Colorado GIS Coordination Summit
CO GIS Coordination and Development Program

June 22, 2016

COLORADO
Governor's Office of
Information Technology

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GIS Coordination &
Development Program
Governor's Office of Information Technology

Why Are We Here?

➤ Last summit agreed to annual summit and inter-annual update call

➤ Continue feedback process, course correct

➤ Strategic and tactical

➤ How should we meet mandate and bring max value to you?

➤ Engagement in coordination
- o Long & short term goals
- o How to measure progress on goals

➤ Continue development of GIS community

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Agenda

8:00 - 8:30 Check in, coffee, continental breakfast

8:30 - 8:45 Welcome, introductions

8:45 - 9:15 Coordination update

9:15 - 9:30 Div. of Homeland Security and Emergency Management

9:30 – 10:15 Strategic input activity

    Facilitator: Matt Tricomi, Xentity Corporation

10:15 - 10:30 Break

10:30 - 11:00 Tactical input activity

11:00 - 11:45 Lightning updates on data and business segment activities

11:45 - 1:00 Lunch, round robin feedback on data and projects

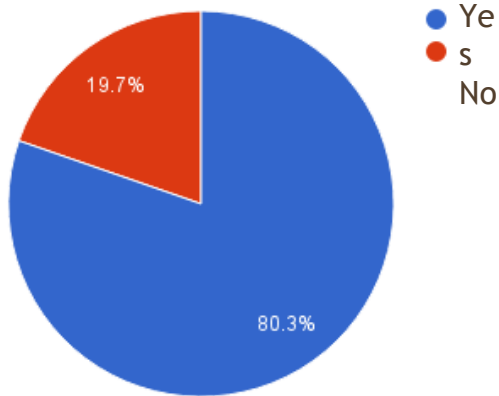1:00 - 1:15 Report out and structured discussion on feedback from lunch

1:15 - 1:35 Follow up and open discussion on tactical and strategic input

1:35 - 1:45 Wrap up

Special thanks to Xentity Corporation for assisting & facilitating

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Responses to 2016 GIS Summit Survey

Aware of Data Available through State Coordination

- Ye
- s
  No

19.7%

80.3%

Avg. Use of Data Sets Available through State Coordination

- Accessed once or more
- Never accessed

19.7%

80.3%
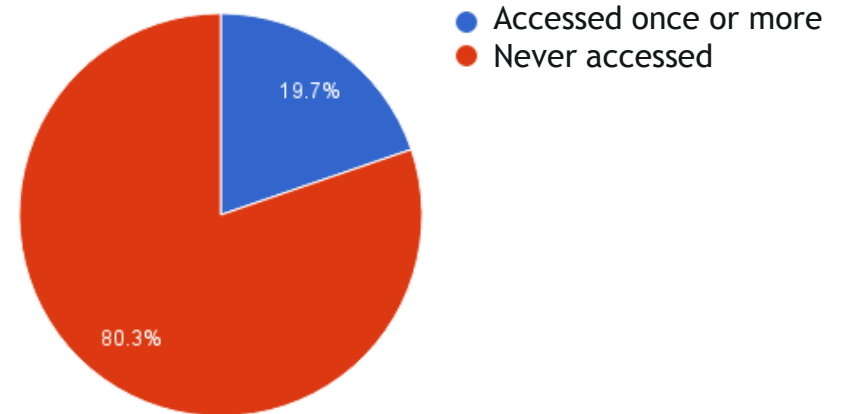
How should data be improved:
- More consumable map services to run with our existing map services
- Not sure where to find the datasets
- Complete statewide layer (3)
- Have the data on a server for state agencies to use while in ArcGIS
- Hosted web services, continually up-to-date
- More data specific to work
- Local 911 agencies need PSAP boundaries, center lines, parcel data, and emerg service zones.
- Centerlines
- There needs to be an easier way to access LiDAR
- CAI has ugly, uninformative symbology
- Better searchability

What I'll be Talking About

➢ Historic and current context

➢ Last year's summit and tactical plan

➢ Data call and stewardship

➢ GIS Products and Services

➢ Chief Data Officer role and overlap

Where We've Been

Colorado GIS Portal and Clearinghouse

http://coloradogis.nsm.du.edu

Participate in Geospatial Discovery!

To Advance Statewide GIS Coordination and Infrastructure

Colorado GIS Coordination Strategic Plan

DRAFT

Version 1.0

From: Douglas Friednash - GovOffice <djfriednash@state.co.us>
Date: April 15, 2015 at 4:27:39 PM MDT
To: GOV_ExecutiveLeadership <gov_executiveleadership@state.co.us>
Subject: GIS Coordination

Governor Hickenlooper has asked OIT to coordinate and assemble geographic data to make it fully visible and accessible. This is particularly critical after emergencies like 2013's catastrophic flooding. OIT's GIS coordination role is mandated in statute, but accomplishing this significant coordination of GIS data requires resources and cooperation by state agencies that maintain this data. I would like to ask for your help in directing your staff that manage GIS data to assist with this data coordination and transparency effort. This will require a small time commitment on their part, and OIT staff will actively assist to mitigate such time requirement. Jon Gottsegen, is leading these efforts from OIT and is the State GIS Coordinator, and will be reaching out to the appropriate contacts within your agencies. Your help in ensuring prompt responses from your agencies is greatly appreciated and needed.

