Idaho Technology Authority (ITA)

ENTERPRISE STANDARDS – S4000 – INFORMATION AND DATA

Category: S4228 – Idaho Bridge Data Standard

CONTENTS:

I. DEFINITION

See ITA Guideline G105 (ITA Glossary of Terms) for definitions.

II. RATIONALE

A statewide Bridge database is a critical source of information for community and economic development needs, infrastructure maintenance, research and analysis, homeland security, business development, public safety, and more. Many private sector and local, state, and federal government agencies have business needs for a Bridge Framework dataset.

III. APPROVED STANDARD(S)

See Attachment

IV. APPROVED PRODUCTS(S)

Any GIS Software, either desktop or online, capable of ingesting and displaying Open Geospatial Consortium (OGC) Web Map Standard (WMS) services.

V. JUSTIFICATION

A statewide Bridge dataset is a critical source of information as stated under 'II Rationale' in this standard. A data standard supports the use of the Bridge Layer to facilitate a predictable format, improve collaboration and encourage use of this dataset.

VI. TECHNICAL AND IMPLEMENTATION CONSIDERATIONS

Any GIS Software, either desktop or online, capable of ingesting and displaying Open Geospatial Consortium (OGC) Web Map Standard (WMS) services.

VII. EMERGING TRENDS AND ARCHITECTURAL DIRECTIONS

Data will be shared in accordance with ITA Standard S4250 –Geographic Information System (GIS) Data Sharing Standards.

VIII. PROCEDURE REFERENCE

The format, content, and development of this standard adhere to ITA Policy P5030 - Framework Standards, ITA Standard S4250 - Data Sharing Standards and ITA Standard S4220 - Geospatial Metadata.

IX. REVIEW CYCLE

Review will occur at least annually.

X. CONTACT INFORMATION

For more information, contact the ITA Staff at (208) 605-4064.

REVISION HISTORY

07/20/2023 – Standard Presented to the IGC-EC

STATE OF IDAHO

Idaho Bridge Data Standard

Part of the Transportation Theme

Version 1
Effective July 20, 2023

Developed by the Transportation Technical Working Group

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CONTENTS

1. Introduction to the Bridge Data Standard

A statewide Bridge database is a critical source of information for community and economic development needs, infrastructure maintenance, research and analysis, homeland security, business development, public safety, and more. Many private sector and local, state, and federal government agencies have business needs for a Bridge Framework dataset.

A Bridge Data Standard is intended to facilitate integration and sharing of up-to-date Bridge data, and enhance the dissemination and use of Bridge information. This standard does not instruct on how Bridge databases are designed for internal use.

This standard was developed by the Transportation Technical Working Group, a subgroup of the Idaho Geospatial Council – Executive Committee (IGC-EC). This standard will be reviewed on an annual basis and updated as needed.

1.1. Mission and Goals of the Standard

The Bridge Standard supports a statewide dataset that is consistent with applicable state and national standards. It establishes the minimum attributes and geospatial database schema for the Bridge Framework. The Standard will communicate with, and may have similar attributes to, other Idaho Framework data standards. It encourages all Idaho-based agencies with geospatial Bridge data to contribute to the Bridge Framework.

The Bridge Framework will be appropriately shared and beneficial to all. The fields in the Bridge Data Standard will be general enough to incorporate basic information without requiring major changes in internal data models. This standard allows for expansion to a more complex data structure and schema.

1.2. Relationship to Existing Standards

This Bridge Standard relates to existing standards as follows:

- Federal Geographic Data Committee (FGDC) Data Accuracy Standards
- While no standard in Idaho exists yet for roadways, bridges are referenced as events to a statewide LRS road network maintained by the Idaho Department of Transportation based on the routeID and measure attributes included in the schema of the Bridge Framework
- There are relationships with the national bridge inventory at the federal level.

Included in the attributes are items like structure name, location, and whether the bridge is considered in the NBI.

1.3. **Description of the Standard**

This standard describes the vision and geospatial data structure of a Bridge Framework in the state of Idaho. This standard is devised to be:

- Simple, easy to understand, and logical
- Uniformly applicable, whenever possible
- Flexible and capable of accommodating future expansions
- Dynamic in terms of continuous review

1.4. **Applicability and Intended Uses**

This standard applies to the Bridge element of the Transportation theme of The Idaho Map (TIM).

