



The data consortium consists of Denver Regional Council of Governments members and regional partners with an interest in geospatial data and collaboration. The data consortium newsletter improves communication among local geographic information systems professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

DRCOG's open data drives economic development

Article submitted by Karl Urich, president, BuildingFootprintUSA. Karl can be reached at karl@buildingfootprintusa.com.

Publicly produced data — made available to commercial, academic and nonprofit organizations for unrestricted use — can be used in beneficial ways that the original data producers couldn't even imagine.

BuildingFootprintUSA, based in Albany, New York, collects building footprint geospatial data from hundreds of sources nationwide and turns that data into a product. We license our products to industries as diverse as insurance, telecommunication, real estate, utility and mobile advertising.

For example, an insurance company can use building footprint-based address information to make more accurate determinations regarding whether a property is exposed to peril (such as hurricanes or floods). A telecom company might use the data to understand their existing cellular coverage and determine where it would be best to build a

cell tower. A solar energy company can quickly identify the best rooftops for installations that meet its build-out criteria.

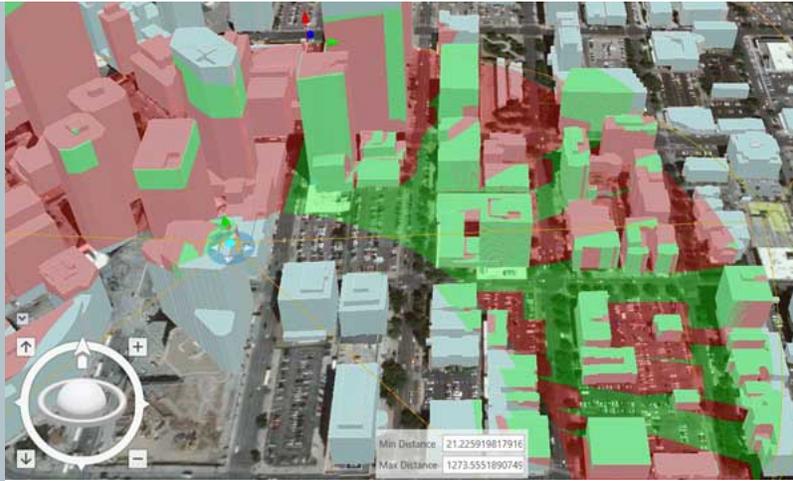
Open data makes it possible for us to collect the work of many and transform it into a product that supports national and local businesses. As a startup, it would be impossible for us to create such data ourselves. DRCOG data is an essential part of our nationwide product. As entrepreneurs who have become experts at determining the quality of public data, we assert that DRCOG data is in the top 10 percent of all data we have uncovered.

As we aggregate open data into our BuildingFootprintUSA products, DRCOG data is being used in innovative ways that benefit the residents of the region.

Below: A real estate analytics company can use building footprint data and assessor data to visualize properties by use code (color) and valuation (height) in Arapahoe County.



Below: A wireless telecom company placing rooftop infrastructure can visualize the infrastructure viewshed then perform complex radio frequency propagation analysis in downtown Denver.



Planimetric data provides insight into urban clear zones, street trees and road safety

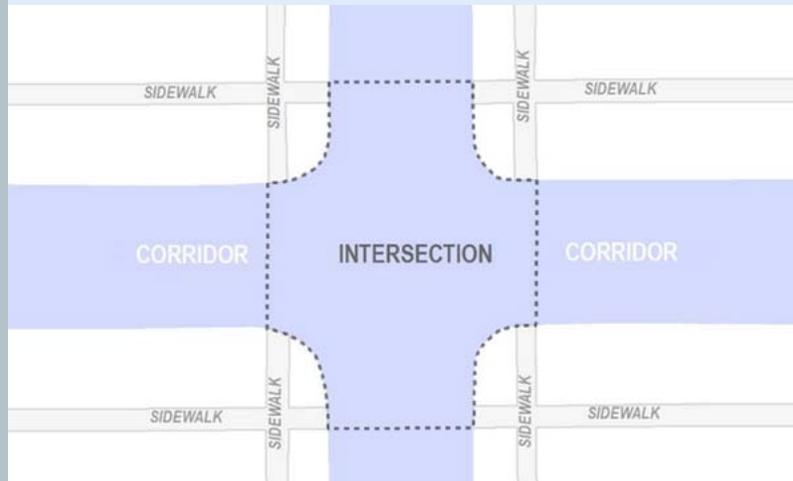
Article submitted by Dr. Wes Marshall and Nicholas Coppola, University of Colorado Denver. Wes can be reached at wesley.marshall@ucdenver.edu, and Nick can be reached at nicholas.coppola@ucdenver.edu.

Since the 1960s, transportation engineers have followed the practice of establishing clear zones along the roadside area where fixed-object hazards are explicitly minimized. Mounting evidence, however, is beginning to cast doubt on what we think we know about the effect of roadside clear zones on actual safety outcomes. For example, street trees in urban contexts – which provide economic, environmental and livability benefits – are also widely considered to be a road-safety detriment. Using spatial data, we reviewed the association between street tree location and tree canopy coverage of select roadways in Denver relative to crashes across different severity levels.

