



# Memorandum

Subject: **ACTION**: Implementation of the Specifications  
for the National Bridge Inventory

Date: May 25, 2022

In Reply Refer To: HIBS-30

From: Joseph L. Hartmann, Ph.D., P.E.  
Director, Office of Bridges and Structures

JOSEPH  
LAWRENCE  
HARTMANN

Digitally signed by JOSEPH  
LAWRENCE HARTMANN  
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To: Division Administrators  
Federal Lands Highway Division Directors

## Purpose

The purpose of this Memorandum is to outline the process by which the Federal Highway Administration (FHWA) will transition the data reported to the National Bridge Inventory (NBI) from alignment with the *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges* (Coding Guide) to the *Specifications for the National Bridge Inventory* (SNBI). Implementation of the SNBI will necessitate development of new database systems, updates to procedures, and training for inspectors and database managers, among other actions. This Memorandum specifically addresses the requirements<sup>1</sup> associated with data collection and submittal activities before, during, and after the transition period to the SNBI. Details of the transition process and associated data collection and submittal requirements are outlined below.

## Background

FHWA provides oversight of highway bridge safety by implementation of the National Bridge Inspection Standards (NBIS), which are required by statute (23 U.S.C. 144) and defined in regulation (23 CFR part 650 Subpart C). An update to the NBIS was published in the Federal Register on May 6, 2022.

The SNBI was developed in coordination with the update to the NBIS regulation, the American Association of State Highway and Transportation Officials (AASHTO) Manual for Bridge Evaluation (MBE), the AASHTO Manual for Bridge Element Inspection (MBEI), and the FHWA Bridge Inspector's Reference Manual (BIRM). The SNBI is incorporated by reference in 23 CFR 650.317 and provides the specifications for reporting data for highway bridges open to the public to FHWA for inclusion in the NBI. The SNBI supersedes the Coding Guide. FHWA is developing an updated database system (NBI NextGen) to accommodate the data changes inherent to the SNBI and modernize the data submittal and validation process, while retaining the legacy data collected in accordance with the Coding Guide.

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<sup>1</sup> 23 CFR 650.315

Element-level data for bridges on the National Highway System (NHS), as required by 23 U.S.C. 144, have been reported to FHWA since April 2015. The 2014 FHWA Specification for the National Bridge Inventory Bridge Elements (SNBIBE) addressed the reporting of element-level data to FHWA. The SNBIBE has been incorporated into the SNBI to provide a single specification document for all bridge-related data reported to FHWA for inclusion in the NBI.

In developing the SNBI, the following practical purposes were considered:

- Ensuring highway bridge safety
- Enabling oversight of the National Bridge Inspection Program (NBIP)
- Consistency with the updated NBIS
- Reporting to Congress
- Emergency response
- Administering risk-based, data-driven asset and performance management programs in accordance with 23 U.S.C. 150 (National Goals and Performance Management Measures), 23 CFR part 490, Subpart D (National Performance Management Measures for Assessing Bridge Condition), and 23 CFR part 515 (Asset Management Plans)
- Consistency with the Specifications for the National Tunnel Inventory (SNTI) and Highway Performance Monitoring System Field Manual, where appropriate
- Providing quality data through clarity and ease of use, thereby reducing the need for interpretation

### **Transition Timeline**

In developing the timeline for implementation of the SNBI and NBI NextGen, FHWA consulted with database technical experts and various members and organizations of the bridge community, and considered the annual data submittal schedule (no later than March 15<sup>th</sup> of each year) and comments that were received in response to the Notice of Proposed Rulemaking for the NBIS (84 FR 61494, November 12, 2019).

The approximately six-year comprehensive timeline outlined below is believed to be fair and reasonable given these considerations and the resources that will be provided by FHWA to aid in the transition. Key terms are described in detail following the timeline.

| Target Date     | Action   |
|-----------------|--|
| May 2022        | NBIS and SNBI published  |
| July 2022       | FHWA publishes Data Crosswalk  |
| October 2022    | FHWA publishes Data Submittal Schema and Data Submittal Validation Logic (Initial Version)   |
| April 2023      | Transition Tool is made available online   |
| October 2024    | FHWA makes NBI NextGen available online for data validation only   |
| March 15, 2025  | Last NBI data submittal in accordance with 1995 Coding Guide   |
| January 1, 2026 | <b>Last date to begin</b> verification of transitioned data and collection of SNBI-based data for inspected bridges – Agencies may elect to begin SNBI-based data collection and verification earlier to meet the March 15, 2028, deadline for submittal of a complete SNBI-based NBI dataset  |
| January 1, 2026 | FHWA makes NBI NextGen available for Data Submittals   |
| March 15, 2026  | First SNBI-based NBI data submittal – Transitioned/Hybrid Dataset – At a minimum, all bridges submitted with transitioned data except for specified fields required to manage FHWA programs, which shall be collected or verified in accordance with the SNBI – Continue verification of transitioned data and collection of SNBI-based data |
| June 2026       | Transition Tool sunsets  |
| March 15, 2027  | Second SNBI-based NBI data submittal – Transitioned/Hybrid Dataset – Continue verification of transitioned data and collection of SNBI-based data  |
| March 15, 2028  | Third SNBI-based NBI data submittal – 100% populated and verified – No temporary codes permitted – First complete SNBI-based dataset with collected and verified SNBI-based data for all bridges   |

