Discussion Panel
Topic: Authoritative Data
29 October 2019

FGDC/DOI
Joel Schlagel - Moderator
Questions for Panel

• What does authoritative data mean in context of federal geospatial data?

• Why is authoritative data important?

• What is your/ federal role in authoritative data?

• Is this problem solved... or are there areas for improvement?

• What do you see as steps that could be taken to improve access to authoritative data?
Lorna Schmid/FGDC & Jim Irvine/Ardent
Authoritative Data: Search, Metadata, Data.gov and GeoPlatform

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Authoritative Data Sources?

- Authoritative Data Defined
- Commercial Site Search
- Data.gov Search
- GeoPlatform.gov Search
Authoritative Data

Authoritative Data Source – An information technology (IT) term used by system designers to identify a system process that assures the veracity of data sources. ...

Authoritative Source – An entity that is authorized by a legal authority to develop or manage data for a specific business purpose.

Authoritative Data Source - A data source whose products have undergone producer data verification, validation and certification activities.

Authoritative Data Source - Predictive Services: https://www.predictiveservices.nifc.gov › intelligence › 08_ads_demystified


DoD 8320.2: Authoritative Source: A source of data or information that is recognized by members of a Community of Interest (COI) to be valid or trusted because it is considered to be highly reliable or accurate or is from an official publication or reference

DoD 8320.2: Authoritative Source: Data Provisioning Using Authoritative Data Sources: https://apps.dtic.mil › dtic › fulltext
The search for Authoritative Bridge Data

The Commercial Search Site Approach

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The Search for Bridge Data - Google

Bridges

Map of US Bridges

National Bridge Inventory - Federal Highway Administration
https://www.fhwa.dot.gov/bridge/nbi

Download NBI ASCII Files - National Bridge Inventory - Bridge ...
http://www.fhwa.dot.gov/bridge/nbi_ascii

BridgeReports.com: National Bridge Inventory data
https://bridgereports.com

Over 54,000 American Bridges Structurally Deficient, Analysis ...
https://www.americanroad.org/2018 Press Releases
Jan 29, 2018 - Home/2018 Press Releases, Press Releases Over 54,000 American Bridges Structurally Deficient, Analysis of Nine Federal Data Show Views...

Analysis of Federal Bridge Data Confirms ASCE Report Card...
The Search for Bridge Data - FHWA

Bridge Data

National Bridge Inventory (NBI)
- NBI Regulations, Memos, and Documents
- LRBP InfoBridge Web Portal (NBI data querying, analysis, and via
  - Download NBI Data
    - tables of all states and their data information
    - Recording and Coding Guide for the Structure Inventory and App
      - Errata Sheets for Coding Guide
      - Record Format
    - NBI Submittal File Check
      - NBI Data Check
    - FIPS/ANSI Codes
  - Download NBI Element Data
  - Specification for the National Bridge Inventory Bridge Elements
  - NBI Element File Check
    - NBI Element Check (pdf, 0.1 mb)
    - XML Schema
    - Example XML (4 mb)

Download NBI ASCII files
The following datasets represent bridge data sub
Structure Inventory and Appraisal of the Nation's
Changes to STRUCTURALLY DEFICIENT (SD):
Changes to FUNCTIONALLY OBSOLETE (CO):
- 2013 Data updated 4/22/19
- 2017 Data
- 2016 Data
- 2015 Data
- 2014 Data
  - 2014 Amendments (pdf, 0.1 mb)
- 2013 Data
- 2012 Data
- 2011 Data
- 2010 Data
- 2009 Data
- 2008 Data
- 2007 Data
- 2006 Data
- 2005 Data
- 2004 Data
- 2003 Data
- 2002 Data
- 2001 Data
- 2000 Data
- 1999 Data
- 1998 Data
- 1997 Data
- 1996 Data
- 1995 Data
- 1994 Data
- 1993 Data
- 1992 Data

LAT and LONG
Authoritative data (as of 4/22/19 and a map from Lat/long

https://www.fhwa.dot.gov/bridge/nbi/disclaim.cfm?nbiYear=2018/delimited&nbiState=CO18
https://www.fhwa.dot.gov/bridge/nbi/ascii.cfm
https://www.fhwa.dot.gov/bridge/nbi.cfm

https://www.fhwa.dot.gov/bridge/nbi/disclaim.cfm?nbiYear=2018/delimited&nbiState=CO18
https://www.fhwa.dot.gov/bridge/nbi/ascii.cfm
https://www.fhwa.dot.gov/bridge/nbi.cfm
InfoBridge API - The Most Current Bridge Data

The most current up to date authoritative data and map available

https://infobridge.fhwa.dot.gov/Data/Map
A Pause for the Law
OMB Circular A-16
And Geospatial Data Act

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NGDA Datasets

• Used by multiple agencies or with agency partners such as State, Tribal and local governments;
• Applied to achieve Presidential priorities as expressed by OMB;
• Required to meet shared mission goals of multiple Federal agencies; or
• Expressly required by statutory mandate
Subtitle F—Geospatial Data

SEC. 757. GEOSPATIAL DATA STANDARDS

(2) to the maximum extent practicable, shall be consistent with international standards and protocols

SEC. 758. GEOPLATFORM

(a) IN GENERAL.—The Committee shall operate an electronic service to be known as the GeoPlatform

GeoPlatform needs Data and Metadata

(b) IMPLEMENTATION (1)... The GeoPlatform (A) shall --

(iii) include metadata for all geospatial data collected by covered agencies, directly or indirectly;

(iv) include download access to all open geospatial data directly or indirectly collected by covered agencies;
Subtitle F—Geospatial Data
SEC. 759. COVERED AGENCY RESPONSIBILITIES
(3) SPECIFIC RESPONSIBILITIES.— lead covered agencies shall—