We collected data for our research from multiple sources, including extracting road corridor and intersection areas identified in [DRCOG's edge of pavement data set](#) and crosswalks identified in [DRCOG's sidewalk data set](#). DRCOG's data saved time and greatly improved the quality of our research.

Results suggest that the expected road safety benefit of reduced clear zones in urban areas may be overstated. In fact, when controlling for other known factors, street trees and tree canopies that extend over the street are associated with fewer crashes.

When assessing the safety impact of street trees, we encourage planning agencies to be cognizant of context and the potential influence of street design on road user behaviors such as speed.



Planimetric roofprint data ensures safer and more cost-effective floodplain management for your community

Article submitted by Ryan Huffman, geographic information systems/database systems analyst at Arapahoe County. Ryan can be reached at 720-874-6685 or rhuffman@arapahoegov.com.

DRCOG's planimetric building roofprint data is helping Arapahoe County more efficiently increase community floodplain safety and decrease flood insurance costs for its residents. The planimetric data has been a powerful resource for the county's participation in Community Rating System (CRS). CRS is a voluntary program administered by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program (NFIP). CRS rewards communities for engaging in activities that reduce flood risk

with discounts on flood insurance premiums. Each CRS activity earns the community points – the more points, the larger the discount on flood insurance for the community.

Numerous DRCOG member governments already participate in CRS, but might not be aware how DRCOG’s planimetric roofprint data can help. **Specifically, roofprint data provides a creditable, existing resource in performing spatial analysis on, and reporting of, insurable structures that fall or no longer fall within continuously changing FEMA and other regulated floodplains. CRS requires such activity as part of its initial and annual recertification reporting process.**

Before using planimetric roofprint data it would take Arapahoe County and the Southeast Metro Stormwater Authority staff weeks to visually inspect imagery and digitalize new structure roofprints. With the planimetric data resource, the county and authority have been able to reduce staff effort on the project to just a few days.

Arapahoe County appreciates the hard work and collaborative efforts of DRCOG and its participating partners to make planimetric features, especially roofprints, possible. Andy Kuster, GIS manager at Southeast Metro Stormwater Authority and Candida Velasquez, GIS technician at Arapahoe County deserve recognition for their continuing contributions to Arapahoe County’s CRS recertification efforts.

COMMUNITY RATING SYSTEM ANNUAL RECERTIFICATION

CRS Program Data Table	A. In the SFHA	B. In a regulated floodplain outside the SFHA
1. Last report’s number of buildings in the SFHA (bSF) (line 6, last report)		
2. Number of new buildings constructed since last report	+	
3. Number of buildings removed/demolished since last report	-	
4. Number of buildings affected by map revisions since last report (+ or -)		
5. Number of buildings affected by corporate limits changes (+ or -)		
6. Current total number of buildings in the SFHA (bSF) (total lines 1–5)		

Join the 2018 planimetric data project

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

The region's 2018 [Denver Regional Aerial Photography Project](#) is off to a great start. All spring flights in the Front Range have already been completed. Final, orthorectified imagery will be delivered in December, at which point a **planimetric update** project can begin. To help all potential partners budget accurately and have time to consider their needs and wants, DRCOG is starting to plan now.

DRCOG is already engaging with existing planimetric project partners to get a better understanding of requirements for the upcoming project. We have a rough estimate of costs and are ready to provide quotes to interested entities.

If you are not an existing planimetric project partner but you want to be involved in our upcoming project, please reach out to me at asummers@drcog.org. By participating, you can influence how the project is conducted, the features to be collected and how they are captured and attributed. In addition to being able to tailor the project to your needs, your participation helps the wider GIS community in our region. Our strong partnerships allow us to leverage our modest budgets into quality data sets that power our distinct business needs. Please join us in this [significant regional effort](#).

Download 2014 and 2016 building roofprints, edge of pavement, parking lots, sidewalk centerlines and more for free from our [Regional Data Catalog](#).

More cities and counties provide open data

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

For many years, DRCOG has compiled local data sets into regional data sets in support of analysis, modeling and measurement. DRCOG's processes have addressed not only the complexity of standardizing disparate content, but also the data-sharing restrictions imposed by each local source. In response, DRCOG built the Data Portal in 2014, an application that collects data-sharing restriction information with each submitted layer. The application helped DRCOG

understand how to protect data according to our member governments' wishes.

This year, DRCOG staff noticed a decline in use of the Data Portal. This is great news! The reason for the decline, at least in part, is because more local governments are sharing their data on their websites for free public download. The increase in local open data sites has been astounding, going from just a handful last year to 20 sites this year.

DRCOG applauds these efforts for their positive effect on our communities by equipping residents, neighbors and partner agencies with data and information.

