



Words Matter

Managing Vocabulary Resources to Support Productivity

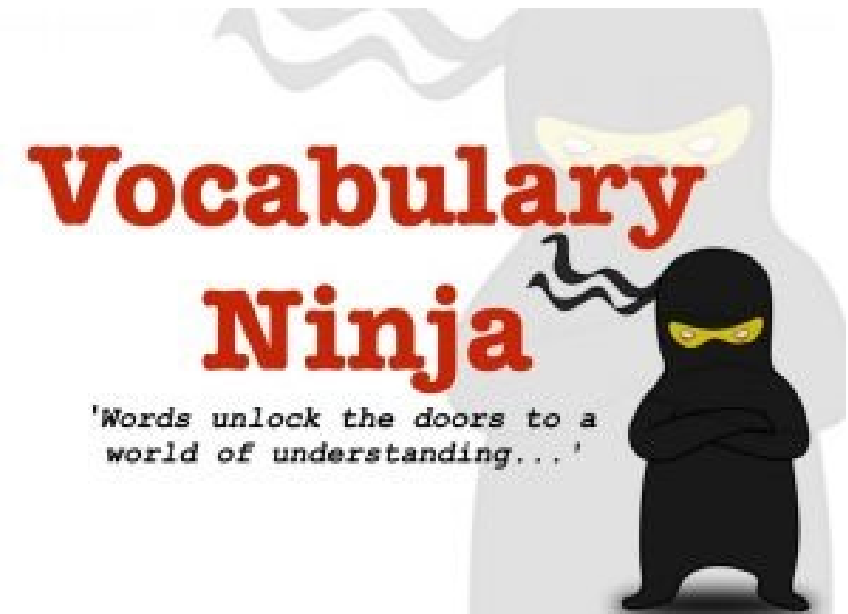
Transportation Librarians Roundtable
November 4, 2021

The WSDOT Vocabulary Team

The WSDOT Vocabulary Team is a Subcommittee of the WSDOT Data Governance Council (E-1095.01)

The **WSDOT Vocabulary Team** includes:

- **Leni Oman**, Knowledge Strategist – Team Coordinator
Knowledge Services
Transportation Safety & Systems Analysis Division
- **Andy Everett**, Data Curator/Taxonomist
Data Management Services
Information Technology Division
- **Kathy Szolomayer**, WSDOT Head Librarian
Research and Library Services
Transportation Safety & Systems Analysis Division
- **Christy Granquist**, Librarian
Vessel Engineering
Washington State Ferries Division



<https://vocabularyninja.wordpress.com/>



The Business Need

- **Current challenge**
- **Lost productivity**
- **Changing paradigm**
- **Common information needs**
- **Supporting our intention**
- **Improving findability & relevance**
- **The Findability Framework**



Current challenges

- Difficult to find or discover data and information resources
- Uncertainty about the data and information found
- Collaboration
- Interoperability
- Industry practices are inconsistently applied



Lost productivity

Employees spend between 15% and 50% of their time looking for the data and information they need



[Image Source](#)

Lack of sound data and information management costs WSDOT between \$108M to \$359M in productivity loss per year.

A Changing Paradigm



Old Paradigm



New Paradigm



Common information needs

Employees along the Practical Solutions lifecycle have many common information needs.

There is an opportunity for efficiency in management of data and information.

		Practical Solutions Lifecycle							
		Establish Policy Framework	Manage Assets	Identify Needs	Assess Alternative Strategies	Refine Solutions	Assign Resources	Develop Funded Solutions	Implement Solutions
Knowledge & Information Needs	System/Service/Asset Inventory	✓	✓	✓		✓		✓	✓
	System Condition & Performance	✓	✓	✓	✓	✓	✓	✓	✓
	Demand/Utilization/Travel	✓	✓	✓	✓	✓	✓	✓	✓
	Stakeholder Concerns & Priorities	✓	✓	✓	✓	✓	✓	✓	✓
	Fed & State Laws, Regulations & Policies	✓	✓	✓	✓	✓	✓	✓	✓
	Agency Standard Operating Procedures & Standards	✓	✓	✓	✓	✓	✓	✓	✓
	Local Policies & Plans	✓		✓		✓			
	State & Regional Transportation Plans	✓	✓	✓	✓	✓	✓		
	Strategy Costs & Effectiveness			✓	✓	✓		✓	✓
	Revenues, Budgets & Expenditures	✓	✓			✓	✓	✓	✓
	Resource Availability		✓				✓	✓	✓
	Solution Development History		✓		✓	✓	✓	✓	✓
	Commitments & Agreements		✓		✓	✓	✓	✓	✓
	Projects, Programs, Grants			✓	✓	✓	✓	✓	✓

Supporting agency goals

Word choice is a fundamental element in conveying intention.

Word Choices

Use in state law, administrative code, documents, and media communications	Instead of	Why?
crash or collision	accident	The recommended terms are consistent with usage recommended by the National Highway Traffic Safety Administration (NHTSA), public health practitioners, Associated Press, and others. Crashes and collisions are not accidents, they are preventable, and their severity can be reduced.
driver, motorist, or person driving	car or vehicle	Do not refer to the vehicle as taking actions on its own, e.g., "the car then turned right and proceeded down the road."
roadway user, people who walk, people who bike, pedestrian, or bicyclist	non-motorist	Particularly with the emergence of connected and autonomous vehicles, media coverage and official reports should be clear and specific in labeling the actions of the driver rather than the vehicle. Using the term roadway user purposefully avoids assuming that driving is the norm and all other modes of transportation are alternatives to driving. The Bicycle and Pedestrian Advisory Councils advocate for using people-first language, such as "people who walk" and "people who bicycle." Target Zero uses the terms "pedestrian" and "bicyclist" when these definitions have a specific meaning in the data definition.
bicycling, walking, or active transportation	non-motorized transportation or alternative transportation	Using the term non-motorized or alternative transportation reinforces a priority within the transportation system for the use of motorized vehicles. The preference should be to directly label or describe each mode of travel being used on roadways. The term active transportation is used to include walking, bicycling, using a mobility assist device like a wheelchair or walker, or using a small-wheeled device such as a skateboard, foot scooter/e-scooter, or inline skates.

Target Zero, Washington State Strategic Highway Safety Plan, 2019

Findability depends on context and user requirements

Context questions

- Who is the user? What is their role?
- What are the user's objectives?
- What information is needed?
- How do discovery behaviors vary among users?

Requirements questions

- What are you looking for?
- How did you look?

