent Asset	Asset Name	B.PS.01.1: Load Posting Status - Structure	B.PS.01.2: Load Posting Status - Restriction	B.PS.01: Load Posting Status	B.PS.02: Posting Status Change Date
TXDOTTESTDISTRICT	TXDOTTESTASSET1*	P - Permanent	P-P - Posted or restricted	PA - Needs Action	04/01/2024
TXDOTTESTDISTRICT	TXDOTTESTASSET1*	P - Permanent	P-P - Posted or restricted	PP - Weight	04/02/2025
TXDOTTESTDISTRICT	TXDOTTESTASSET1*	P - Permanent	P-P - Posted or restricted	PM - Missing	04/03/2025

FHWA Data Validation Logic

- The FHWA has provided the list of errors they are checking for when we submit our annual data

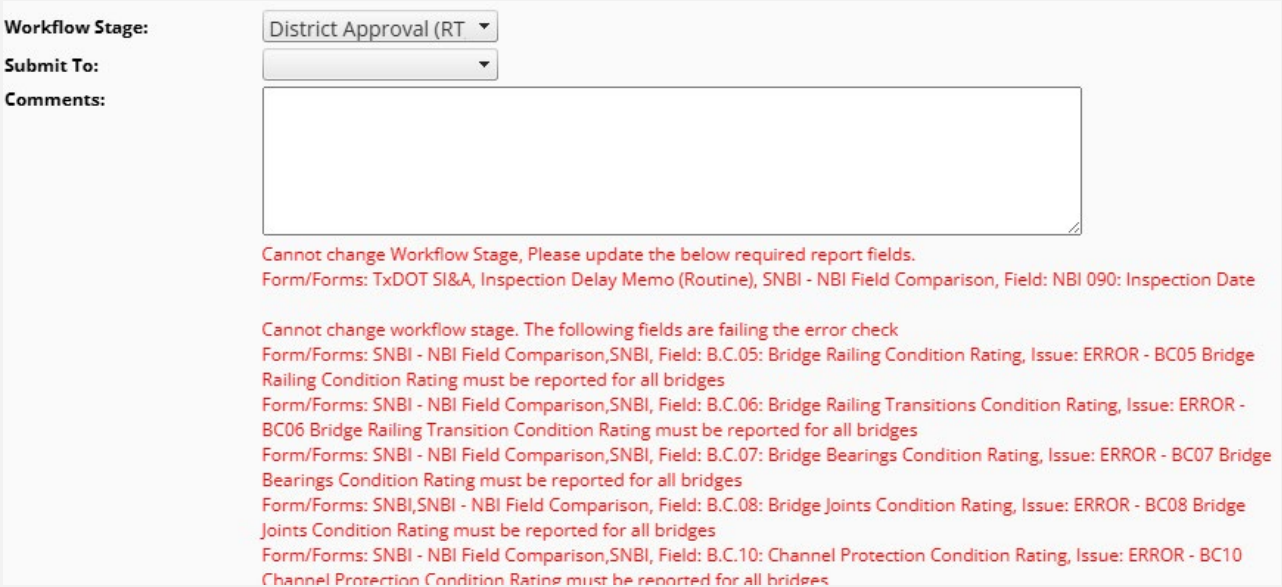
Critical	B.ID.01	BID01	BID01-01	Bridge Number	Bridge Number is null	Must be reported and checked for duplicate values	
Critical	B.ID.01	BID01	BID01-02	Bridge Number	Bridge Number length exceeds 15 characters	Data length check	Max 15
Critical	B.ID.01	BID01	BID01-03	Bridge Number	Bridge Number contains invalid characters. Valid characters include A-Z, a-z, 0-9, spaces, periods, and the symbols * & _ ( ) - +	Data format check	Valid characters include A-Z, a-z, 0-9, spaces, symbols * & _ ( ) - +
Error	B.ID.02	BID02	BID02-1	Bridge Name	Bridge name length exceeds 300 characters	Data length check	Max 300
Flag	B.ID.02	BID02	BID02-2	Bridge Name	Missing bridge name	Optional, but FHWA prefers a general description of the bridge when a commonly known name is unavailable	If common bridge name is not available -provic description
Flag	B.ID.03	BID03	BID03-1	Previous Bridge Number	Previous bridge number is null. Report 0 if no previous bridge number	Must have value or 0	Not null or 0
Error	B.ID.03	BID03	BID03-2	Previous Bridge Number	Previous bridge number length exceeds 15 characters	Data length check	Max 15
Error	B.ID.03	BID03	BID03-3	Previous Bridge Number	Previous bridge number contains invalid characters. Valid characters include A-Z, a-z, 0-9, spaces, periods, and the symbols * & _ ( ) - +	Data format check	Valid characters include A-Z, a-z, 0-9, spaces, symbols * & _ ( ) - +
Flag	B.ID.03	BID03	BID03-4	Previous Bridge Number	Previous bridge number should not be the same as Bridge Number BID01	BID03 <> BID01	
Critical	B.L.01	BL01	BL01-1	State Code	State code is null or not valid	Must be reported and checked for valid state code	State Codes listed in SNBI
Critical	B.L.01	BL01	BL01-2	State Code	State code does not match the selected state.	Wrong state code	State Codes listed in SNBI