To peruse local data, check out these open data sites:

[Adams County](#)

[Arapahoe County](#)

[Arvada](#)

[Aurora](#)

[City of Boulder](#)

[Boulder County](#)

[Brighton](#)

[Broomfield](#)

[Castle Rock](#)

[Centennial](#)

[Commerce City](#) **Just launched!**

[Denver](#)

[Douglas County](#)

[Erie](#)

[Gilpin County](#)

[Greenwood Village](#)

[Jefferson County](#)

[Lone Tree](#)

[Weld County](#)

[Westminster](#)

For regional data sets, visit [DRCOG's Regional Data Catalog](#).

Regional Data Catalog includes

housing aggregates

*Article submitted by Dorothy Friday, GIS specialist at DRCOG.
Dorothy can be reached at 303-480-6797 or
dfriday@drcog.org.*

Planning applications at DRCOG use a geospatial inventory of individual housing unit locations to model current and future development and travel patterns. High-quality housing data improves regional models and contributes to an in-depth understanding of regional growth and behavior. It helps economists and planners predict housing availability, measure open space and improve transportation infrastructure.

Individual housing unit counts are derived from DRCOG's annual collection of county parcels, municipality land use layers, address points and planimetric building data. DRCOG supplements local data with data from InfoGroup, CoStar and University of Colorado Denver. The Area Agency on Aging also provides information on the location and unit count of assisted living facilities in the region.

The data is point-level for internal use. DRCOG now provides aggregations of the internal housing data set by city and county.

DRCOG has maintained the regional housing data set since 2014. The accuracy of housing aggregations varies by location and year. Over time, aggregations of point-level housing data are influenced by factors such as changes in municipal boundaries, changes in available source data and on-the-ground construction. For example, DRCOG planimetric data was not incorporated into the housing data set until the 2016 modeling year, and it revealed several hundred missed housing units in some smaller towns.

Despite inevitable imperfections, the DRCOG housing data set aligns well with other authoritative sources (like the U.S. Census Bureau) and provides valuable insight for research.

Download data from the [Regional Data Catalog](#).

DRDC workshop survey results

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

In the January newsletter, DRCOG invited data consortium members to provide feedback on the topics and technologies that DRCOG should consider featuring during a technical workshop. In a survey last summer, members indicated that workshops would be a beneficial addition to the consortium's current offerings, which include quarterly newsletters and meetings.

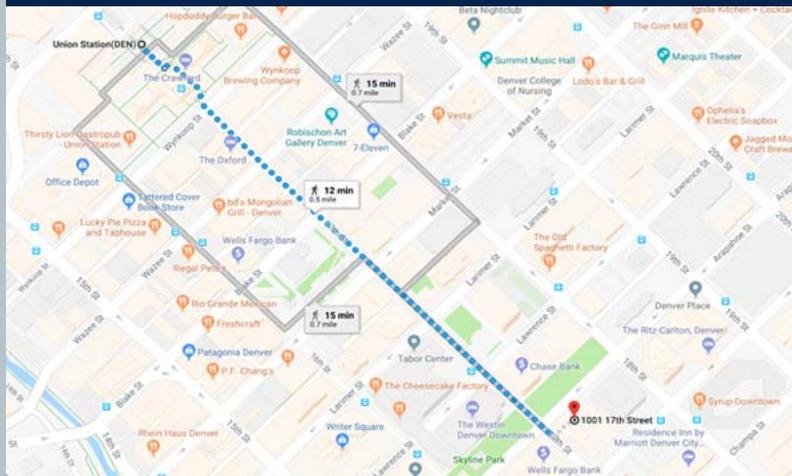
Response the workshop survey was low, with only six people providing feedback. Respondents ranked processing data with open source tools, web-mapping, ArcGIS Pro, QGIS and Python among their top choices for a technical workshop.

Esri hosted a training session on ArcGIS Pro for attendees of our spring DRDC meeting. [Watch the webinar](#). Please also see the latest [ArcGIS Pro Training Guide](#).

FYI: DRCOG is moving!

In June, DRCOG will move from 1290 Broadway to **1001 17th Street**. Please pay close attention to upcoming meeting invites so you join us at the correct location.

The new offices are a short walk from Union Station. We'll also be closer to popular happy hour spots — an opportunity on which we will capitalize after our summer DRDC meeting. Watch your email for more information.



Pop quiz

The [Regional Traffic Counts](#) map provides all-day, total traffic volume data for the period of:

- a) 2011-2016
- b) 2010-2016
- c) 2009-2016
- d) 2008-2016

[Respond to Christine Connally](#) with your answer. The first to get it right earns a free beer (or beverage of your choice) at our next happy hour event following the summer DRDC meeting.

Engage with us

- The new version of our Regional Data Catalog launched in January. We invite you to visit the site and give us some feedback in this [brief survey](#).
- This quarterly newsletter reaches more than 300 people, has a higher-than-average open rate and is written by professionals like you. It's the perfect place to show off your projects, highlight your great work and contribute ideas to the GIS community in the Denver region. Newsletter release dates are Jan. 15, April 15, July 15 and Oct. 15 (or the next business day afterward). Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.
- Did you miss a newsletter or a meeting? [Visit our website](#) for past newsletter issues and DRDC meeting materials.

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org.