When implemented, it will enable access to geometry and attribute information about Idaho Bridges. It will increase interoperability between automated geographic information systems, and enable sharing and efficient transfer of information for aggregation. Further, it will encourage partnerships between government, the private sector, and the public to avoid duplication of effort, and ensure effective management of information resources. It will help improve Bridge data quality as errors are identified and resolved.

This standard does not consider data sharing agreements, contracts, transactions, privacy concerns, or any other issues relating to the acquisition and dissemination of Bridge data.

1.5. **Standard Development Process**

The Transportation TWG, is a voluntary group of private, city, county, tribal, state, and federal representatives. In 2022 the Chair of the Transportation TWG began developing the standard for the Bridge Framework using the standard development automation tools developed by the IGC-EC to generate the first draft of the Standard. This standard was then reviewed and edited by the members of the Transportation Technical Working Group.

After initial development the draft standard document was shared with the Idaho Geospatial Council Executive Committee (IGC-EC) and the Idaho Geospatial Council (IGC) in accordance with the review and approval process described in ITA Policy P5030 Framework Standards Development.

1.6. **Maintenance of the Standard**

This standard will be revised on an annual basis and in accordance with ITA Policy P5030 - Framework Standards Development.

2. **Body of the Standard**

2.1. **Scope and Content**

The scope of the Bridge Data Standard is to describe a statewide layer which identifies the physical locations and attributes of Bridges in Idaho. This layer includes all bridges in Idaho, including on and off the state highway system.

2.2. **Need**

Bridges are a key dataset needed for community and economic development needs, infrastructure maintenance, research and analysis, homeland security, business development, public safety, and more. This standard provides the foundation to aggregate Bridge data for centralized access and stewardship information.

2.3. **Participation in the Standard Development**

The development of the Bridge Data Standard adheres to the ITA Policy P5030 - Framework Standards Development. The Transportation Technical Working Group tasked with development, invite input and comments from private, county, state, and federal organizations. As the standard is reviewed in accordance with Policy P5030 requirements, there will be opportunity for broad participation and input by stakeholders. The process will be equally broad for input on updates and enhancements to the standard. As with all Idaho Framework standards, public review and comment on the Bridge Data Standard is encouraged.

2.4. **Integration with Other Standards**

The Bridge Data Standard follows the same format as other Idaho geospatial framework data standards. The Bridge standard may contain some of the same attributes as other framework standards and may adopt the field name, definition, and domain from the other standards to promote consistency.

The Bridge Key is the primary key. The Bridge Key in the Idaho Transportation Department dataset is only a 5-digit number and is similar to the National Bridge Inventory (NBI) primary key referred to as the NBI Bridge Key in that the NBI Bridge Key is the Bridge Key for Idaho with ten leading zeros. Most of ITD business systems utilize the 5-digit bridge key to integrate systems.

2.5. **Technical and Operation Context**

2.5.1. **Data Environment**

The data environment is a digital vector point with a specific, standardized set of attributes pertinent to the Bridge Framework. Bridge data shared under this standard must be in a format supporting vector point.

2.5.2. **Reference Systems**

The Bridge Framework will be published in the Idaho Transverse Mercator (IDTM) NAD83 coordinate system, which is the State of Idaho's single-zone coordinate system. Data is not required to be submitted in the ITDM coordinate system but must have a defined coordinate system clearly described in the metadata.

2.5.3. **Global Positioning Systems (GPS)**

Some data provided might contain geometry from GPS methods, and the provided metadata should describe this, if applicable. However, geometry from a GPS is not required to meet this standard.

2.5.4. **Interdependence of Themes**

Bridge geometry may be coincident with other framework data, such as parcels, runways. Currently there is no enforcement of coincidence or topology relationships between Bridge Framework and other Idaho Framework elements. There may be relationships with other framework elements as standards are created. Bridge geometry shares similar attributes with the Idaho Transportation Department LRS datasets and network which will play an important role in new data standard submission.

2.5.5. **Encoding**

When data is imported into and exported from the Bridge Framework, encoding will take place to convert data formats and attributes.

2.5.6. **Resolution**

No specific requirements for resolution are specified in this standard. Resolution will be documented in the metadata.

2.5.7. **Accuracy**

Each feature class in this standard specifies a required accuracy level. The accuracies indicated represent maximum horizontal distance the feature should be from the actual physical location of the object it represents in the real world, or absolute horizontal positional accuracy. Accuracies are indicated at the 95% confidence level, meaning that statistically 95% of the features within the feature class shall be at or better than the accuracy indicated. The FGDC Data Accuracy Standards describe how to confirm and the report that features meet this accuracy level.