Here is Jon's contact information should you have questions or want further detail: jon.gottsegen@state.co.us, 303-764-7712.

Thank you in advance for your support and cooperation. Coordinating this data across Colorado and making it easily accessible will be so valuable for our state, especially in emergency situations.

Douglas J. Friednash
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Gov. John Hickenlooper
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Denver, Colorado 80203
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www.colorado.gov

OIT
Office of Information Technology

Prepared for the State Chief Information Officer

November 2009

3-7-03

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State Coordination Now

➢ Staff supporting GIS coordination and broadband data collection

➢ Server architecture with ArcGIS Server, GeoData Cache and FTP site

➢ Multiple access points to data

➢ Shared licenses

➢ Supporting CDA, History Colorado, State Land Board, Emergency Management, CO Energy Office, Dept. of Labor and Employment, Div of Water Resources, CO Water Conservation Board

➢ Maturing efforts in statewide data

Of course there are mature and growing GIS efforts among state agencies.

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GIS Outreach Coordinator	Senior GIS Analyst	Senior GIS Analyst	GIS Analyst	GIS Technician	GIS Technician	GIS Technician	Senior GIS Analyst
Nathan Lowry	**Kass Rezagholi**	**Kathy Metivier**	**Jim Snyder**	**Tudor Stanescu**	**Tony Filipiak**	**Brent Seiferd**	**Windy Fischer**
- Co-lead statewide address file stewardship -Outreach to and collection of data from local and state entities - Support emergency management work group - Assist in coordination of other enterprise data	- Lead broadband data processing - Develop and maintain GIS applications for state agencies and OIT - Support web services	- Maintain GIS servers and server software and versions - Administer web services - Manage FTP site access - Contribute to trails data stewardship	- Parcel data primary steward - Support economic development work group - Assist with project and operational management - Manage updates of big data to GeoData Cache	- Process broadband data - CAI data primary steward - Other data processing and analysis duties and as necessary for broadband data development	-Collect and process broadband data - Parcel data secondary steward - Other data processing and analysis duties as assigned	- Collect and process broadband data - Other data processing and analysis duties as assigned	- Maintain enterprise and OIT spatial databases - Co-lead statewide address file stewardship -Support CO resiliency work - Assist with application development

➢ Mission

We realize the full value of geographic information systems by making access to comprehensive data – including broadband service data – seamless and formatted in a way that maximizes its benefit to decision-making in the state. We are a place where Coloradans can gain answers and expertise about GIS and its possibilities in order to expand the value of these technologies as efficiently and effectively as possible, and we are the facilitator of a robust GIS community where knowledge and information is shared freely.

➢ Objectives

- Get data in one place, and then make state data open and accessible unless it contains PII, security sensitive or proprietary information.

- Organize data necessary for critical applications.

- Reduce the cost and overhead for data sharing.

- Maximize the utility and value of data.

- Enhance and support GIS use among state and local entities.

- Increase data governance maturity.

➢ Guiding Priniciples

- Create or ask for data once, use it many times.

- While potentially slower in the short term, collaboration is cheaper in the long term.

- The value of data increases with use.

- Where not restricted by privacy, security or proprietary (e.g. data license) considerations, data should be open.

- More eyes on, or more use of data, may demonstrate applications not thought of previously.

- Coordination should not hinder the work of state agencies and should bring value to agencies' work.

Rankings of Mission Areas

Folks attending the Summit activity May 2015 in Denver ranked business segments that would benefit from or require geographic information most. In Montrose, participants divided into three groups and discussed their highest priority business areas.

Front Range 2015

1. Emergency Management & Response (41)

2. Transportation (23)

3. Economic Development (18)

4. Law Enforcement & Public Safety (17)

5. Information and Technology Management (17)

6. Environmental Management (16)

7. Water (16)

8. Natural Resources (14)

9. Planning and Resource Allocation (11)

West Slope 2015

1. Emergency Management & Response (3 groups)

2. Economic Development (2 groups)

4. Water (1 group)

3. Planning and Resource Allocation (2 groups)

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What data is critical to the Top Mission Areas?

