

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 Sources - Predictive Services:](#)

<https://www.predictiveservices.nifc.gov> › [intelligence](#) › [08_ads_demystified](#)

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

Health.mil: <https://health.mil/Reference-Center/Glossary-Terms/2017/08/23/Authoritative-Data-Source>

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

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

Google search results for "bridges". The search bar shows "bridges" and the results page displays "About 2,660,000,000 results (0.65 seconds)". The top results include "Bridges | The Math Learning Center" and "Bridges - User account | Bridges Educator Site". Below the text results, there is a section for "Images for bridges" showing various bridge photos. A "People also ask" section contains questions like "What is the coolest bridge in the world?". At the bottom, a map shows the location of "Bridges Golf & Country Club" in Montrose, CO.

Map of US Bridges

Google search results for "map of us bridges". The search bar shows "map of us bridges" and the results page displays "About 197,000,000 results (1.07 seconds)". The top results are sponsored items for maps, such as "Map of the United States..." and "Sultan Kids USA Map Blue Area...". Below the sponsored items, there is a section for "Images for map of us bridges" showing various maps of the United States. A "People also ask" section contains questions like "How many bridges need repair in the US?". At the bottom, there is a link to "US infrastructure structurally deficient bridges map - Business Insider" with a date of Mar 31, 2016.

Google search results for "federal bridge data". The search bar shows "federal bridge data" and the results page displays "About 157,000,000 results (0.68 seconds)". The top result is "National Bridge Inventory - Federal Highway Administration" with a URL "https://www.fhwa.dot.gov/bridge/nbi". Below this, there is a "People also search for" section with terms like "national bridge inventory gis" and "fhwa element level bridge inspection". Another result is "Download NBI ASCII files - National Bridge Inventory - Bridge ..." with a URL "https://www.fhwa.dot.gov/bridge/nbi/ascii". A "People also ask" section contains questions like "What is a functionally obsolete bridge?". At the bottom, there is a link to "Over 54,000 American Bridges Structurally Deficient, Analysis ..." with a URL "https://www.artba.org/2018/PressReleases/Jan29_2018-Home/2018PressReleases_PressReleases/Over54000AmericanBridgesStructurallyDeficientAnalysisofNewFederalDataShows...".

The Search for Bridge Data - FHWA

Bridge Data

U.S. Department of Transportation
Federal Highway Administration

Bridges & Structures

Structures Geotech Hydraulics **Safety and Management**

Bridge Inspection Tunnel Inspection Bridge Pre-

Load Rating NBIS **NBI**

Home / Programs / Bridges & Structures / Safety / Bridge Inspection / National Bridge Inventory

National Bridge Inventory (NBI)

- NBI Regulations, Memos, and Documents
- LTBP InfoBridge Web Portal (NBI data querying, analysis, and visualization)
- Download NBI Data**
- Tables of Frequently Requested NBI Information
- Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges
 - Errata Sheets for Coding Guide
 - Record Format
- NBI Submittal File Check
 - NBI Data Checks
- FIPS/ANSI Codes
- Download NBI Element Data
- Specification for the National Bridge Inventory Bridge Elements
- NBI Element File Check
 - NBI Element Checks (.pdf, 0.1 mb)
 - XML Schema
 - Example XML (4 mb)

<https://www.fhwa.dot.gov/bridge/nbi.cfm>

<https://www.fhwa.dot.gov/bridge/nbi/ascii.cfm>

<https://www.fhwa.dot.gov/bridge/nbi/ascii2018.cfm>

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

<https://www.fhwa.dot.gov/bridge/nbi/2018/delimited/CO18.txt>

Download NBI ASCII files

The following datasets represent bridge data sub-Structure Inventory and Appraisal of the Nation's Bridges by calendar year.

[Changes to STRUCTURALLY DEFICIENT \(SD\):](#)

[Changes to FUNCTIONALLY OBSOLETE \(FO\):](#)

- Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges
- Errata Sheets for Coding Guide
- Record Format

2018 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

Delimited files

Files are comma separated and the single quote is the text qualifier.