Portrait vs. Landscape

INDIVIDUAL



BIGGER PICTURE



Images from <https://nyheder.tv2.dk/samfund/2020-04-26-hvor-taet-er-folk-paa-hinanden-disse-billeder-er-taget-samtidig-men-viser-to>

“What you believe is happening depends on how you frame the image”



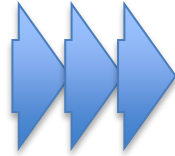
Findability Framework

People



- ✓ Identify users
- ✓ Define user types
- ✓ Understand user goals
- ✓ Design audience profiles
- ✓ Create personas

Process



- ✓ Analyze business process
- ✓ Identify activities
- ✓ Model tasks and workflow
- ✓ Document user scenarios
- ✓ Define use cases

Resources



- ✓ Identify and analyze resources
- ✓ Define resources and object types
- ✓ Create metadata schemas
- ✓ Develop organizing principles (taxonomy, thesauri, ontology)

Technology



- ✓ Envision the User Experience
- ✓ Develop the software architecture
- ✓ Select search engine
- ✓ Configure search engine
- ✓ Design autoclassification workflow

Governance



- ✓ Establish information governance committees and principles
- ✓ Socialize and promote user adoption
- ✓ Measure success (analytics, metrics, feedback)

Source, Ralph Poole, iKnow, LLC & Columbia University



Classification Tools

- **Metadata**
- **Glossaries**
- **Taxonomies**
- **Thesaurus**
- **Ontologies**



Metadata

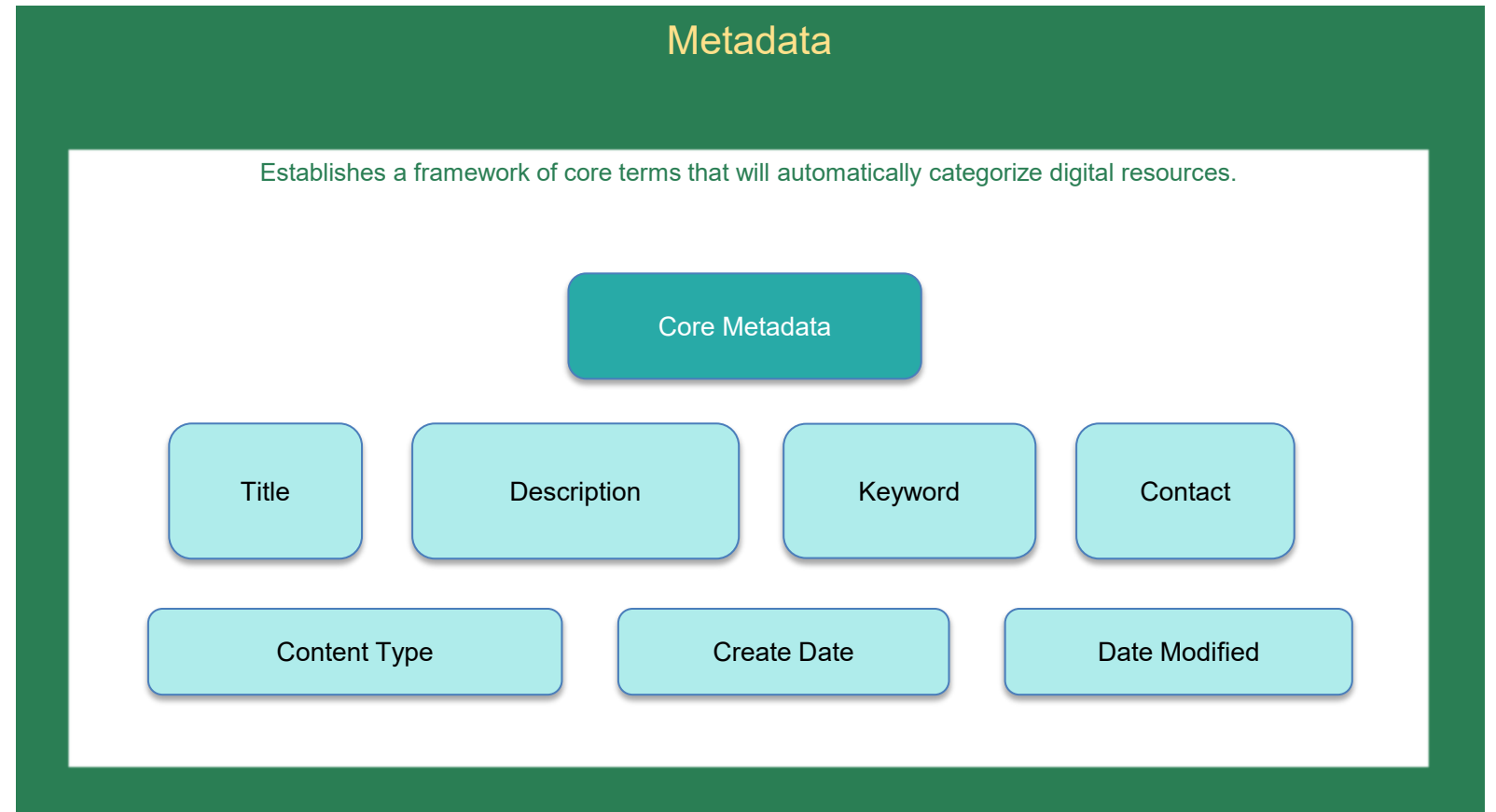
What is it?

- Describes information resources

Business Value

Improved:

- Findability
- Accessibility
- Interoperability
- Reusability



Glossaries

What is it?

- Organizes terms alphabetically or by topic and defines meaning.

Business Value

- Provides a resource of definitions, promotes common understanding of terms, and establishes a practice for integrating and disseminating new terms or term use and raising concerns with existing definitions.

Glossary

Organizes terms alphabetically or by topic and defines meaning.
Terms may have more than one meaning in different contexts.
Supports common understanding of a term.

Bicycle	Any device propelled solely by human power upon which a person or persons may ride, having two tandem wheels, either of which is 16 inches or more in diameter, or three wheels, any one of which is more than 20 inches in diameter.
Bus Stop	A place designated for transit vehicles to stop and load or unload passengers.
Highway	A general term denoting a street, road, or public way for the purpose of vehicular travel, including the entire area within the right of way.
Light Rail System	A passenger railway system characterized by its ability to operate single cars or short trains along rails on exclusive right of way.
Park and Ride Lot	Parking at a facility which serves as a transfer terminal for automobiles and bikes and which is normally served by public transportation.