Front Range 2015

Priority	1	2	3	4	5
Emergency Management	Structures - **Addresses** (map, feature, geocoding)*	Transportation - **Roads**	Boundaries - Government Units: **State, County, Municipal, District**	Imagery - **High Resolution**: Municipal, County and Metro	Structures - **Community Facilities** (map, feature, geocoding)*
Transportation	Transportation - **Roads**	Transportation - **Railways**	**Transportation** - Other: **Air, Bike, Sidewalks, etc.**	Boundaries - Government Units: **State, County, Municipal, District**	Structures - **Addresses** (map, feature, geocoding)*
Economic Development	Transportation - **Roads**	Structures - **Addresses** (map, feature, geocoding)*	Land Ownership and Use - **Parcels** (map, feature, geocoding)*	Transportation - **Railways**	Society - **Demographics**: Population
Law Enforcement	Transportation - **Roads**	**Imagery - High Resolution**: Municipal, County and Metro	Recreation - **Trails**	Structures - **Addresses** (map, feature, geocoding)*	Land Ownership and Use - **Parcels** (map, feature, geocoding)*
Information Technology	Transportation - **Roads**	**Imagery - High Resolution**: Municipal, County and Metro	Recreation - **Trails**	Boundaries - **Public Lands: Federal, State, and Local**	**Imagery - Lower Resolution**: Regional, State and National **NAIP** (2011, 2013, 2015)

West Slope 2015

Priority	1	2	3	4
Emergency Management	Structures - **Addresses** (map, feature, geocoding)*	Transportation - **Roads**	Land Ownership and Use - **Parcels** (map, feature, geocoding)*	**Imagery - High Resolution**: Municipal, County and Metro
Economic Development	Transportation - **Roads**	Land Ownership and Use - **Parcels** (map, feature, geocoding)*	Land Ownership and Use - **Land Use and Land Cover**	
Law Enforcement	Structures - **Addresses** (map, feature, geocoding)*	Structures - **Community Facilities** (map, feature, geocoding)*	Transportation - **Roads**	Recreation - **Trails**

Priority	5	6	7	8
Law Enforcement *(continued)*	Land Ownership and Use - **Parcels** (map, feature, geocoding)*	Boundaries - Government Units: **State, County, Municipal, District**	Boundaries - Government Units: **911 PSAPs/ESZs**, COGs/EDCs, etc.	**Imagery - High Resolution**: Municipal, County and Metro

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Tactical Plan

➢ Plan derived from coordination summit July 2015

➢ Outline

- GIS coordination vision, objectives, and principles

- Brief description of the current GIS landscape

- Report on the GIS Data Coordination Summit

- Description of coordination tasks for fiscal year

- High level milestones

Data Stewardship

Task	Milestone	Status
Begin integration of parcel data for counties not included in GoCode effort	September 2015	Done
Acquire LiDAR data in priority areas identified with CO Water Conservation Board, CO Geological Survey and others	September 2015	In process
Complete incorporation of Anchor Institution changes from local government data	Q4 FY16	Done
Incorporate address data changes from local government data	Q3 FY16	In process
Assist with completion of special district boundary compilation	Q2 FY16	N/A
New call for local data not provided on continuous basis or for specific project needs	March 2016	Done
Complete integration of county parcel data, publish service	Q3 FY16	Public done/In process
Continue to upload LiDAR and image data to GeoData Cache	Ongoing	Ongoing
Meet/coordinate with state agencies to publish data in CO Information Marketplace	Ongoing	Ongoing

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Business Area Coordination		
Task	**Milestone**	**Status**
Identify emergency management GIS needs and opportunities with Div of Homeland Security and Emergency Management	March 2016	Done
Convene multi-jurisdiction EM working group	September 2015	Focusing on Div first. Multi-jurisdiction: June 2016
Publish blueprint for EM data and product sharing	June 2016	Done
Stage emergency management data and convene data sharing exercise	September 2016	
Convene multi-agency working group for economic development to explore GIS contribution and data needs	Q2 FY16	Done
Publish GIS blueprint for Economic Development	Q4 FY16	Done
Convene multi-agency working group to coordinate GIS for additional business area	Q4 FY16	Decided to hold off from additional external group

Data Call

Data Under Active Stewardship

➢ Broadband Service: Speeds, type and price of broadband service across state. Used to estimate % households with broadband service. Available on broadband.co.gov and Colorado Information Marketplace (CIM) at data.colorado.gov

➢ "Community Anchor Institutions": Public safety, education, health care, higher education and other government facilities available through web services and download from CIM.

➢ Address Points: Point locations of addresses. Estimate 95-98 percent of addresses in state are covered and available through web services, download and geocoding service.

➢ Parcels: 22 counties have been integrated into a public standardized, single data set available on CIM. Remaining counties will be integrated by end of June.

➢ LiDAR: Local and state LiDAR data distributed through GeoData Cache (geodata.co.gov)

And other agencies:

➢ Municipal boundaries: Maintained by Department of Local Affairs (DOLA) through annual updates of annexations available through DOLA's ArcGIS Online org.