Disclaimer: The information provided in this newsletter is compiled from multiple sources and is intended for informational purposes only. DRCOG assumes no responsibility or legal liability for the accuracy, completeness or usefulness of any information in this newsletter.



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Introducing the new Regional Data Catalog

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

DRCOG has been hosting a Regional Data Catalog since around 2010. Since the beginning, our goal has been to provide easy access to regional data for our varied audience that includes GIS professionals and planners within local governments, at our partner agencies, at academic institutions, in the private sector and the general public. To continue achieving this goal, DRCOG staff knows it must keep up with ever-changing technologies and the needs of our stakeholders.

For the past six months, DRCOG information systems staff have been working on a new version of our Regional Data Catalog. We aimed to improve discovery of data and maps by:

- categorizing information in an intuitive way
- standardizing naming conventions and keywords

- employing more flexible search methods
- allowing users to sort and filter results by topic, date and format
- advertising new additions and popular downloads
- providing more formats, including GeoJSON, WMS, KML and SHPs
- adding webmaps to a map gallery

[Regional Data Catalog](#)

If you have feedback for us, please [take the survey](#).

Workshop survey: Tell us what you want to learn

At the fall 2017 Denver Regional Data Consortium meeting, attendees suggested that DRCOG offer technical workshops. We are happy to offer assistance and excited to share our skills with you. We're also interested in the possibility of co-teaching with those of you who would like to collaborate on a class.

Whether you want to learn or teach with us, please let us know what topics, technologies and DRCOG initiatives interest you most. We want to ensure that our 2018 offerings meet your needs.

[Take the survey](#)

Modernized National Spatial Reference System will bring about 3 feet of change

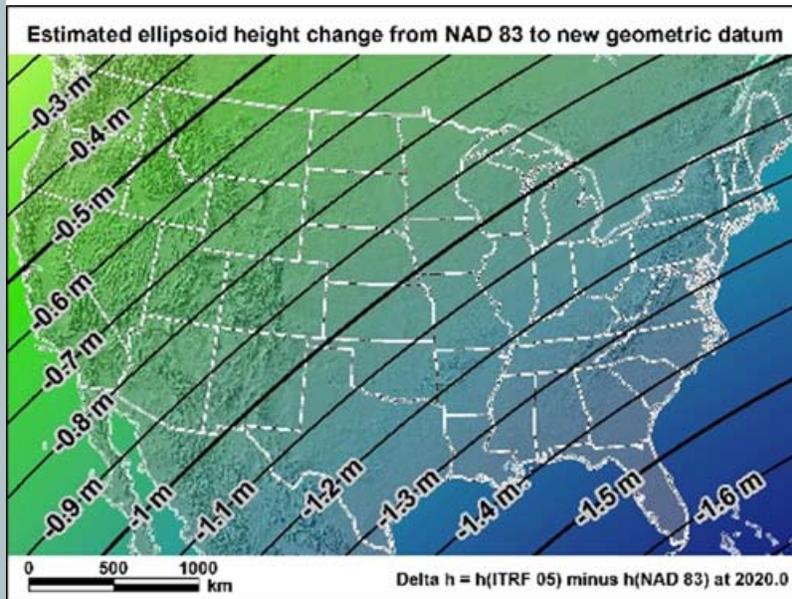
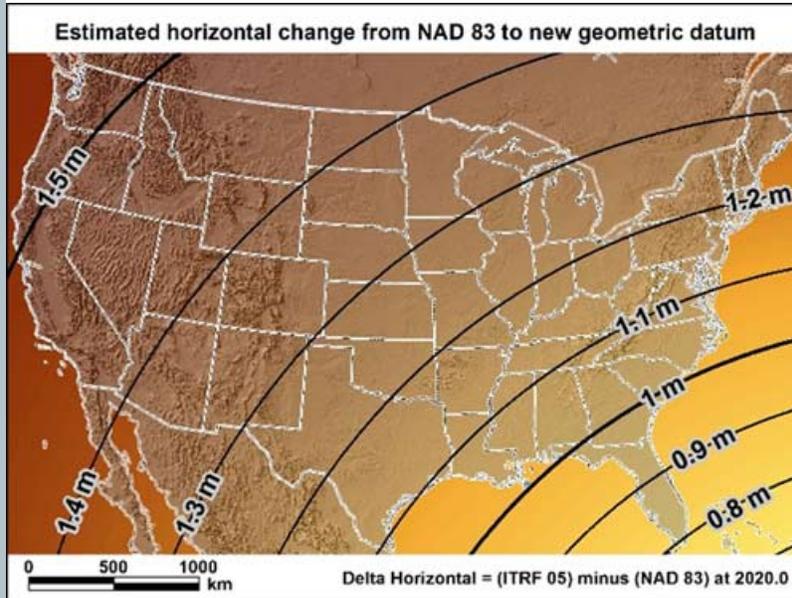
Article submitted by Pam Fromhertz, Rocky Mountain regional adviser at the National Geodetic Survey, National Oceanic and Atmospheric Administration. Pam can be reached at 240-988-6363 or pamela.fromhertz@noaa.gov.