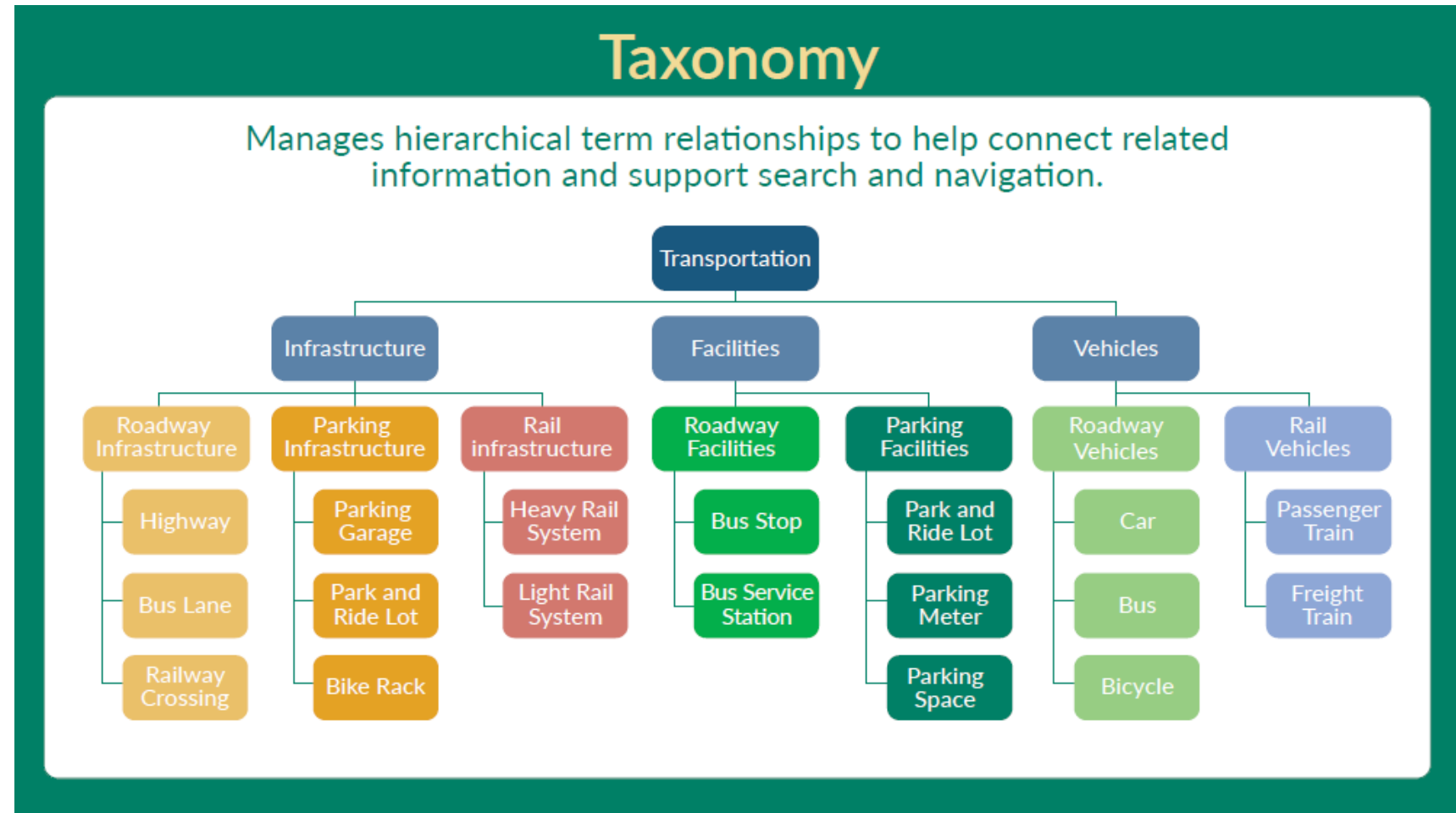
Taxonomies

What is it?

- Manages hierarchical term relationships to help connect related information and support search and navigation.

Business Value

- Improves search experience on WSDOT Web resources and navigation between agency digital data and information repositories.



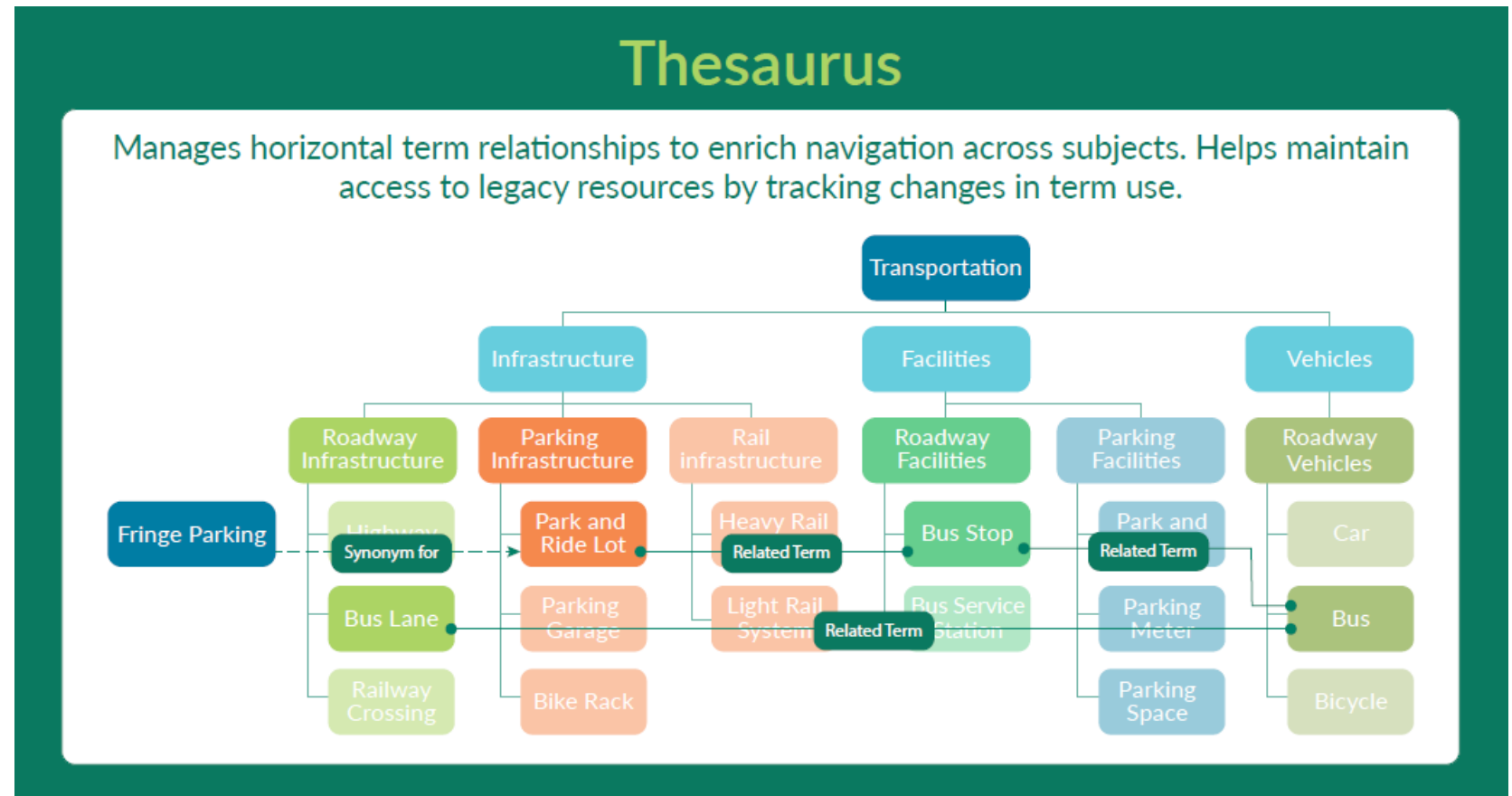
Thesaurus

What is it?

- Manages horizontal term relationships to enrich navigation across subjects.
- Helps maintain access to legacy resources by tracking changes in term use.

Business Value

- Improves
 - search experience across WSDOT Web resources
 - navigation between agency digital data and information repositories
 - helps clarify data and information use by a domain