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Contributor Statistics for 2014-2016

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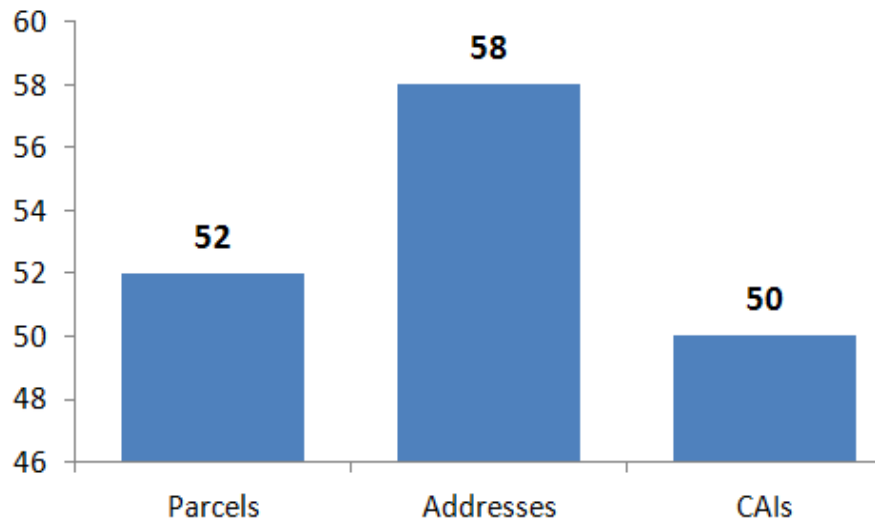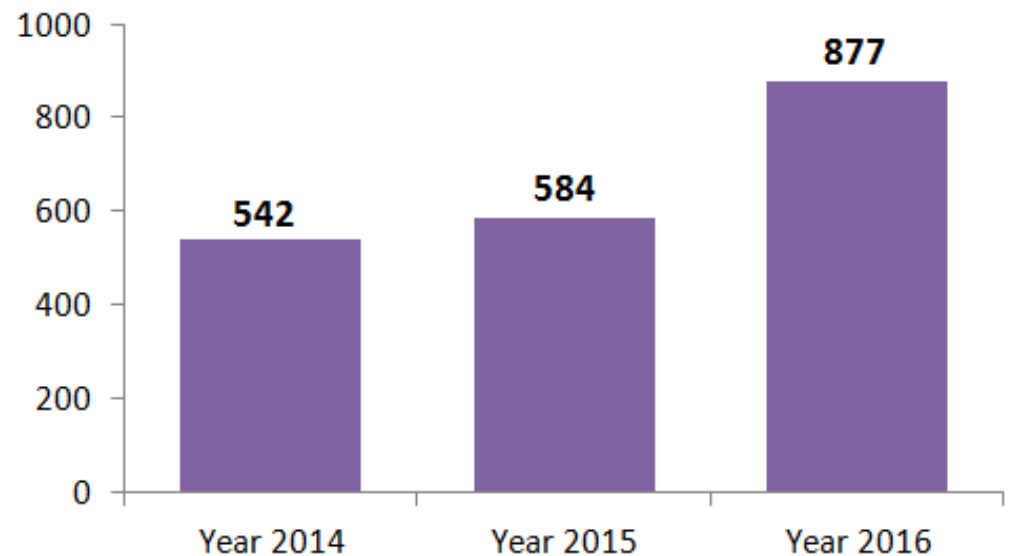
Where Do We Put It?
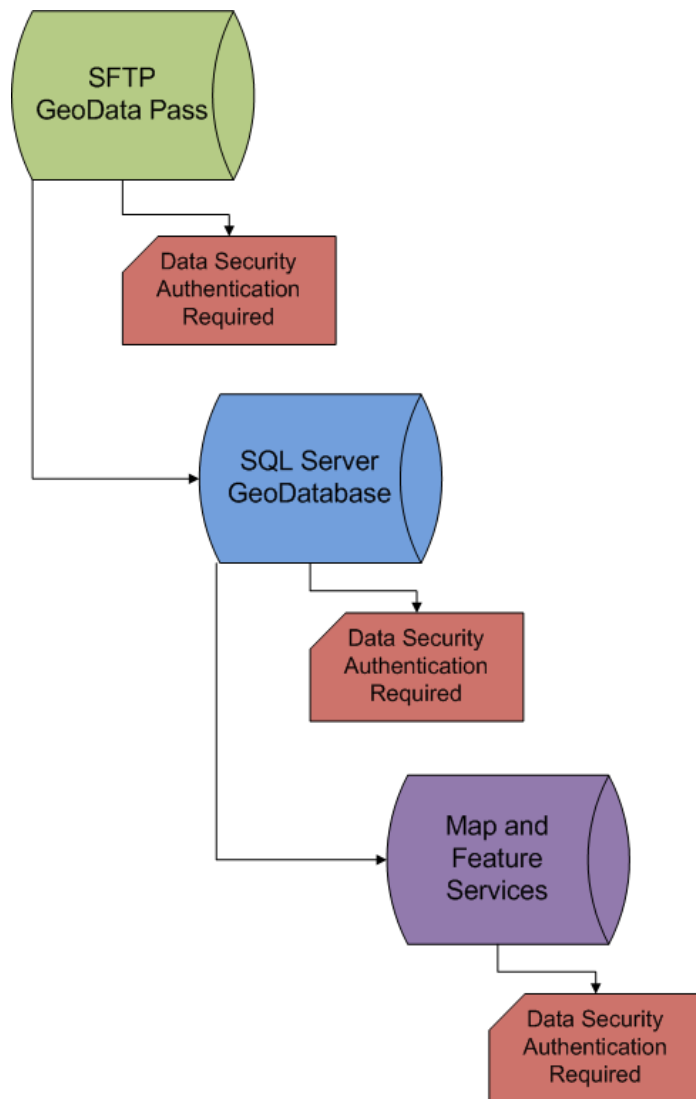
➢ Data Received