**Data Crosswalk and Temporary Codes**

FHWA intends to make the Data Crosswalk available in July 2022 or before. It is a detailed mapping of the relationship between the Coding Guide data items and the SNBI data items. It establishes the rules for data transition, defines temporary codes to be used only during the transition period, and defines data tags to be used for SNBI-based data submittals. The Data Crosswalk consists of two spreadsheets, as follows:

1. The Primary Spreadsheet establishes the general relationships between the data items. It describes each item in the SNBI, including the item ID, submittal data tag, item name, and format. For each SNBI item, this spreadsheet goes on to fully describe related item(s) from the Coding Guide and whether and how the data transition cleanly into SNBI format. Transition notes are provided for database managers and developers that discuss methods and assumptions used to transition the data.
2. For data items that have a more complex relationship than can be fully described in the Primary Spreadsheet, the Detailed Spreadsheet provides specific information related to

the mapping of each code. In some cases, data may transition into temporary codes, which will need to be manually resolved into permanent codes in accordance with the established timeline. Temporary codes may be necessary in situations where a Coding Guide item does not transition into a single code but could transition into one of a small subset of SNBI codes. These temporary codes will be used to maintain continuity of information between the Coding Guide and the SNBI, which will allow for trend analyses, data comparison, and other data mining activities to continue unabated during and after the transition. They will also provide a starting point for population of the affected data fields. All temporary codes should be resolved into permanent codes during the transition period; no temporary codes will be accepted for the March 15, 2028, data submittal or thereafter.

### **Data Submittal Schema**

FHWA anticipates that the updated NBI data submittal schema will be made available by October 2022. It will define the submittal file format and requirements. The schema will be compatible with large database structure and nested data relationships.

### **Data Submittal Validation**

FHWA intends to make the logic for the majority of the NBI data validation checks available in October 2022 or before, though additional validation checks may be added after that date. The data validation tools for NBI NextGen submittals based on this logic are expected to be made available in October 2024, ahead of the remaining portions of the NBI NextGen system, to aid State transportation departments, Federal agencies, and Tribal governments (herein collectively referred to as “Agencies”) in developing their own data management systems. The data validation tools will be accessible via the [NBIS web page](#), and will not require UPACS<sup>2</sup> access.

Data validation may result in any of the following:

- Fatal errors, which prevent the file from processing.
- Critical errors, which prevent the file from being accepted. This includes duplicate records.
- General errors, which should be corrected to the extent possible prior to submittal, but no later than within one year. General errors that persist for more than two years will likely result in data rejection.
- Flags, which indicate data that may be erroneous and should be verified.

The NBI system will be designed to allow data validation and submittal with a single upload. However, if data validation results in fatal or critical errors; the system will not allow the file to be submitted for processing.

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<sup>2</sup> FHWA User Profile & Access Control System (UPACS)

## **Transition Tool**

FHWA plans to make the Transition Tool available on the [NBIS web page](#) in April 2023. It will be used to support Agencies in transitioning Coding Guide-based data and SNBIBE-based element data files into an SNBI-based data file in accordance with the logic outlined in the Data Crosswalk. This tool is intended to assist Agencies in understanding the relationship between the Coding Guide data items and the SNBI data items, and in initially populating their new bridge data systems. Agencies can upload legacy NBI and element data submittal files into the tool, and then download the transitioned data file; the transitioned file can then be uploaded into the Agency's new bridge data system.

The transitioned data is intended to be a starting point for data verification and future data collection; it is not intended that the data be transitioned multiple times, at any point after the 2026 data submittal, or without verification. The Transition Tool will remain available until June 2026 in case it is needed for troubleshooting, but it will sunset permanently at that time. Because NBI data are archived on June 15 and published soon after, it is not anticipated that the Transition Tool will be needed after that date. The transition may take place at any point before the 2026 data submittal.

For the 2026 submittal, data for all bridges may be transitioned data, except those items listed below, which must be populated for all bridges starting with the 2026 data submittal:

- Data items needed for FHWA to perform oversight of the NBIS and manage programs. To date, no such items have been identified that cannot be addressed through other means.
- Data items that support implementation of extended inspection intervals developed using Method 1, or reduced and extended inspection intervals developed using Method 2 as discussed in the next section.