Ontologies

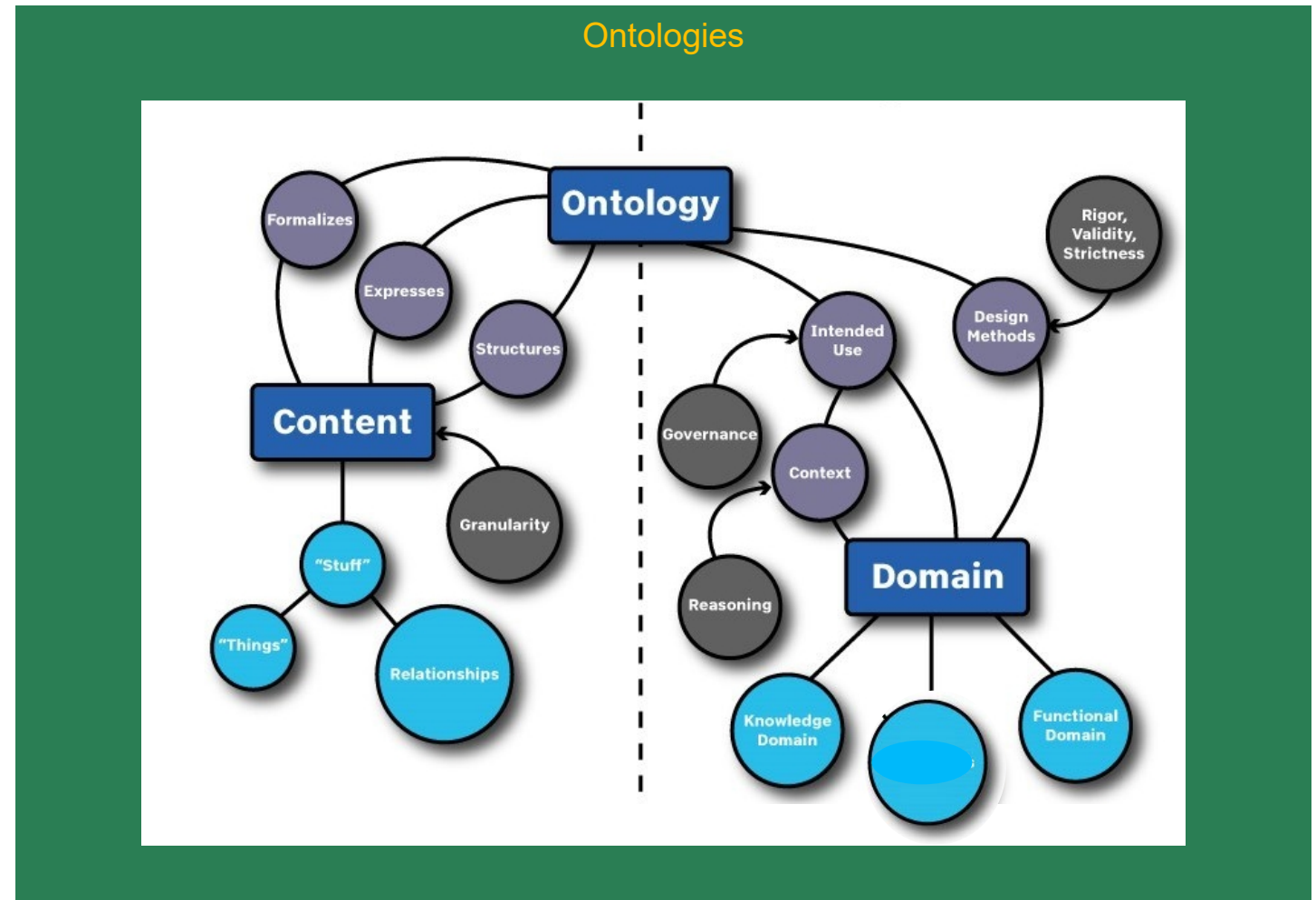
What is it?

- Ontologies contain logical relationships that make it possible to link and share data among applications, systems, and work processes

Ralph Poole, iKnow

Business Value

- Improved search
- Carries meaning and context
- Improved precision in search returns



Source: [The importance of controlled ontology \(riffyn.com\)](http://riffyn.com)



Vision for Vocabulary Management

- **Vision**
- **The business need**
- **Vision & Mission**
- **Increasing term value**
- **Vocabulary Governance**
- **Impact of Vocabulary Management**

Words Matter

- Building blocks for effective coordination and collaboration
 - human
 - digital
- Information science has proven classification tools
- Enable the findability, relevance, discoverability, and navigability of data and information



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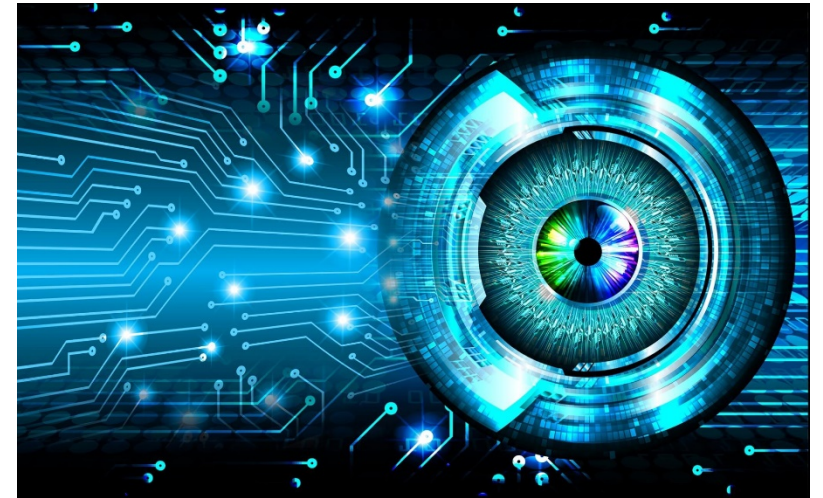
Vision & Mission

Vision

- Employees and stakeholders predictably find trusted information to support business decision-making and to foster common understanding, connections, and collaboration across professional disciplines and among users

Mission

- The Vocabulary Management team works with customers to use, develop, establish, and adapt controlled vocabularies to facilitate better information organization and retrieval. The team promotes the reuse of standardized and existing vocabularies.



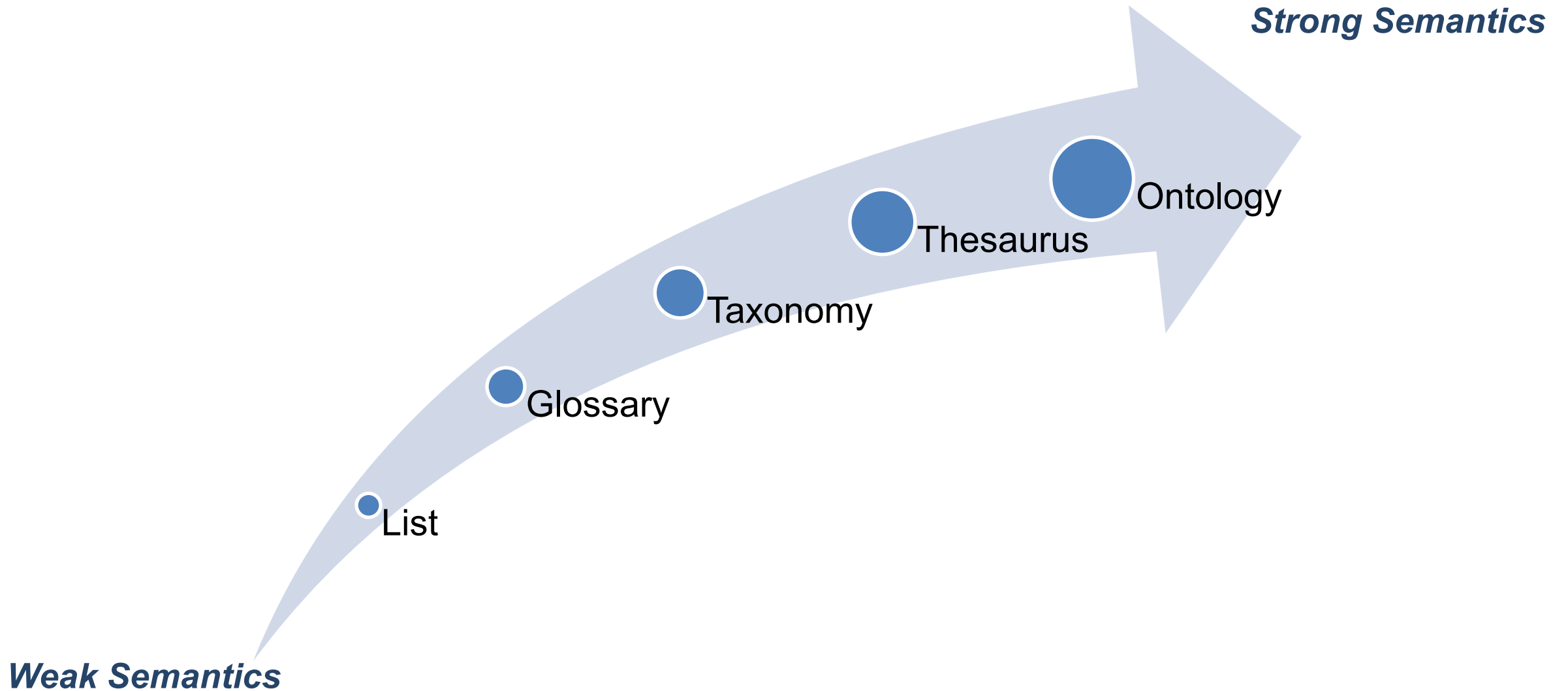
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[Vocabulary Management Charter](#)