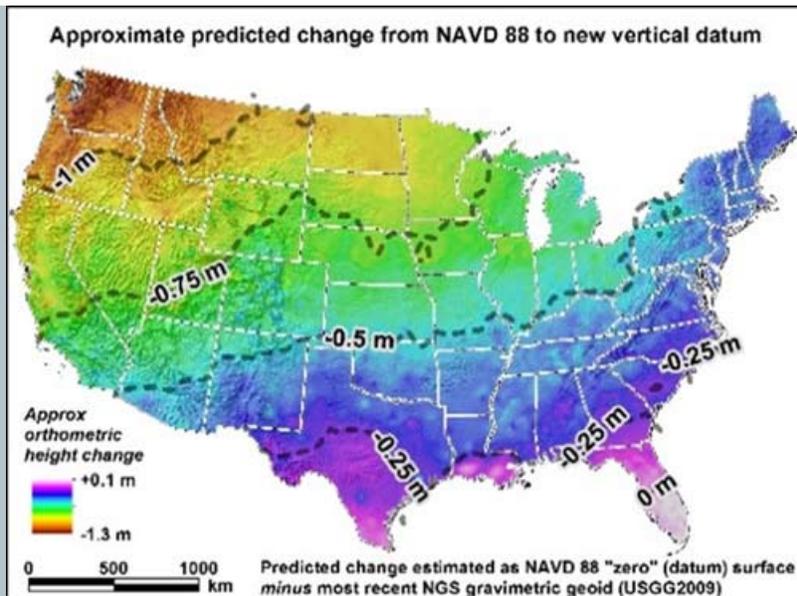
All geospatial data is defined by some type of reference frame or datum. The National Geodetic Survey (NGS) defines, maintains and provides access to the coordinate system and vertical datum for the United States, known as the National Spatial Reference System. As technology, mainly Global Navigation Satellite Systems (GNSS), is increasingly integrated into data collection, the method by which these surfaces are defined must be updated to meet users' needs. Just 30 years ago, nationwide horizontal and vertical datums were only accurate to several feet. Today, many users want to know where they are located to within a few inches and thus NGS is in the process of improving these reference systems.

New reference system

There are currently two datums: a horizontal datum, North American Datum of 1983 (NAD 83), and a vertical datum, North American Vertical Datum of 1988 (NAVD 88). Ashley wrote about the horizontal datums in the [October 2013 DRCOG Data Consortium Newsletter](#). Prior to GNSS, the survey techniques and data used to define the horizontal datums were completely independent of the vertical. Now with the advent of GNSS we get 3-D data instantaneously, and even 4-D if time is taken into account. The vertical component from GNSS is referred to as an ellipsoid height. However, that height is based merely on a mathematically defined ellipsoid so it provides minimal information about the topographic heights that conform to gravity, and which way water flows or floods. Traditionally, we use orthometric heights derived from a simple surveying technique called differential leveling. This orthometric height gives us a height relative to a standard datum surface that is roughly equivalent to mean sea level. Leveling is, however, very laborious and costly. To provide improved GNSS access to meet users' needs, NGS is re-inventing the entire National Spatial Reference System. NGS will release a new system in 2022, with two principal components: a semi-dynamic 3-D geometric reference frame, called the **North American Terrestrial Reference Frame of 2022 (NATRF2022)**, along with similar frames for the Pacific, Marina and Caribbean plates; and a nationwide geopotential datum defined by a gravimetric geoid (a surface that approximates an idealized mean sea surface), called the **North American-Pacific Geopotential Datum of 2022** or **NAPGD2022**. Changes in

published positional values in Colorado are anticipated to be on average three feet horizontally and vertically in Colorado.





Note the two images illustrating the anticipated changes: One uses the ellipsoid height and the other the orthometric height. Keep in mind the difference between orthometric and ellipsoid height in Colorado is an average of 60 feet.

Anticipated positional changes in 2022 computed for Station W 409 near Denver

Horizontal: 1.4 meters (4.6 feet)

Ellipsoid height: -0.9 meters (-2.9 feet)

Orthometric height: -0.7 meters (-2.3 feet)

NGS intends to provide a geoid model that is accurate to within 2 centimeters (0.8 inches) for GNSS-based access to orthometric heights without leveling. In other words, you will be able to apply the geoid model accurately to your GNSS data to derive the needed height or elevation. NGS has held many workshops on the development and effects of the new reference system. Visit [National Geodetic Survey: New Datums](#) for presentations, recordings and documents. With the release of the modernized reference system in 2022, technical reports and conversion software will be available. NGS Coordinate and Transformation Tool (NCAT) is available in beta version for transforming between all horizontal datums as well as converting between various systems. I will present on this topic at the [Elevations Geospatial Conference](#) and the [Rocky Mountain Survey Summit](#).

policy for GIS data and standard maps

Article submitted by Barbara Morey, CP, GISP, lead geographic information systems analyst/developer at Jefferson County Information Technology Services. Barb can be reached at 303-271-8041 or bmorey@jeffco.us

Jefferson County has long had a policy of charging a fee for GIS data and maps. The Board of County Commissioners voted unanimously to rescind that policy effective Jan. 10, 2017 – approximately one year ago. The county continues to charge a fee for custom GIS processing, analysis, maps and parcel data.