- Download Highway Bridges for all States (individual state files) as a zip file (58 mb)
- Download Highway Bridges for all States (in a single file) as a zip file zip file (58 mb)
- Download all records. Includes non-highway and routes under bridges zip file (62 mb)

State	No. Highway Bridges
Alabama	16,130
Alaska	1,592
Arizona	6,294
Arkansas	13,662
California	25,737
Colorado	8,786
Connecticut	4,270

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

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	STATE_CO	STRUCTUF	RECORD_I	ROUTE_PF	SERVICE_L	ROUTE_NI	DIRECTIO	HIGHWAY	COUNTY_	PLACE_CO	FEATURES	CRITICAL	FACILITY_	LOCATION	MIN_VERT	KILOPOIN	BASE_HW	LRS_INV_	FSUBROU	LAT_016	LONG_017
2	8	0400-	1	6	8	50	0	0	85	0	'Cimarron creek		'Access Mc'	'Cimarron	99.99	0	0			38263100	1.07E+08
3	8	0400-	1	6	8	0	0	0	85	0	'Cimmeron Creek		'Access Mc'	'Cimmeron	99.99	0	0			38264900	1.07E+08
4	8	0400-	1	6	8	0	0	0	85	51385	'Cimmeron Creek		'Access Mc'	'Cimmer	99.99	0	0			38275000	1.07E+08

InfoBridge API- The Most Current Bridge Data

The most current up to date authoritative data and map available

The screenshot displays the InfoBridge Data interface. On the left, the 'Find Bridges' panel shows search criteria for NBI (National Bridge Inventory) and NBE (National Bridge Element Data). The 'Bridge Selection and Mapping' panel shows 8,374 of 616,096 bridges selected. A map of Colorado is shown with a white overlay, and a data table is displayed below it.

Criteria	Count
State Name (1)	8-Colorado
Structure Number (8)	PUCO 0.01-301BR
Owner (22)	2-County Highway Agency
Kind of Material/Design (44A)	5-Prestressed concrete
Type of Design/Construction (44R)	1-Slab

<https://infobridge.fhwa.dot.gov/Data/Map>

A Pause for the Law

OMB Circular A-16 And Geospatial Data Act



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OMB A-16 NGDA as Authoritative Data

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

Authoritative Data: GDA, Metadata, and GeoPlatform

Subtitle F—Geospatial Data

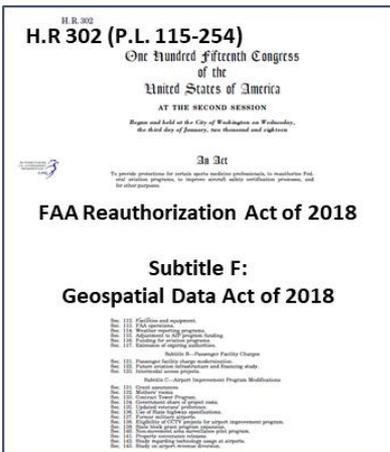
SEC. 757. GEOSPATIAL DATA STANDARDS

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

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;



Authoritative Data: GDA, Metadata, and GeoPlatform

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

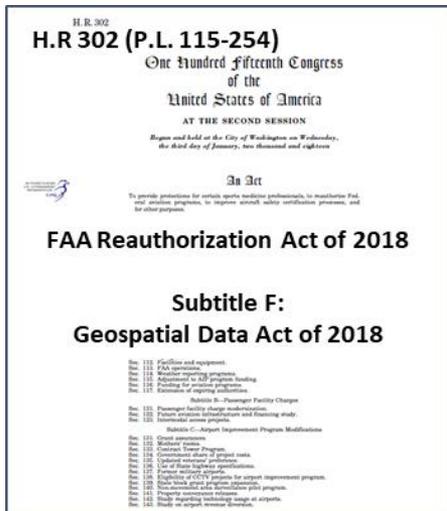
(I) a performance report, at least annually, activities relating to and implementation of the National Geospatial Data Asset data theme

(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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Data.gov Bridge Search

Data.gov Federal Bridge Data

The screenshot shows the Data.gov search interface. The search bar contains 'Federal Bridge Data'. Below the search bar, it indicates '26,578 datasets found for "Federal Bridge Data"'. A list of results is shown, including 'Bridges', 'Railroad Bridges', and 'National Bridge Inventory (NBI) Bridges'. The 'National Bridge Inventory - National Geospatial Data Asset (NGDA) Bridges' result is highlighted with a red box. To the right of the search results, there are three red arrows pointing to the right, labeled 'City', 'Federal', and 'Federal'.