[Vocabulary Management - outreach document](#)



Increasing Term Value & Meaning



Source: Leo Orbst, Mitre, 2011



Vocabulary Governance

GOAL

To promote consistency in how we manage and select essential business terms





Impact of Vocabulary Management

- Data are findable and discoverable
- Productivity and customer satisfaction increase
- Data and information are used within the intended scope.
- Data integration becomes more feasible



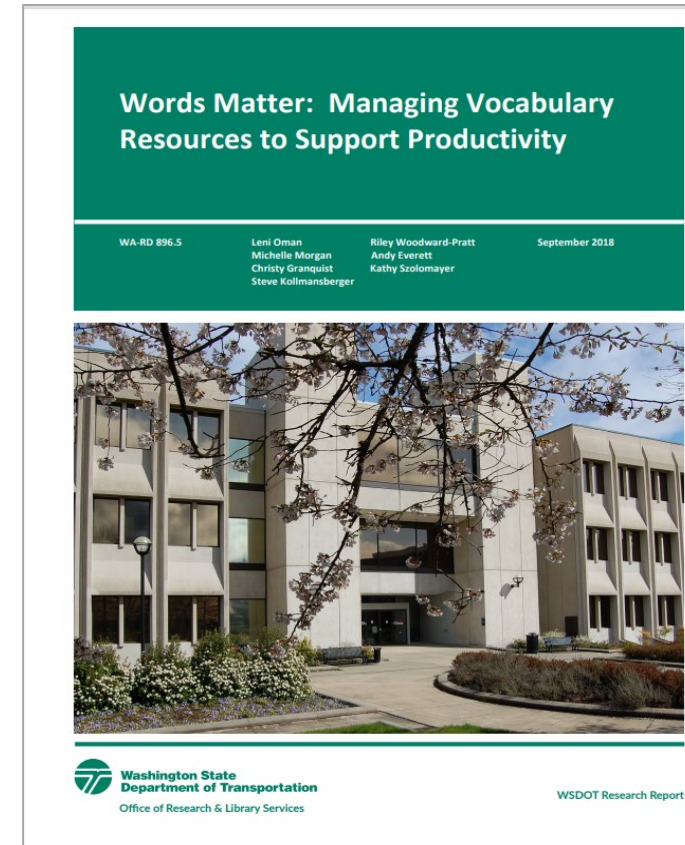


PILOTS & PRODUCTS

- **Words Matter**
- **WSDOT Glossary**
- **Core Metadata**
- **Manual Modernization**
- **Business Function Classification**
- **Business Domains**

Words Matter: Managing Vocabulary Resources to Support Productivity

- FHWA grant
- Partnership
 - Knowledge Management
 - WSDOT Libraries
 - Data Management Services
- Aligning classification tools to improve common understanding and search and navigation
- Governance concepts



[Words Matter: Managing Vocabulary Resources to Support Productivity \(wa.gov\)](https://www.wa.gov/words-matter)

WSDOT glossary

- Combines glossaries from [WSDOT Manuals](#)
- Comprehensive resource of agency definitions
 - To add clarity to agency communication
 - Document discipline-specific definitions for the same term
 - Provide a reliable process through which terms are vetted, by agency's Vocabulary Team
- Supported by the WSDOT Vocabulary Team
- Hosted by the WSDOT Library

Washington State Department of Transportation

Traffic & Cameras | Projects | Business | Environment | Maps & Data

Home » Glossary

Menu

- Glossary home
- Bridge Design
- Consultant Services
- Cost Estimating
- Design
- Design - ADA/Pedestrian
- Environmental
- Highway Runoff
- Right of Way
- Roadside
- Roadside Policy
- Standard Specifications
- Toll
- Utilities

Glossary

This glossary consolidates all the terms included on our published [WSDOT Manuals](#) website. Terms are listed alphabetically and identified by the manual (and occasionally manuals) they appear in. Where a term has entries in multiple manuals with differing definitions, the entries from each manual are distinguished using parentheses, e.g. 'right of way (Design)' vs 'right of way (Highway Runoff).

The Library and WSDOT Knowledge Services are interested in further development of this glossary, both to improve consistency and increase ease of access. If you have any questions, comments, or see any errors, please send them to Riley.Woodward-Pratt.

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

[abandoned facilities](#)

Source: Utilities

Those facilities located within WSDOT right of way, on an easement or other property right of the utility, that remain in the right of way after the utility has given the state a quitclaim deed to the property right. The utility is no longer responsible for the facility, and all costs for future impacts created by the facility are now borne by the state.

[abatement](#)

Source: Environmental

Reduction in degree or intensity.

[accelerated climax plant community](#)

Source: Roadside

The process of restoring a site to a desirable climax plant community in reduced time when compared to natural processes

[acceptance of assignment](#)

Source: Utilities

See also: [transfer of ownership](#)

[Glossary | WSDOT \(wa.gov\)](#)

Metadata Schema

Core Basic Metadata

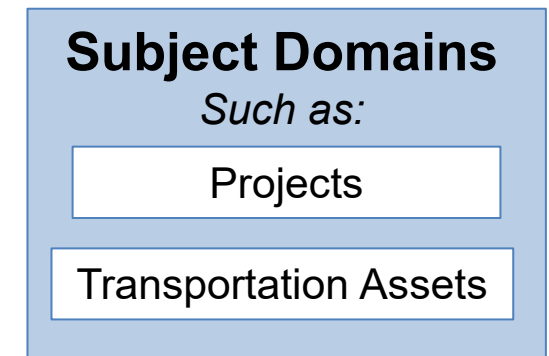
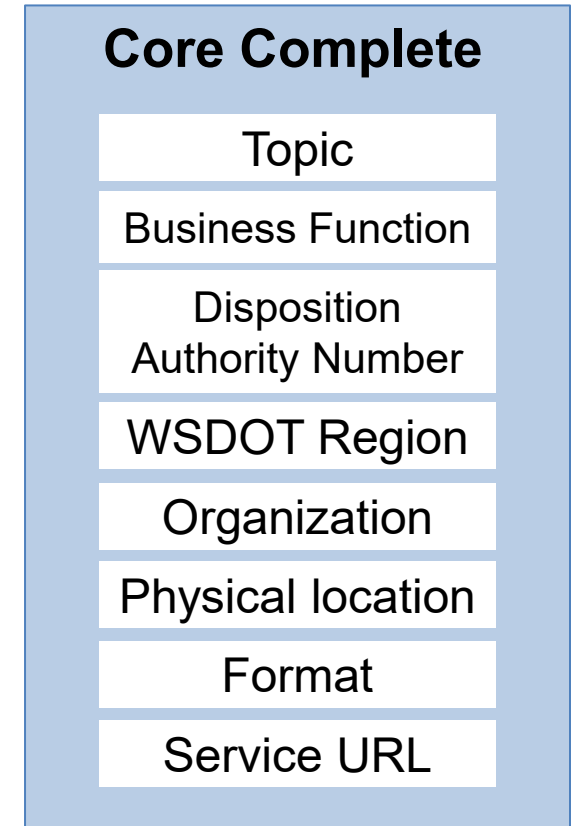
- Minimum required metadata
- Common attributes across all information resources
- Capture could be automated