Though a fee is no longer charged, the county still required a signed license agreement. This meant staff continued to be involved in each request, which kept the process of distributing data slow. The Information Technology Services geographic information systems staff worked with the county attorney on the licensing details and ultimately received permission to adopt a Creative Commons license. Because the Esri Open Data site uses Creative Commons licensing, Jefferson County could distribute data using ArcGIS Open Data.

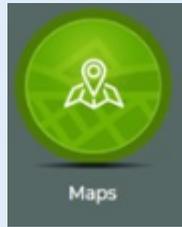
In June 2017 Jefferson County made available 29 GIS data sets on the site and ceased other distribution methods for non-fee data. The data available via ArcGIS Open Data includes the most-requested items from Address points to Zoning. See the complete list at the end of this article. The standard maps, in PDF format, are available free of charge on the county website.

The GIS data is also available to view, search for property or permits, identify layers, and to print at the [Jefferson County online map, “jMap”](#)

To access the data available to download, go to Jefferson County page on the [ArcGIS Open Data site](#).

To download the standard maps, in PDF format, go to the [county website](#) and select the green “Maps” icon.

Data available for download:



- Address
- Ambulance District
- Bike Plan
- Colorado state house district
- Colorado state senate district
- Colorado U.S. house district
- City boundary
- City precinct

- City ward
- Commissioner district
- County boundary
- County precinct
- Fire bond district
- Fire district
- Foothill park and rec
- Improvement district
- Metropolitan district
- Open space parks
- Open space trails
- Park district

- Regional Transportation District
- Sanitation district
- South Jeffco local improvement district
- Streets
- Traffic impact fee area
- Urban renewal district
- Water district
- Water and sanitation district
- Zoning

Recap of the LUCA technical

workshop

The U.S. Census Bureau held a technical workshop for the Local Update of Census Addresses at DRCOG on Dec. 12.

LUCA is the only opportunity offered to tribal, state and local governments to review and comment on the U.S. Census Bureau's residential address list for their jurisdiction prior to the 2020 Census. The program for the 2020 Census was introduced in January of 2017. Registration for the program began in July and ended Dec. 17, 2017.

The technical workshop was designed for local address coordinators, GIS practitioners or local planners to help them understand the LUCA process and their participation in the program.

If you missed it, you can watch the [recorded webinar](#) and [view the slides](#).

For more general information on the U.S. Census Bureau, attend upcoming virtual trainings entitled [Your Community by The Numbers](#).

Join the 2018 planimetric project

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

DRCOG and its partners have just successfully finished the second regional planimetric project! Our first project collected features from 2014 aerial imagery and the second recorded changes seen in 2016 imagery. Both sets of data include building roofprints, edge of pavement, parking lots, sidewalk centerlines and more, and are available for [free download from our Regional Data Catalog](#). We invite you to take a look and put the data to good use!

With projects as large as these – covering so much area and including so many small details – there's never really much time to rest on our laurels. As soon as we've finished one project successfully, we're already on to the next one. That's where you come in.

Our 2018 Denver Regional Aerial Photography Project is gearing up and planes are expected to be in the air by March. Final, orthorectified imagery will be delivered to us in December, at which point a planimetric update project can begin. To help all potential partners budget accurately and have time to consider their specific needs and wants, DRCOG is starting to plan now.

DRCOG is already engaging existing planimetric project partners in surveys to get a better understanding of requirements for the upcoming project. During the first quarter of this year, we will determine our parameters and get rough cost estimates to equip our partners for 2019 budget discussions.

If you are not an existing planimetric project partner but you want to be involved in our upcoming project, please reach out to me at asummers@drcog.org. By participating, you can influence how the project is conducted, the features to be collected and how they are captured and attributed. In addition to being able to tailor the project to your needs, your participation helps the wider GIS community in our region. Our strong partnerships allow us to leverage our modest budgets into quality data sets that power our distinct business needs. Please join us in this significant regional effort.

RTD releases 2017 customer satisfaction survey results

In case you missed it, [read the press release](#).

Your article goes here!

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Newsletter release dates are Jan. 15, April 15, July 15, and Oct. 15 (or the next business day). Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

Pop quiz: Can you answer these questions about the region?

Which county has the highest median home value?

- a) Arapahoe
- b) Boulder
- c) Denver
- d) Douglas

Which county had the largest percent of people older than 60 in 2016?

- a) Boulder
- b) Clear Creek
- c) Gilpin
- d) Jefferson

Hint: Use [DRCOG's Community Profiles](#). We've updated them since the last newsletter with the latest American Community Survey data!

If you know the answer, [respond to Christine Connally](#). The first to respond with the correct answer will be recognized in the next newsletter.

Congratulations to the winner from the last newsletter:

Rachel Parinello - Boulder

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org.

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DRDC survey results

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

Over the summer, DRCOG conducted a survey of the Denver Regional Data Consortium to better understand how we can serve you through collaborative projects, meetings and newsletters.