During the first inspection cycle after the data have been transitioned, Agencies should verify that all data items have transitioned correctly for each bridge, update those that are not correct or that have temporary codes, and populate those that did not transition or are new items.

All transitioned data should be verified, and corrected if necessary, before the March 2028 NBI data submittal. All temporary codes should be updated to permanent codes before this date. All fields that cannot be populated by the Transition Tool should be populated before this date. The expectation is that the March 2028 NBI data submittal will be a complete and verified SNBI-based data submittal.

## **Bridges on Reduced and Extended Inspection Intervals**

Although collection of SNBI-based data is not required to begin until January 1, 2026, complete and verified data for all bridges, including those on inspection intervals greater than 24 months, should be included in the 2028 data submittal. FHWA recommends that each Agency develop a

plan to address the data for bridges currently on extended intervals such that they can meet this timeline. FHWA Division offices and FHWA Federal Lands Highway Division offices should monitor progress toward these plans to ensure that the deadline will be met. Note that extended inspection interval policies approved by FHWA under the previous regulation will be rescinded<sup>3</sup> on June 6, 2024.

The inspection interval implementation guidance provides a conservative method for using equivalent criteria per the Coding Guide to support Method 1<sup>4</sup>, a simplified, risk-based approach to determining inspection intervals for routine, underwater, and NSTM inspections. Agencies may choose to collect SNBI data items for bridges on reduced intervals during the first inspection after implementation, as some bridges may be relieved from the requirement for reduced intervals based on the data collected. Agencies that choose to do this must make the data available to FHWA for oversight (23 CFR 650.313 and 23 CFR 650.315). Agencies may also choose to use Method 2<sup>5</sup> to determine reduced or extended intervals, which allows for risk assessment by quantified statistical analysis, when possible, or by qualitative expert judgment. Agencies that choose to use Method 2 must also collect the relevant SNBI data items and make those data available to FHWA for oversight (23 CFR 650.313 and 23 CFR 650.315).

## **Future Developments**

Along with the general guidelines in this Memorandum, FHWA will provide additional resources as outlined in the timeline to assist Agencies in transitioning to the SNBI. These resources will be published on the [NBIS web page](#) as they become available.

FHWA will assist Agencies in this transition by timely providing information, tools, training, and guidance, as well as opportunities to assist with beta testing of the NBI NextGen system. FHWA intends to offer free training on the use and understanding of the SNBI beginning in early 2023.

FHWA intends to create a completely modernized process for data submittals. NBI NextGen data submittals will include all bridge data, including element data, in the same submittal. This will significantly streamline the submittal, review, and acceptance process, and will enable additional data validation across the two datasets, thereby minimizing errors and improving data quality.

Additionally, the aim is to build a system that requires data to be uploaded only once, for both data validation and submittal. To avoid large file upload issues, the system will include flexibilities whereby multiple partial files may be uploaded and compiled, then validated and submitted as a single file.

During the annual NBIP review, the March 15 NBI data submittal will continue to be assessed for data quality and timeliness, as described in the National Bridge Inspection Program Compliance

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<sup>3</sup> 23 CFR 650.311(g)(2)

<sup>4</sup> 23 CFR 650.311(a)(1), 650.311(b)(1), and 650.311(c)(1)

<sup>5</sup> 23 CFR 650.311(a)(2), 650.311(b)(2), and 650.311(c)(2)

Review Manual, April 2018, currently available on the [NBIS web page](#). The Manual will be updated to address the coming data changes and to align with the revised regulation.

It is FHWA's intent that the National Tunnel Inventory (NTI) will become a part of a single NBI/NTI system in the future, to enable mapping and querying across both datasets. The data submittal processes will likely remain separate for the two datasets, however.

## **Summary**

This memorandum provides a detailed outline of FHWA's intended approach to transitioning data in the NBI from alignment with the Coding Guide to the SNBI, and addresses the related requirements for Agencies. This Memorandum, the NBIS, SNBI, Data Crosswalk, data submittal schema, Transition Tool, and all other available documents and resources associated with implementation of the NBIS regulation and the SNBI will be posted on the [NBIS web page](#) as they become available.

Except for any statutes and regulations cited, the contents of this document do not have the force and effect of law and are not meant to bind Agencies or the public in any way. This document is intended only to provide clarity regarding existing requirements under the law or agency policies.

## **Additional Information**

Please share this memorandum with appropriate staff and with all appropriate Agency officials. Questions on the guidance can be directed to Everett Matias at (202) 366-1078 or [Everett.Matias@dot.gov](mailto:Everett.Matias@dot.gov), or to Samantha Lubkin at (202) 366-1575 or [Samantha.Lubkin@dot.gov](mailto:Samantha.Lubkin@dot.gov).

cc:

Directors of Field Services  
Director of Technical Services  
HIBS  
Peter Stephanos, HISM  
Brian Fouch, HICP