Core Complete Metadata

- Complete set of metadata to describe all information resources at WSDOT
- Includes optional elements

Metadata Schemes are Extensible

- Add metadata to cover specific needs of subject domains and specialized data sets (i.e., Geospatial Data)





Manual Modernization Pilot

Improving the ability to search and navigate across agency manuals

Engineering Manuals Outline

- [Design Manual](#)
- [Environmental Manual](#)
- [Highway Runoff Manual](#)
- [Hydraulics Manual](#)
- [Roadside](#)
- [Roadside Policy Manual](#)
- [Temporary Erosion and Sediment Control Manual](#)
- [Utilities](#)

Filter by book:

- [Highway Runoff Manual \(44\)](#)
- [Temporary Erosion and Sediment Control Manual \(28\)](#)
- [Environmental Manual \(7\)](#)
- [Hydraulics Manual \(7\)](#)
- [Roadside \(3\)](#)
- [Utilities \(3\)](#)

Filter by assets

- [Drainage Asset \(17\)](#)

BMP / Search

Search

About 92 results

[Visualize these Results](#)

5-4 BMP Design Criteria Highway Runoff Manual

Note: Follow the **BMP** selection process in Section 5-3 before selecting a **BMP**. The stormwater management methods in this section have been categorized in order of preferred use and grouped according to similar composition and function. Each **BMP** has an associated number to distinguish it from other BMPs with similar names. The numbering convention represents...

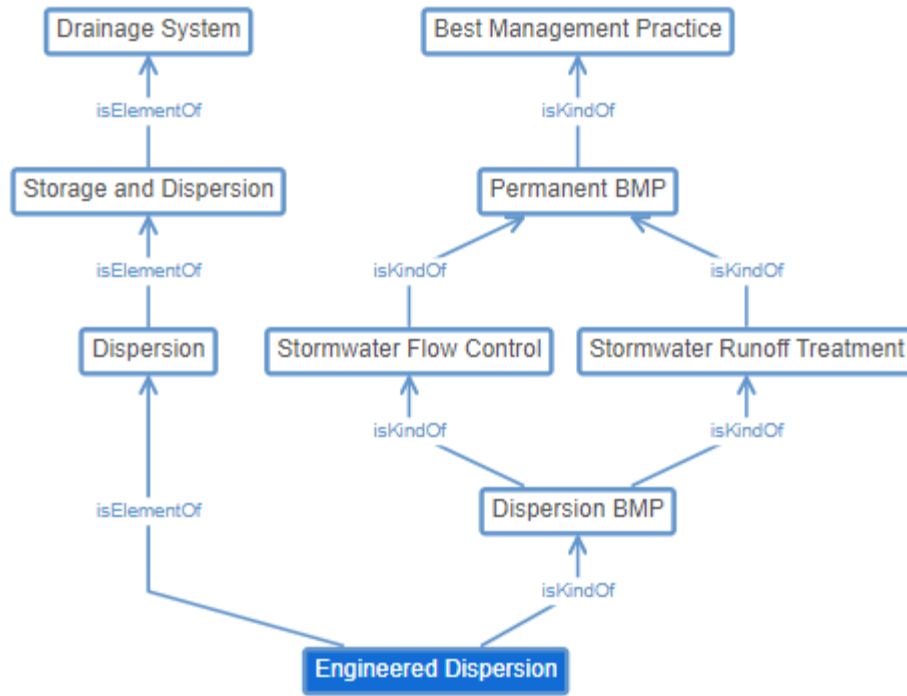
Score: 7.03

5-3 BMP Selection Process Highway Runoff Manual

This section provides guidelines and criteria on the selection of permanent BMPs for WSDOT projects. **BMP** selection is necessary to address permanent stormwater management for a project and to complete the Hydraulic Report. The following subsections outline the decision-making process for selecting BMPs for projects. WSDOT requires the use of LID techniques in all facilities...

Score: 7.02

Terms for Tagging



WSDOT Extended Transportation Ontology

Classes Properties Individuals Comments

Class Hierarchy

- owl:Thing
 - Asset
 - Drainage Asset
 - Best Management Practice
 - Permanent BMP
 - Stormwater Flow Control
 - Stormwater Runoff Treatment
 - Biofiltration BMP
 - Dispersion BMP
 - Infiltration BMP
 - Oil Control BMP
 - Phosphorus Control BMP
 - Temporary BMP
 - Drainage System
 - Collection and Conveyance
 - Energy Dissipation
 - Storage and Dispersion
 - Master Deliverable
 - Construction
 - Design
 - Design-Build Procurement
 - Environmental Review and Permit
 - Plan, Specification and Estimate
 - Project Management
 - Project Scoping
 - Real Estate Service
 - Material
 - Asphalt
 - Clay
 - Concrete
 - Iron
 - Metal
 - Rock
 - Thermoplastic
 - Practical Solutions Lifecycle
 - Project Development Topic



User Feedback

I'm reviewing the stormwater design of two separate design-build projects on the same days as well as providing stormwater support to WSDOT OR staff. Design-build moves fast. ...

Basically I successfully completed all three discussions in less than a day. **I don't know I could have accessed all of the details that fast by individually searching the pdfs.** I'm still using the indexed manuals. **I'm hoping the pilot becomes permanent because I will miss indexed manuals if it goes away.**

I would use ctrl-F to search for a keyword in the PDF manuals. This would make it much easier to accomplish this kind of search – could browse through the sections to see if they are worth clicking on.

Ensures that I'm getting info I need.

This **would be extremely**

valuable to his (Torts) office.

People that don't use the manuals as a matter of routine aren't fully aware of what manuals exist, and might not know to check all of the potentially relevant manuals.

This is definitely worth completing! I keep the site open on one screen while I review 300 page Design-Build submittals on the other.

Citations and detailed guidance that used to take me 5 to 20 minutes to look up with 3 or 4 pdf manuals open are now taking 1 to 5 minutes to complete.

For external people, it is confusing to have so many manuals to consult – **there should be a single source of information.**

... this is a vast improvement over the current system and I can already see where the new format **will be helpful to me and others in the future!**

Helpful to be able to see connections across the manuals.