The screenshot shows the 'National Bridge Inventory - National Geospatial Data Asset (NGDA) Bridges' page. The page includes a description of the NBI (NTAD) dataset, 'Access & Use Information' (License: U.S. Government Work), and 'Downloads & Resources'. The 'Downloads & Resources' section lists three web pages with view counts and 'Visit page' buttons. The third web page, 'Web Page 1811 views', is highlighted with a red box.

The screenshot shows the Bureau of Transportation Statistics (BTS) website. The main navigation bar includes 'Topics and Geography', 'Statistical Products and Data', 'National Transportation Library', 'Newsroom', and 'About'. The main content area features a heading 'rita.dot.gov/bts is now www.bts.gov!' and a message explaining the website's move. A 'Questions?' section on the right provides contact information and business hours. The 'Share' button is also visible.

Metadata = 2 - Broken links
 1 - Page to a manual redirect
 No Data download
 No web service

No Authoritative Data Source



Authoritative Data: BTS API

Bureau of Transportation Statistics

Search BTS site

Topics and Geography | Statistical Products and Data | National Transportation Library | Newsroom | About BTS

TOPICS

- Airlines and Airports
- Energy and Environment
- Freight Transportation
- Infrastructure
- Passenger Travel
- Safety
- System Performance
- Transportation and the Economy

GEOGRAPHY

- Geospatial Portal
- Map Gallery
- International
- National
- By State

MODES

- Highway
- Rail
- Maritime and Inland Waterways
- Pipelines
- Transit
- Bicycles and Pedestrian

Geospatial Portal

Data | **Maps** | **Applications** | **Overview**

National Bridge Inventory

Last updated 3 months ago | 616,096 Records

OBJECTID	STATUS	DATE	LONGDD	LATDD	STATE_CODE_001	STRUCTURE_NUMBER_008
1	AM	1202	79.9017	39.2858	54	00000000001A001
2	AM	1202	79.90428889	39.28846944	54	00000000001A002
3	AM	1202	79.90809944	39.28928056	54	00000000001A003
4	AM	1202	79.86806111	39.19558889	54	00000000001A006
5	MM	0003	80.05381111	39.15048056	54	00000000001A007

Authoritative Data Source

Authoritative Data: GeoPlatform Search

The image shows a screenshot of the GeoPlatform.gov search interface. The search bar contains the text 'bridges'. The results page displays a list of datasets, with the first result being the 'National Bridge Inventory - National Geospatial Data Asset (NGDA) Bridges'. A red box highlights the search bar and the filter options on the left. A red arrow points from the search results to a detailed view of the 'National Bridge Inventory' dataset. This detailed view includes sections for 'OVERVIEW', 'Access the Resource', 'Purpose', 'Use Constraints', 'Additional Identifiers', 'Themes', 'Topics', and 'RELATED RESOURCES'. The 'OVERVIEW' section lists the publisher as the Federal Highway Administration (FHWA) and the Office of the Assistant Secretary for Research and Technology/Bureau of Transportation Statistics (DOT-BTS). The 'Purpose' is to document the nation's bridge inventory. The 'Use Constraints' state that the data can be freely distributed as long as the metadata entry is included. The 'RELATED RESOURCES' section lists 'Distributions'.

GeoPlatform.gov

Search the GeoPlatform

HOME > SEARCH

bridges

ADD FILTERS

For information about the following filter options and how they can be used to refine search results, please visit the Search Help Page.

Types

Communities

Creator

Date Range

Geographic Extent

Keywords

Publishers

Semantic Concepts

Themes

Topics

CURRENT FILTERS

Add filters using the options above

clear all

PORTFOLIO SITE CONTENT

244 results 10 per page

National Bridge Inventory - National Geospatial Data Asset (NGDA) Bridges

Dataset by GeoPlatform Curator B | created Mar 1, 2016

The NBI (NTAD) is a collection of information (database) describing the more than 610,000 of the Nation's bridges located on public roads, including Interstate Highways, U.S. highways, State and county roads, as well as publicly-accessible bridges on Federal lands. It presents a State by State summary analysis of the number, location, and general condition of highway bridges within each State. Please note: 11,168 records in this database were geocoded to latitude and longitude of 0.0 due to lack of location information or errors in the reported