AssetWise Error Check

- Use the "Error Check" form to check open reports against the FHWA errors
- Some issues are flags, some are critical errors
  - Critical errors stop the report from moving ahead in the workflow (cannot be submitted to district)

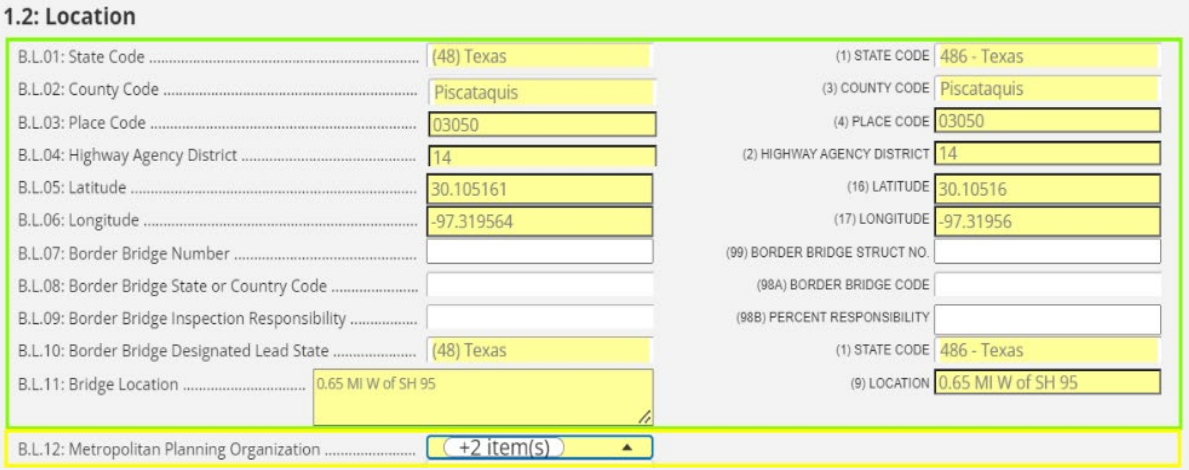
AssetWise Error Check

- When attempting to change the workflow of a report with errors, fields with issues will be identified
  - Issues in RED stop the report from moving ahead in the workflow (cannot be submitted to district)



SNBI Transition

- About 600 new bridges added to the inventory each year, these won't have any unique NBI fields populated, only SNBI fields
  - Data pulls from new bridges will need to focus on SNBI fields only
- Existing bridges will have current SNBI data populated, and old NBI data will remain (but may not be reliable due to changes in condition)
  - Data pulls from existing bridges will need to focus on SNBI fields only



Discontinued Fields

- From FHWA presentation on the SNBI transition:

Discontinued from Coding Guide

- FHWA Region Code (1B)
- Base Highway Network (12)
- Structure Flared (35)
- Approach Guardrail (36C)
- Approach Guardrail Ends (36D)
- Structural Evaluation (67)
- Deck Geometry (68)
- Underclearances, Vt. & Hz. (69)
- Work Done By (75B)
- Length of Structure Improvement (76)
- Bridge Improvement Cost (94)
- Roadway Improvement Cost (95)
- Total Project Cost (96)
- Year of Improvement Cost Estimate (97)
- Parallel Structure Designation (101)
- Future Average Daily Traffic (114)
- Year of Future Average Daily Traffic (115)
- Sufficiency Rating Asterisk
- Sufficiency Rating
- Status (SD, FO, Not deficient, Not applicable)

Next Steps

- Update transitioned data during bridge inspection process and fill in the blanks
- Update forms, manuals, contracts, processes to refer to SNBI data only
  - Currently inspection consultants are collecting both sets of data!
- Update dashboards and data connections
- Finalize and error check data to submit to FHWA by 2028!