2.5.8. **Edge Matching**

No edge matching is required between jurisdictions, or between this and other framework layers.

2.5.9. **Unique Identifier**

The BRKEY (Bridge Key) is the unique identifier utilized in Idaho for bridges, it relates to the NBI but is shortened to the last 5 digits.

2.5.10. **Attributes**

Attributes for public and intergovernmental distribution are described in Section 3 of this standard.

2.5.11. **Stewardship**

Perpetual maintenance and other aspects of lifecycle management are essential to the Bridge Framework. Details of stewards, their roles and responsibilities, and processes may be set forth in a Bridge Framework Stewardship Plan and related documents.

2.5.12. **Records Management and Archiving**

Internal web service maintenance at the Idaho Department of Transportation

2.5.13. **Metadata**

The Bridge Framework metadata will describe the methods used to update and aggregate the individual Bridge data contributions, processes or crosswalks performed, definition of attributes, and other required information. This metadata will conform to the metadata standards as set out in ITA Standard S4220 Geospatial Metadata.

3. **Data Characteristics**

3.1. **Minimum Graphic Data Elements**

The geometry of the features in Bridge Framework is vector point.

3.2. **Optional Graphic Data Elements**

Not applicable.

3.3. **Standard Attribute Schema**

Field Name	Alias	Data Type	Length
BRKEY	Bridge Key	Text	30
StructureName	Structure Name	Text	24
Features	Features	Text	24
Location	Location	Text	25
RouteID	Route ID	Text	12
Measure	Measure	Double	

RouteTravelway	Route Travelway	Text	1
RouteSystemCode	Route System Code	Text	2
RouteSystemNumber	Route System Number	Long	
CommonRoadName	Common Road Name	Text	120
AdminJurisdiction	Admin Jurisdiction (Ownership)	Text	24
BridgeOwnership	Bridge Ownership	Text	6
CountyName	County Name	Text	24
CountyFIPS	County FIPS	Text	3
CityName	City Name	Text	24
CityFIPS	City FIPS	Text	3
Latitude_DMDS	Latitude (WGS84-DMDS)	Double	
Longitude_DMDS	Longitude (WGS84-DMDS)	Double	
Latitude_DD	Latitude (WGS84-DD)	Double	
Longitude_DD	Longitude (WGS84-DD)	Double	
BorderBridge	Border Bridge	Text	24
BorderBridgeID	Border Bridge ID	Text	15
DrawingNumber	Drawing Number	Text	6
MainMaterialType	Main Material Type	Text	24
MainDesignType	Main Design Type	Text	24
ApproachSpanMaterial	Approach Span Material Type	Text	24
ApproachSpanDesignType	Approach Span Design Type	Text	24
Spans	Number of Spans	Long	
ApproachSpans	Number of Approach Spans	Long	
YearBuilt	Year Built	Long	
YearReconstructed	Year Reconstructed	Long	
NBI_Bridge	NBI Bridge (Y/N)	Text	1

3.4. **Data Quality**

Data quality considerations for Bridges include:

a. All Bridges should have Bridge Key.
b. All data must be edited and collected utilizing Idaho Transportation Departments BRM database or Esri Roads and Highways Environments

Appendix A: References

Idaho Technology Authority (ITA). *Information and Data Policy P5000, Category: P5030*

Framework Standards Development Policy. https://ita.idaho.gov/psg/p5030.pdf

Idaho Technology Authority (ITA). Enterprise Standards S4000 Geographic Information *Systems (GIS) Data, Category: S4220 Geospatial Metadata.* https://ita.idaho.gov/psg/s4220.pdf

Federal Geographic Data Committee (FGDC). *FGDC Data Accuracy Standards.* https://www.fgdc.gov/standards/projects/accuracy

Idaho Department of Transportation. *All Road Centerlines in the ITS linear referencing system (LRS)*. https://data-iplan.opendata.arcgis.com/datasets/IPLAN::all-idaho-road/about

Federal Highway Administration. *National Bridge Inventory – Based on the SNBI.* https://www.fhwa.dot.gov/bridge/nbi.cfm

Appendix B: Glossary

See ITA Guideline G105 (ITA Glossary of Terms) for definitions.