Find similar items

Bridges

Layer by GeoPlatform Curator B | created Sep 3, 2016

Vector file of bridges compiled from https://www.fhwa.dot.gov/divisions/eng

Find similar items

[OBE] Bridges

Dataset by unknown | created Mar 1, 2016

Find similar items

GeoPlatform.gov

NATIONAL BRIDGE INVENTORY - NATIONAL GEOSPATIAL DATA ASSET (NGDA) BRIDGES

Alternate Titles (0)

Expand to see alternate titles for this resource

Description

The NBI (NTAD) is a collection of information (database) describing the more than 610,000 of the Nation's bridges located on public roads, including Interstate Highways, U.S. highways, State and county roads, as well as publicly-accessible bridges on Federal lands. It presents a State by State summary analysis of the number, location, and general condition of highway bridges within each State. Please note: 11,168 records in this database were geocoded to latitude and longitude of 0.0 due to lack of location information or errors in the reported

OVERVIEW

Publisher(s)

Federal Highway Administration (FHWA)

Office of the Assistant Secretary for Research and Technology/Bureau of Transportation Statistics (DOT-BTS)

Issued

Jan 1, 2016

Landing Page

Access the Resource

Not specified

Purpose

To document the nation's bridge inventory.

Use Constraints

Use Constraints: The NBI database, or any portion thereof, can be freely distributed as long as this metadata entry is included with each distribution. The original metadata entry cannot be modified or deleted from any data transfer.

Additional Identifiers (2)

Expand to see alternate identifiers for this resource

Themes (14)

Expand to see themes referenced by this resource

Topics (0)

Expand to see topics referenced by this resource

RELATED RESOURCES

Distributions (0)

Expand to see distributions for this dataset

Explore NGDA Themes

GEOGRAPHIC EXTENT

View all of this resource's details using

View in Object

View this resource on a map. For Service hosted by the service. For Dataset re layers as well as layers hosted by associ

Preview

Like this GeoPlatform resource

Download the source metadata for this

Download Sour

Export this resource to one of the follow

Export a

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

Thomas Springsteen/BAH: HIFLD Federal Data

Authoritative Data for HIFLD:

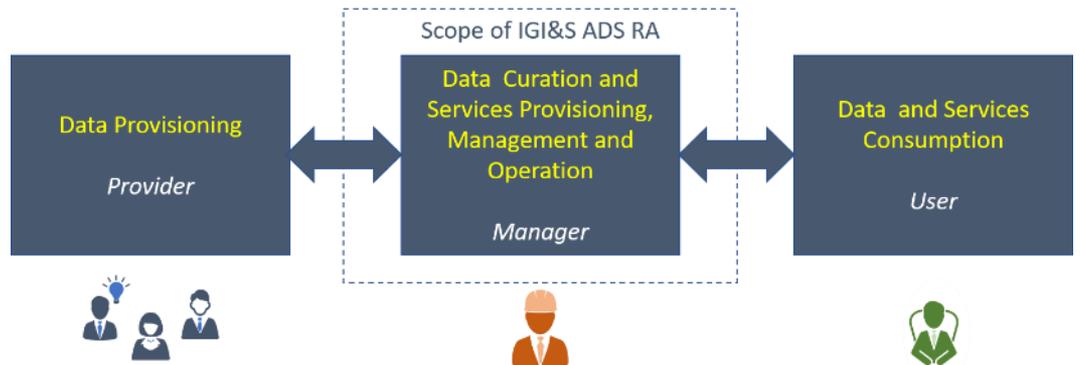
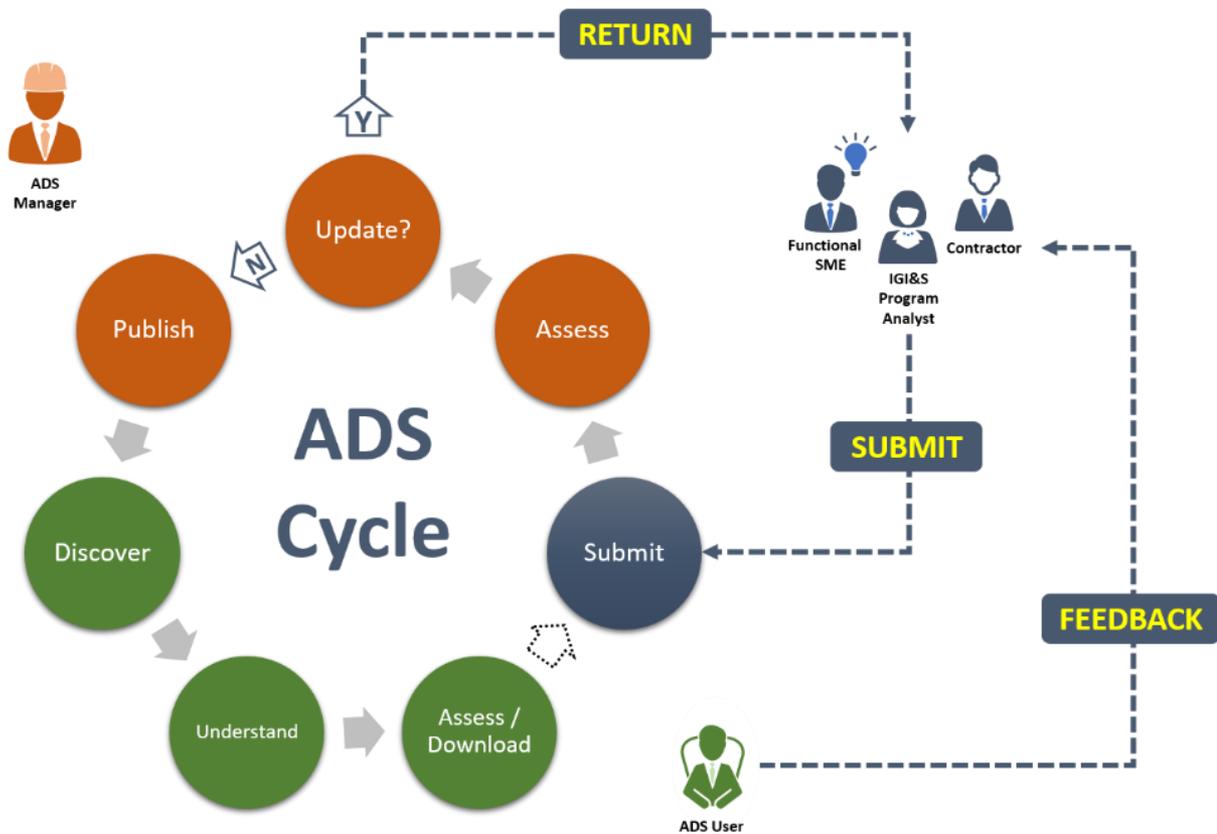
- HIFLD requires nationwide data, prefers authoritative data from accountable sources
 - Can obtain through secondary means
- Authoritative data provides user confidence, assumed provider ownership and maintenance, acquisition justification
- HIFLD does not decide what is authoritative
 - Default to 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)



David LaBranche/DOD : DoD Perspectives on ADS

ASSISTANT SECRETARY OF DEFENSE FOR SUSTAINMENT

- 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



John Davidson/GeoPlatform.gov: Circle of Trust

- **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

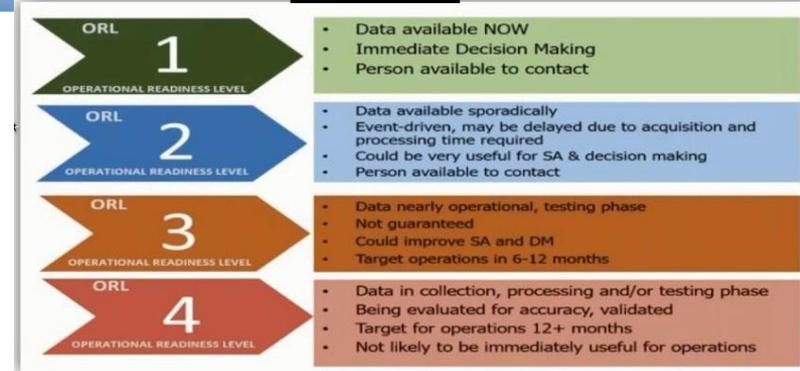
Standards

- 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

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)