Here are some highlights:

- DRCOG's most important data consortium role – and one for which we are uniquely qualified – is facilitating projects to acquire data. Among respondents, 74 to 79 percent rated DRCOG facilitation of the Denver Regional Aerial Photography Project, planimetrics and LIDAR as “very valuable.”
- The majority of respondents are “very satisfied” with the frequency and length of our meetings and newsletters, but only “mostly satisfied” with content. More member content, as opposed to DRCOG content, is a suggested as an improvement, but 78 percent of survey-takers said they would prefer not to contribute.

- 68 percent voted to allow vendors to present at meetings if they didn't give a sales pitch.
- 90 percent voted for DRCOG to continue offering remote attendance options (but 68 percent said remote participation decreases collaboration).
- 63 percent voted for DRCOG to facilitate other types of networking and collaboration opportunities.

Based on the results, DRCOG has developed the following plans for improvement:

- a new way to submit articles: Let us interview you and we'll write the article!
- a new newsletter section: "Meet a local government GIS department."
- a new 2018 meeting schedule to accommodate socializing and encourage in-person attendance
 - spring meeting: 11:30 a.m. to 1:30 p.m. with catered lunch (and a potential vendor presentation)
 - summer meeting: 3 to 5 p.m., followed by happy hour
 - fall meeting: 10 a.m. to noon, followed by a technical workshop
- a new data pursuit: routable street centerlines

Join us for our [next meeting Nov. 9](#) to learn more.

Note: Results are from 19 respondents out of 252 survey recipients.

Denver Water landscape classification project

Article submitted by Robert Stansauk, GIS supervisor, and Phillip Segura, division senior analyst, at Denver Water. Robert and Phillip can be reached at robert.stansauk@denverwater.org or phillip.segura@denverwater.org.

Background

Roughly 40 percent of the water Denver Water treats is used outdoors (irrigation, for example). We have the data necessary for accurate billing based on our rate structures. However, when it comes to better understanding water use behavior we have lacked information about landscape

preferences and trends which have a huge effect on decision-making. The landscape classification project provides robust data to aid in the decision-making and planning processes by many of our groups.

At a high level, this data allows us to understand trends in water use and prepare for factors which will have a major effect on our system such as climate change and population growth. Denver Water can now understand the unique characteristics that affect water use for the individual customer, giving us the ability to help them use water efficiently.

Specifically, this data helps:

- our Conservation group measure water use efficiency
- our Demand Planning group understand customer water use and how it could change in the future, which in turn helps with facility sizing requirements
- our drought response by knowing which customers may be able to achieve reductions
- us understand water reuse based on water rights
- us evaluate customer response to potential rate changes (for example, affordability)

Process

We began by using the 2014 Denver Regional Aerial Photography Project imagery and 2014 planimetric data. We use Earth Resources Data Analysis System (ERDAS) Imagine and ERDAS Objective to classify the imagery by neighborhood (one neighborhood at a time). We use Esri for most of the pre- and post-processing. To date we have completed north and south Park Hill.

The general workflow is:

1. pre-processing
 - select and merge planimetric features by neighborhood
 - create image mosaics
 - create classification .aoi files for ERDAS
2. classification
 - use ERDAS Objective to classify individual layers (vegetation, shadows, turf, concrete, alternative and unclassified impervious)

3. post-processing

- perform quality assurance on each layer
- merge all layers into a topologically clean vector layer

Results

North Park Hill 2014

(percentages for whole neighborhood)

-  Planimetric (47%) - Edge of pavement (roads), parking lots, sidewalks, driveways, rooftops
-  Vegetation 1 (2%) - Green plants at time of imagery (spring). Mostly coniferous. Includes shrubs, hedges, other plants, and clusters of bare branches.
-  Shadows (10%) - Shadows at day/time imagery was taken.
-  Vegetation 2 (8%) - Plants and trees with leaf off at time of imagery. Mostly deciduous. This represents the minimum number for the neighborhood.
-  Turf (23%) - Turf in early spring can be green, brown, or patchy.
-  Concrete (2%) - Includes colored concrete, asphalt, brick, stone paths and patios. There is no way to prevent some overlap with the Alternative layer (i.e. decorative rock).
-  Alternative (3%) - Includes mulch, decorative rock patches, dirt. There is no way to prevent some overlap with the concrete layer (i.e. decorative rock).
-  Unclassified (5%) - "everything else" examples include, junk piles, cars, tarps, play toys, etc. Usually the feature(s) captured are on top of a pervious surface.



Summary

Several enabling components came together simultaneously to make this project possible, including 1) DRAPP imagery 2) DRCOG planimetric data 3) a customer focus in our strategic plan and 4) a new model for tracking customer characteristics developed in our Conservation section.

There were also two important keys to our success. First, ERDAS Objective was the right tool for us. It classifies the

image by emulating the human visual system for image interpretation. It uses machine learning and interpretation cues (for example, shape, size, spectral, texture and associations) – not to mention all the other functionality that comes with ERDAS Imagine. The second key is the quality assurance process. The layers we are creating have similar and overlapping spectral signatures (for example, sometimes old mulch can look like dead grass, or a concrete patio might be stained with a natural color that looks like some variation of dirt). These characteristics make it necessary for Denver Water staff to review and edit the results.