  • Data security controlled by user authentication

➢ Data Migrated in SQL Server GDB

  • Data security controlled by SQL Server and Active Directory user authentication

➢ Public Data Published as Services

  • Data security controlled by ArcGISServer and Active Directory user authentication

Data Governance & Maturity

➢ GIS data governance group

- Data inventory

- Authoritative data sources

- Governance for CO Information Marketplace
  (http://data.colorado.gov)

➢ Updating data inventory spreadsheet from 2010
  (1.usa.gov/25noBR1)

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Metadata? Ugh...

			Accept all mandatory entries. As enterprise evolves, include Mandatory if applicable entries. Point of Contact agency will be sited.			
1		**Identification**				
	1.1	**Citation**	Information used to reference data set			
	8.1	**Data Steward**	Agency that maintains the data	Free Text		
		Publisher	Agency publishing the data (ie. Making it public/discoverable)	Free Text		
	8.2	**Publication Date**	Date data set is made available for discovery and/or access	Date	mm/yyyy	
	8.4	**Title**	Name of the data set	Free Text		
	1.2	**Description**	Description, require geometry type (point, line, area)			
	1.2.1	**Abstract**	Brief narrative summary of the data set - Include: general content and features, data form (e.g., GIS, CAD, image, Dbase, etc.), geographic coverage (state, county, city name, etc.), time period of content (begin/end data or single date), special characteristics or limitations, Building & Landmarks (Distance Learning)	Free Text		
	1.2.2	**Purpose**	Summary of the intentions with which the data set was developed -- reasoning on why data set is valid.	Free Text		
		Processing steps				
	1.3	**Time Period**				
	9.1.1	**Year**	Time period(s) for ground condition of the data	Date	mm/yyyy	
	1.4.2	**Maintenance and update Frequency**		Enumerated	Continually, Daily, Weekly, Monthly, Anually, Unknown, As needed, None Planned	
	1.6	**Keywords**				
	1.6.1	**Theme**				
	1.6.1.1	Theme and place Keywords		Enumerated	Philosophy more than specific list of key	
	1.7	**Access Constraints**	Data security classification level from data security classification policy	Enumerated	Public, Low, Moderate, High (public/pro	
	1.9	**Point of Contact**	Contact information for data set	Free text	Name, Organization, phone, email	
	1.11	**Data set Credit**	Reference the Data Governance Plan & stewardship plan	Free text		
2		**Data Quality**				
	2.4	**Positional Accuracy**	Rather than an real number measure of horizontal displacement from a baseline, this is an indication of the compilation method and therefore the general quality and appropriate use of the data set.	Enumerated	See data collection method list below.	
4		**Spatial Reference**				
	4.1	**Horizontal Coordinate System**	Use ArcCatalog's names for Coodinate Systems	Enumerated	ArcInfo Projection Names	
5		**Entities and Attributes**				
	5.2	**Attribute/Overview Information**	Include attribute name, definition, type and domain information			
		Distribution Information				

Products & Services

Data Services

Application Services

Business Support Services

Hosting Services

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Products & Services

Data Services

Application Services

Business Support Services

Hosting Services

Includes all manner of data acquisition, cleansing, standardization, representation and analysis

➢ **Data Products** - *Spatial and Non-spatial data standardized and packaged for use*
➢ **Map Products** - *Vector and raster data overlays with customized symbology and additional standard cartographic components*
➢ **Data Management** - *Evaluation, modification, and standardization of spatial and non-spatial data with associated metadata*
➢ **Data Analysis** - *Cleansing and analysis of data; associated data processing automation through scripts and models*
➢ **Stewardship** - *careful and responsible management of data acquisition, data discovery, and data development*
➢ **Technical Support** - *Provide technical solutions for product issues*
➢ **Data Web Services** - Data web services includes creating access to data for distribution purposes.