Business Function Classification Schema

A tiered structure that describes:

1. Business Areas (strategy and goals)
2. Lines of Business
3. Business Processes
4. Business Subprocess
5. Business Activity

Business Value

- Enables business critical work
- Clarifies purpose of data and information
- Supports business users across the organization
- Clarifies authoritative/trusted source

Proposed WSDOT Tier 1 Business Areas



[DRAFT WSDOT BFCS](#)

Business Domains

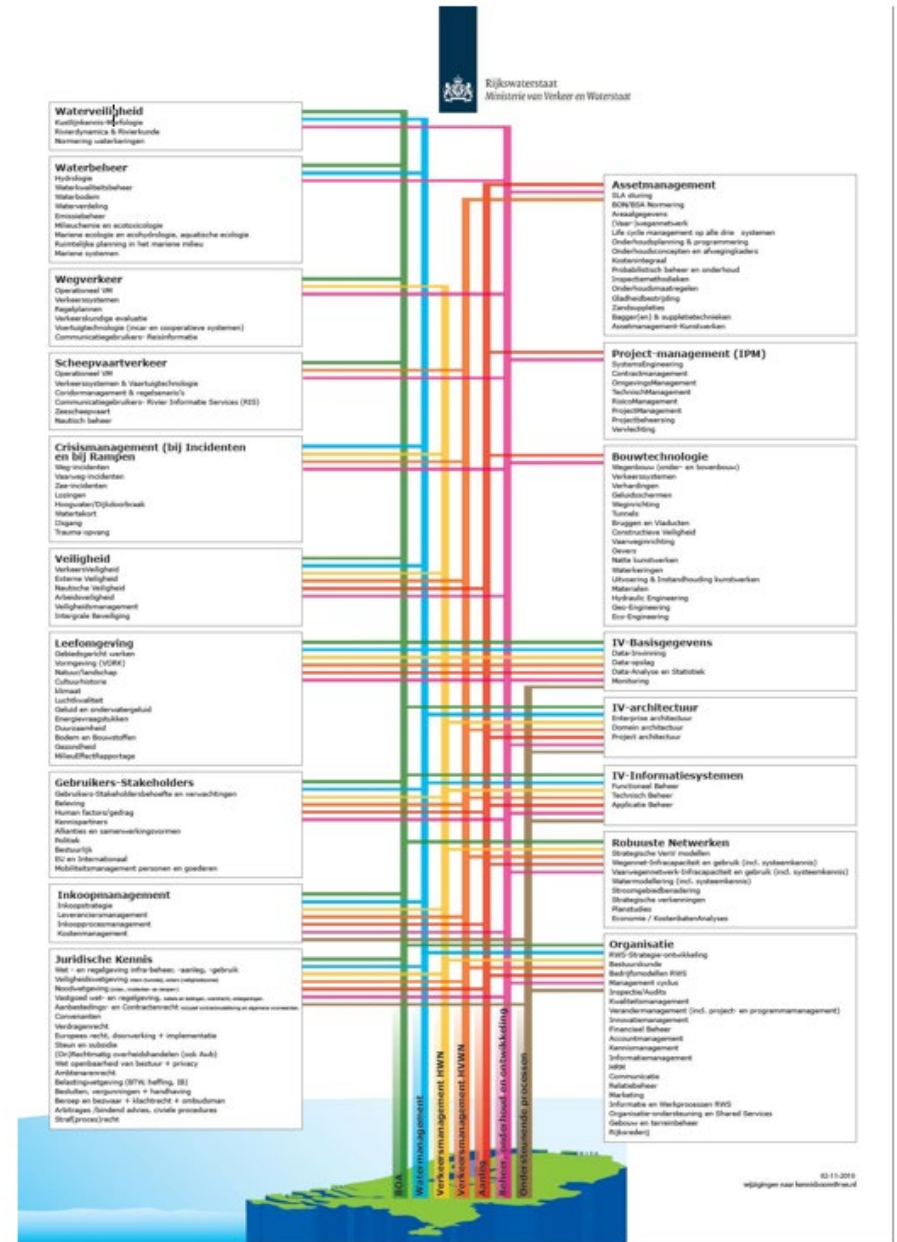
What is a domain?

- An area of knowledge with an explicit scope established for the purpose of creating a knowledge organization system.
- Examples include subjects, functions, or professional disciplines.

Why Develop Business Domains?

- Builds a communities of practice
- Supports enterprise use of data resources
- Provides context for governance

[Working Draft Business Domains and Data Governance](#)



From an October 2012 presentation by Roger Demkes, Paul van der Kroon, Anke Zindler, Rijkswaterstaat (Denmark)

WSDOT Domains

- **Many Models**
- **Proposed Top Tier Domains**
 - Business Operations
 - People
 - Physical Assets
 - System Operations
 - System Improvements
 - Knowledge & Information Resources

Figure 4-1 MnDOT Data Domains, Stewards, and Subject Areas

<p>HUMAN RESOURCES DATA DOMAIN Karin van Dyck</p> <ul style="list-style-type: none"> • Affirmative Action Data • Applicant Data • Employee Data • Labor/Management Relations Data • Position And Organization Data • Safety And OSHA Data • Training And Certification Data • Workers Compensation Data • Workforce Management And Skill Data 	<p>PLANNING, PROGRAMMING, AND PROJECTS DATA DOMAIN Mark Gieseke</p> <ul style="list-style-type: none"> • Cost Estimating And Cost Management Data • Environmental Process Data • Information Technology (IT) Project Data • Project Management Data • Research Project Data • Transportation And Construction Project Data • Transportation Investment Management Data 	<p>SUPPORTING ASSETS DATA DOMAIN Steve Lund</p> <ul style="list-style-type: none"> • Building And Facility Data • Consumable Inventory Data • Fuel Data • Information Technology (IT) Inventory Data • Fleet Data • Non-MnDOT Asset, Structure, And Facility Data • Road Materials Data • Equipment Data • Survey Control Network Data • Tower Data
<p>FINANCIAL DATA DOMAIN Tracy Hatch</p> <ul style="list-style-type: none"> • Audit Data • Budget Data • Contract And Agreement Data • Contractor, Consultant, Grantee, Vendor, And Supplier Data • Debt Data • Federal Highway Administration (FHWA) Grant Data • Fund Data • Grant Data • Local Government (State Aid) Financial Data • Prevailing Wage Data • Procurement Data • Source (Revenue) Data • Transaction Data • Trunk Highway Road Construction Letting And Contract Data • Use (Expenditure) Data 	<p>SPATIAL DATA DOMAIN Cassandra Isackson</p> <ul style="list-style-type: none"> • Aerial Photo Data • GIS Area Based Data • GIS Linear Based Data • GIS Point Based Data • Interchange, Intersection, And Section Data • Mapping Data • Survey Data 	<p>REGULATORY DATA DOMAIN Betsy Parker</p> <ul style="list-style-type: none"> • Aircraft Registration Data • Commercial Vehicle Regulation And Inspection Data • Commissioner's Orders And Resolution Data • Complaint And Investigation Data • Delegation Of Authority Data • Disadvantaged Business Enterprise (DBE) Application, Certification, Goals, And On-The-Job Training (OJT) Data • Enforcement Data • Equal Employment Opportunity (EEO) Data • Functional Class Data • Legislative Data • Permits And Licenses Data • Rail Crossing Regulation Data • Speed Limit Authority Data • Tariff Data • Tort Claim Data
<p>INFRASTRUCTURE DATA DOMAIN Todd Broadwell</p> <ul style="list-style-type: none"> • Airport Data • Bicycle/Pedestrian Data • Bridge Data • Drainage Structure Data • Parking Facilities Data • Rail Crossing Data • Right Of Way And Contaminated Property Data • Roadway Data • Safety Feature Data • Smooth Road Data • Traffic Control Device Data 	<p>RECORDED EVENTS DATA DOMAIN Sue Groth</p> <ul style="list-style-type: none"> • Air Passenger Data • Archive Data • Bicycle And Pedestrian Count Data • Commodity Movement Data • Construction Diary Data • Crash And Accident Data • Data Practices Data • Emergency Management Data • Extra Ordinary Enforcement Data • Global Sensor Data • Intelligent Transportation System (ITS) Data • Local Events Managed By MnDOT Data • Maintenance Activity Data • Material Testing Data • Performance Measurement Data • Radio Communication Data • Roadway Condition Data • Subsurface Utility Marking Data • Traffic Count, Traffic Monitoring, And Weight Data • Traveler Information Data • Video Log Data 	<p>BUSINESS STAKEHOLDER / CUSTOMER DATA DOMAIN Karla Rains</p> <ul style="list-style-type: none"> • City And County Partner Data • Customer (Public, Market Research) Data • Internal And External Communication Data • Modal Stakeholder – Aeronautics/Airport Data • Modal Stakeholder – Bicycle/Pedestrian Data • Modal Stakeholder – Commercial Vehicle Data • Modal Stakeholder – Railway And Commercial Freight Data • Modal Stakeholder – Waterway Data • Tribal Partner Data