(E) as part of administering the National Geospatial Data Asset data theme— NGDA

(i) a performance report, at least annually, activities relating to and implementation of the National Geospatial Data Asset data theme

(iii) publish maps or comparable graphics online

(iv) encourage individuals to provide access to such data through the GeoPlatform Needs Data and Metadata

(v) coordinate with the GeoPlatform GeoPlatform needs Data and Metadata

(vi) identify and publish proven practices How I got my data on GeoPlatform!
The search for Authoritative Bridge Data

The Federal Search Site Approach

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Joel Schlagel - Moderator
Data.gov Bridge Search

Data.gov Federal Bridge Data

Metadata =
2 - Broken links
1 - Page to a manual redirect
No Data download
No web service
No Authoritative Data Source
Authoritative Data: BTS API

Authoritative Data Source
Authoritative Data: Data.gov and GeoPlatform

- **Data requires robust metadata** that captures all the facets that allow end-user to access source data
  - Direct data download
  - Web services (map, layer, feature, tile, etc.
  - APIs

- Community of Interest Value Added data
  - Starts with Authoritative Source Data
  - Clearly identifies fitness for use
Authoritative Data for HIFLD:

- HIFLD requires nationwide data, prefers authoritative data from accountable sources
  - Can obtain through secondary means

- Authoritative data provides user confidence, assumed provider ownership and maintenance, acquisition justification

- HIFLD does not decide what is authoritative
  - Default to FGDC (NGDA, etc.)
  - Some providers do not mark data as authoritative (confidence levels, crowd sourcing, etc.)

- Collaboration to determine which version of data is authoritative would improve clarity for user community
  - Or authoritative by purpose (collection intention, user requirements)
Define “Authoritative” rigorously, based on consensus
- Recognized or official data source with a mission statement
- Charged by organization to publish reliable and accurate data
- Example: Census Bureau widely recognized as authoritative source of urban and rural area boundaries
- Example: What is the most authoritative source of tribal land boundaries?

What is the value of authoritative data?
- Establishes a baseline of data, of quality, and of standard(s)
- Fosters trust in, and validity of data as well as any derived decision products, analytics

Authoritative data sets (or systems) need curation and governance

Collections of authoritative data can themselves be an authoritative source
- Collections require curation and active management – its more than just a database
- Example: DoD requires a collection of geospatial ADS for each installation
Data Provenance
- “Where does my data come from?”
- "What happened to it along the way?"
- “How can I be assured this is the latest/best available?”

Semantics
- “How can I unambiguously determine the meaning and significance of the data?”
- "How can I understand and exploit it?"
- “Can it be used by a science professional and an emergency management professional?”, “Both, one, or the other?”

Data quality (correctness, completeness, accuracy, precision, currency)
- “Can I use this for measurement?”
- "What is the error budget/ confidence interval?"
- “How current is this?”, “Good enough for planning purposes?”, “Good enough for engineering purposes?”

Technical integration and metadata (open, available, reliable, secure)
- “Is it openly available?”
- "Is it service-enabled?"
- "Can I reliably/confidently access the data?"
- "Are the data, service, and metadata in sync?"

Policies and data governance
- “What is the data management process?”
- “Who can change the data? In which situations?”
- “How are changes controlled? Managed? Reported?”
- “Who can use the data? In which situations?”
- “How are derivative products/value-add enhancements to be managed?”
- “How is feedback to upstream producers provided?”
- “How are changes documented?”
- “What is the frequency of change?”

Data modeling (level of abstraction/ fit-for-use)
- “Is it conceptual, logical or physical?”, “Quantitative, Qualitative, Objective, Subjective?”, “Thematic or reference?”
Trust Framework

A framework for assuring “trusted data” (i.e., “evidence”) must integrate the following elements:

1. Open Data (5-star open data, https://5stardata.info/) → machine-understandable!
2. Available, secured, assured
3. Known provenance (where it comes from, how good it is, and methods used to produce it are documented; consumers are assured of the accuracy and reliability of the sources and methods)
4. Produced/published according to established, open governance processes, methods and practices
5. Means for an “approving authority” to manage (control, approve and track) lifecycle changes according to established governance policies, practices, and workflows
6. Standards-based means for software and users to reliably determine the lifecycle status and provenance of any Open Data asset
7. Standards-based means to determine the Quality of Service (QoS) measures (e.g., availability, reliability, responsiveness) for any Open Data asset
How to implement in software?

- Objectives
  - Cross-domain standard for scoring most reliable data sources
  - Simple, easy-to-understand, and *machine-ready* way to indicate trust
  - Promote trusted data over others for more relevant search and improved decision-making

- Standards
  - Data Operational Readiness Level (ORL)
    - SISE WG (siseusa.org) with All Hazards Consortium (AHC), ESIP, NASA, NOAA
    - Rubric: Trusted & verified source, secure access, interoperability, availability, change notification, verified/tested, metadata completeness
  - Lifecycle state? Trust Markings? Scorecards? Branding?

- Governance
  - Trusted community of approved, vetted “approving authority” users
  - Central access and controls
  - Multi-sector, multi-agency collaboration/coordination
  - Planning framework for current/future issues and sustainment

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**SISE ORL**

**Trust Markings (straw)**

//source //status//sector//subject//AOI//currency//access
For example:
//FED/DOT/FHWA//VERIFIED//TRANSPORTATION//BRIDGES
//NATIONAL//2016-01-01,//WEBSITE,,SERVICE

**Status Indicator (straw)**

Submitted
- Rejected
- Superseded
- Retired
- Expired
- Approved-Local
- Approved-Regional
- Approved-National