Products & Services

Data Services

Application Services

Business Support Services

Hosting Services

Provides custom application development, management, and support through skillful design, technical solutions and diverse platforms

➢ **Application Development** - *Discover, Design, Develop, Test, and Deployment of GIS web mapping applications.*
➢ **Application Management** - *Application management delivers a stable production environment , the updating of legacy applications, and the creation of new functionality.*
➢ **Development Support** - *Development support includes providing 3rd party developers data access and deployment guidance to ensure a successful delivery.*

Products & Services

Data Services

Application Services

Business Support Services

Hosting Services

Integrates professional experience with project solutions through best practices, consultations, training and technical assessments

➢ **Consulting** - *Assess technological needs, product solutions, provide training and guidance in best practices*
➢ **Project Management** - *Assist in procurement, prototyping, licensing, and tool generation*

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Products & Services

Data Services

Application Services

Business Support Services

Hosting Services

Hosting services includes REST services, WMS, GIS License services, application hosting and hosting support

➢ **Hosted Applications and Services** - *Hosting applications includes GIS , non-GIS websites or services.*
➢ **Hosting Support** -*Hosting support includes technology and platform troubleshooting once service is hosted.*
➢ **Geospatial Hosting** - *Geospatial hosting includes the deployment of GIS services from data provided by end user.*
➢ **GIS License Services** -*GIS license services includes software license pooling for organization uses.*