Last Updated: 08/10/2012



Resources

Reports

- WA-RD 896.1 [Improving Knowledge and Information Management for Practical Solutions at WSDOT: Executive Summary](#)
- WA-RD 896.2 [Resource Models for Practical Solutions at WSDOT](#)
- WA-RD 896.3 [Improving Information Management for Practical Solutions at WSDOT](#)
- WA-RD 896.4 [Enterprise Information Architecture: An Overview](#)
- WA-RD 896.5 [Words Matter: Managing Vocabulary Resources to Support Productivity](#)
- WA-RD 896.6 [WSDOT Manual Modernization: Scoping](#)
- WA-RD 896.7 [WSDOT Manual Modernization: Pilot](#)
- NCHRP Report 947 [Implementing Information Findability Improvements in State Transportation Agencies](#)

Let's Connect!

Thanks for your attention today. Please contact us if you'd like to continue the conversation.

- Leni Oman, Knowledge Strategist
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- Andy Everett, Data Curator/Taxonomist
EveretA@wsdot.wa.gov
- Kathy Szolomayer, Head Librarian
SzolomK@wsdot.wa.gov
- Christy Granquist, Librarian
GranquC@wsdot.wa.gov



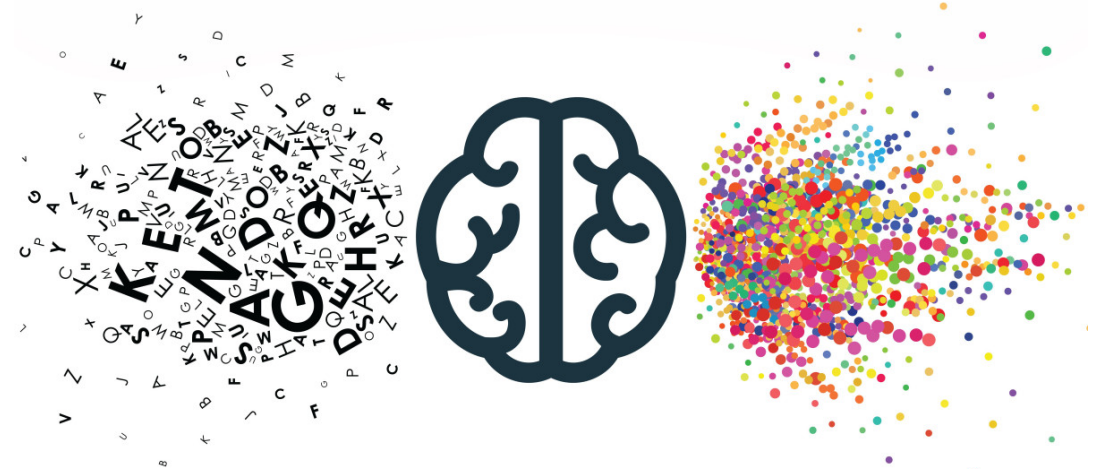
[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

How mature is your agency practice related to metadata, taxonomies, glossaries, ontologies and thesauri?

Please go to Menti.com

Type in the code:

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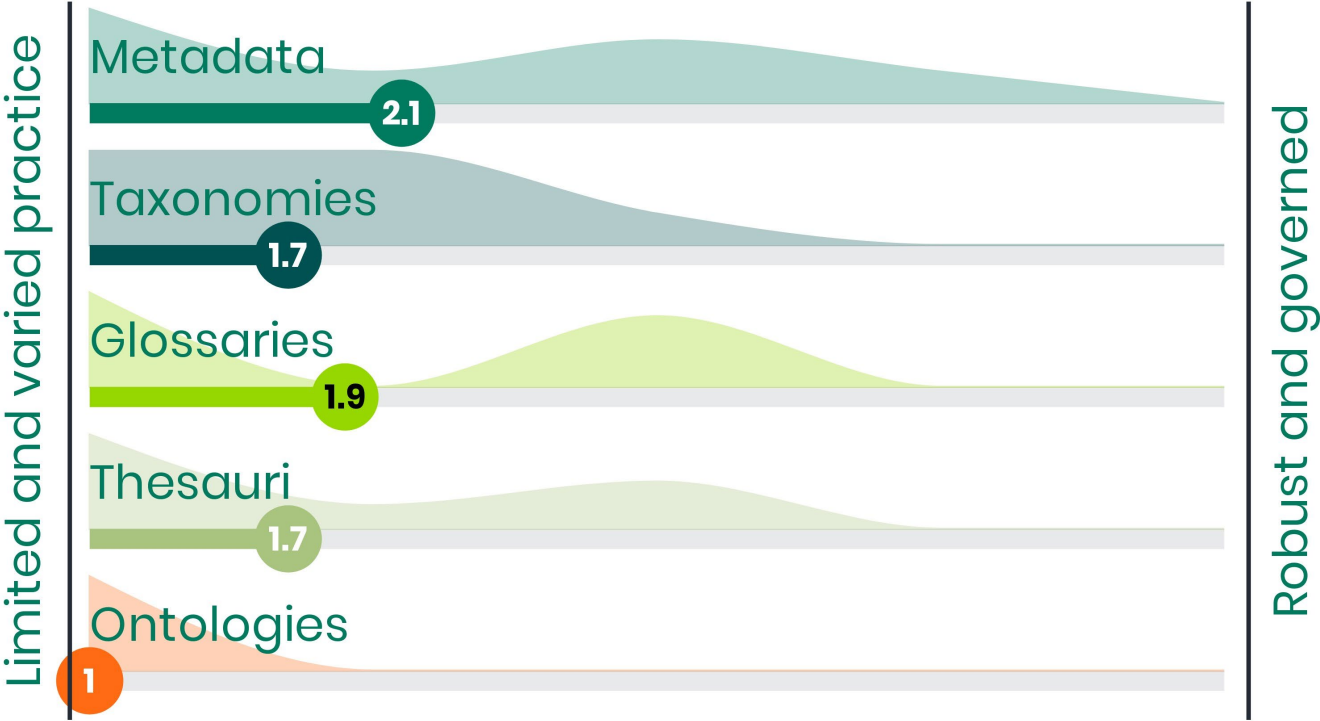


As machine learning and AI gain a better grasp of language, larger elements of language will be subject to analysis and optimization.

Alex Vratskides, Persado

[Source](#)

How mature is your practice related to the following?



How would vocabulary management help your organization?

Please go to [Menti.com](https://www.menti.com)

Type in the code:

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“All our work, our whole life is a matter of semantics, because words are the tools with which we work, the material out of which laws are made, out of which the Constitution was written. Everything depends on our understanding of them.”

— Felix Frankfurter



How would vocabulary management help your organization?

Avoid confusion over same term used for different things

Search, discovery, resource management. Greater/shared business understanding.

It would improve the ability to locate documents. Our department produces many documents and it's not easy to locate them.

It would definitely make it easier to find reports & other resources in our Document Management System.

would help to locate documents and help staff better understand how the vocabulary within their own disciplines translates to the peer-reviewed literature and other project documentation in which they are involved