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```
369    var qt = new QueryTask(opsURL);
370    var query = new Query();
371    query.where = "1=1";
372    query.objectIds = [buffer
373    que
374    query.outFields = ["*"];
375    qt.execute(query, function (r        ) {
376        var data = array.map(results.features, function (feature) {
377        return {
```

Application Services

Application services provides custom application development, management, and support through skillful design, technical solutions and diverse platforms.

Learn more

Data Services

Data products and services includes all manner of data acquisition, cleansing, standardization, representation and analysis.

View details »

Business Support

Business support services integrates professional experience with project solutions through best practices, consultations, training and technical assessments.

View details »

Application Services

Application services provides custom application development, management, and support through skillful design, technical solutions and diverse platforms.

View details »

Hosting Services

Hosting services includes REST services, WMS, GIS License services, application hosting and hosting support.

View details »

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Chief Data Officer – Why?

Enterprise Data

- Open data
- Data sharing
- Interoperability
- Governance
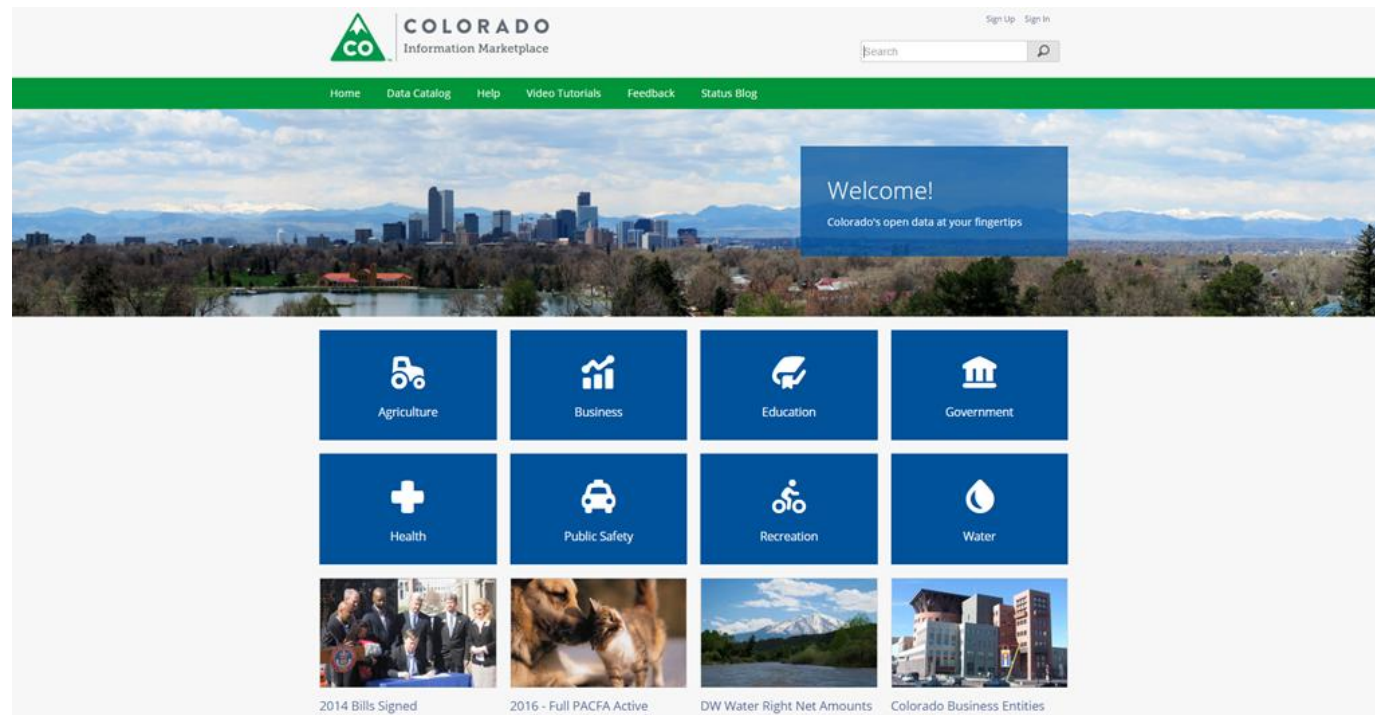- GDAB

GIS Coordination

- Data discovery (open data)
- Data sharing/access
- GIS data stewardship
- GIS data governance
- GIS services/support
  - Hosting
  - "consulting"

Chief Data Officer - Why?

CDO
- Interoperability
- GDAB

Data
- Open data
- Data sharing
- Governance

GIS
- Data Stewardship
- GIS services/support
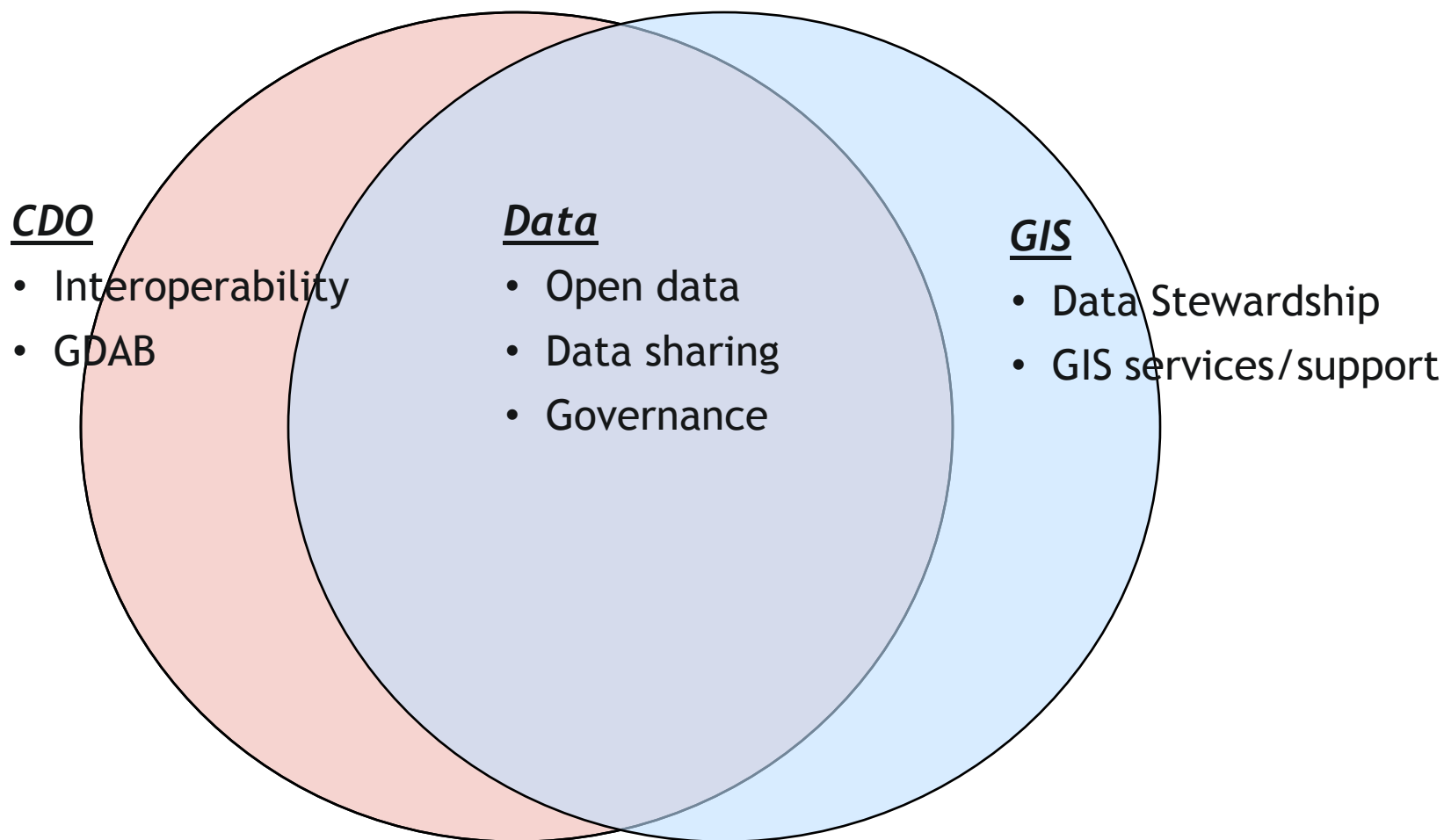
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What's the Deal with Open data

➢ Open/expose state data

➢ Colorado Information Marketplace (data.colorado.gov)

➢ Single state branded place to "discover" state data assets
　➢ Discovery, not necessarily access

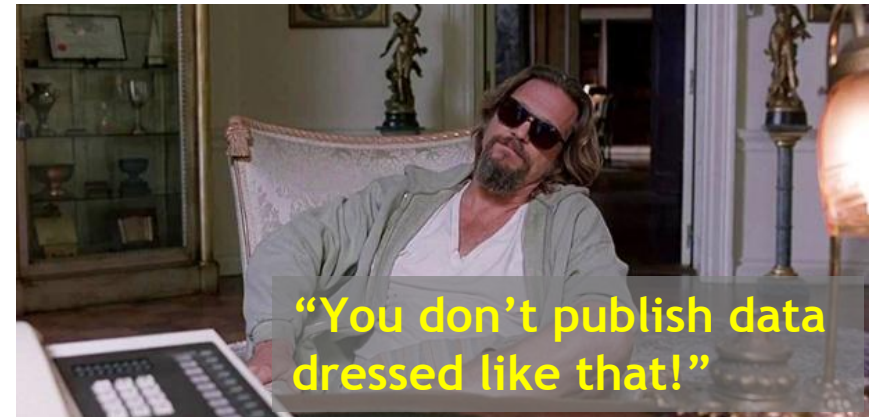➢ Data transparency necessary but not sufficient for gov't transparency
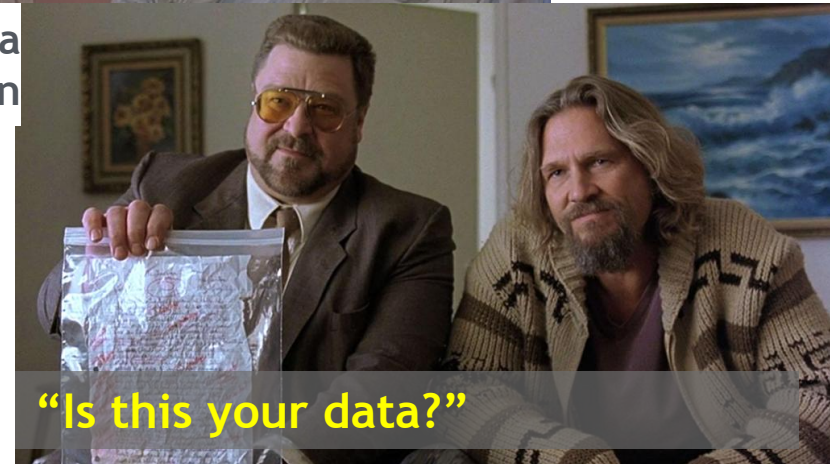
Open data issues

Value proposition

Manual effort

"You don't publish data dressed like that!"

"What's in it for me?"

Repeatability

"Do it again? That's just, like, your opinion, Man."

Open ended-ness

Data Duplication

"Our data is very complicated, Man. Lotta ins. Lotta outs."

"Is this your data?"

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Strategy for Open Data Issues

➢ Value
- • More exposure for data
- • Reduction in data requests

➢ Literally takes 1 minute to publish data, BUT working on more automated methods:
- • DWR has script to harvest data from internal DB and publish
- • Staging server approach
- • Testing ESB -> CIM

➢ Focus data requests
- • Public data only
- • Specific subject domains
- • Scrub web pages
- • DB discovery (ER Studio, Troux)

➢ "External data"
- • Links to services/APIs

➢ Review functional needs of open data portal

Data sharing pain points

➢ Currently point-to-point

➢ Individual agency/program data sharing agreements

- Significant time & AGO spend

➢ Difficult or no governance of data sharing agreements/relationships

➢ Ad hoc decisions on data sharing

- Default position should be "How do I share" not "Should I share"

➢ Agencies under regulatory constraints subject to legal and political repercussions (HIPAA, FERPA, FTI, CDE, etc.)

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Data sharing opportunities

➢ Standard <u>framework</u> for agreement

- Single universal agreement not feasible

➢ Governance

- Standard terminology
- Recommended governance procedures
- Governance committees

➢ Repository of agreements

➢ Pre-approved language

➢ Enterprise Service Bus

- Series of connectors or APIs for data
- Data as a service

Government Data Advisory Board

➢ Formed by statute to develop policies and procedures for data sharing

➢ Membership defined by statute

➢ Mandated during push for state longitudinal data system

- Education data subcommittee

➢ Objectives:

- Open data advisory board
- Data sharing agreements
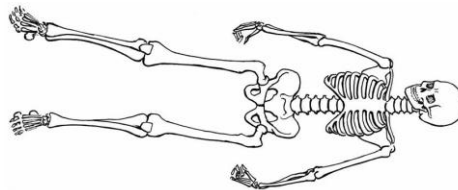- Governance best practices
- ROI for data sharing

CAUTION LAND MINES

Top down

One size fits all

No value to agencies

We own it

Overuse of authority

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Data maturity

➢ Beyond data availability