Register for LUCA and attend a technical workshop

The U.S. Census Bureau will hold a technical workshop for the Local Update of Census Addresses at DRCOG the morning of Dec. 12.

LUCA is the only opportunity offered to tribal, state and local governments to review and comment on the U.S. Census Bureau's residential address list for their jurisdiction prior to the 2020 census. The program for the 2020 census was introduced in January 2017. Registration for the LUCA program began in July and ends Dec. 17.

The technical workshop is designed to help local address coordinators, GIS practitioners and local planners understand the LUCA process and how they will participate in the program.

Census staff will discuss and demonstrate:

- LUCA program timeline
- participation options
- LUCA data format
- use of the U.S. Census Bureau's Geographic Update Partnership Software (GUPS) based on QGIS
- use of ArcGIS and Microsoft Excel

Participants can expect a detailed view of the process including a technical discussion on address lists and GIS data processing. Participants will spend several hours reviewing sample data using live software and discuss the U.S. Census

Bureau's geocoding tool as part of the process. While not required, attendees may bring their own laptop, ArcGIS, Microsoft Excel and local address list to explore LUCA processing options. Presenters will demonstrate a prototype but are unable to distribute the U.S. Census Bureau's GUPS tool.

Preregistration is required.

[REGISTER](#)

Turning 'dead end' sign asset data into an asset inventory

Article submitted by Ryan Huffman, geographic information systems/database systems analyst at Arapahoe County. Ryan can be reached at 720-874-6685 or RHuffman@arapahoegov.com.

Arapahoe County's Road and Bridge Division was recently in a tough situation. We were faced with a shrinking budget, aging sign assets and a pressing federally mandated deadline for sign retroreflectivity compliance.

We desperately needed to collect data on the county's solid inventory and develop a sustainable way to keep it current. The next step was to use the collected data to accurately budget for and plan sign and post replacement.

The resulting project involved a great deal of staff collaboration and included technical innovation. Such innovations included barcoding all signs using rugged tablets with sufficient GPS receivers. Staff coupled a robust mobile software package with web map services to handle complexities in robust data attribution and offline mapping.

In 2017 we passed an important milestone: 13,547 sign and 5,746 signpost active asset data records were brought online within the asset management system. As a result, the Road and Bridge Division was able to better understand the type and location of assets. Further analysis of the data allowed county staff to achieve compliance and better allocate their budget. Most importantly, Arapahoe Country made

improvements and ensured the safety of its roadways. The project involved considerable collaborative effort, and has set the standard for future endeavors.



DRCOG performs economic analysis for City of Golden

Article submitted by Xavier Gitiaux, economist at DRCOG. Xavier can be reached at 303-480-5642 or xgitiaux@drcog.org.

DRCOG's Regional Planning and Development team recently conducted a pilot to tailor data analysis to the needs of local governments. The pilot supports investment decisions in smaller communities by reviewing data within the local context and comparing macroeconomic trends and local opportunities.

Regional Planning and Development staff applied the concept to the City of Golden in partnership with its Downtown Development Authority. Robin Fleischmann, redevelopment specialist for downtown Golden, explained that "the City of Golden wanted to tailor its economic development strategy for the local business community and the generally available employment and wage data was not specific enough for that purpose. Knowing that it has economists on staff, Golden approached DRCOG for help."

Using the Longitudinal Employer-Household Dynamics data, the American Community Survey and the American Community Survey Public Use Microdata Sample, the Regional Planning and Development team discovered that manufacturing, although shrinking, remains the leading employment sector in Golden. But the team discovered most current economic growth is fueled by the professional and technical services and leisure and accommodation sectors. The analysis highlighted the extent to which Golden's

employment market relies on commuters from east Denver, Lakewood, Wheat Ridge and Arvada, and how current constraints on the housing market in Golden might limit future job growth. Fleischmann finds this information useful “to refine local economic development policy and incentives including tax increment financing, business grants and community partnering.”

Regional Planning and Development staff will expand the pilot to other small communities since the effort aligns with DRCOG’s objective to inform local strategies with data and make connections among local contexts and regional economic and demographic trends.

Join the 2018 Denver Regional Aerial Photography Project

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

After much coordination and planning, the specifications for the 2018 Denver Regional Aerial Photography Project (DRAPP) are final. The upcoming project – to be flown in the spring and summer of 2018 – will include **double the amount of 3-inch resolution imagery** in the metro area’s urban core. In addition, the project will produce the same high-quality deliverables of past projects that are snow- and leaf-free, minimize building lean and shadows, and meet industry standards for positional accuracy. [Read more in our handout.](#)

There is still time to become a DRAPP 2018 project partner. If you represent a public entity interested in the project, contact Ashley at 303-480-6746 or asummers@drcog.org for a quote.

Contributing 600,000-plus
building roofprints to
OpenStreetMap

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

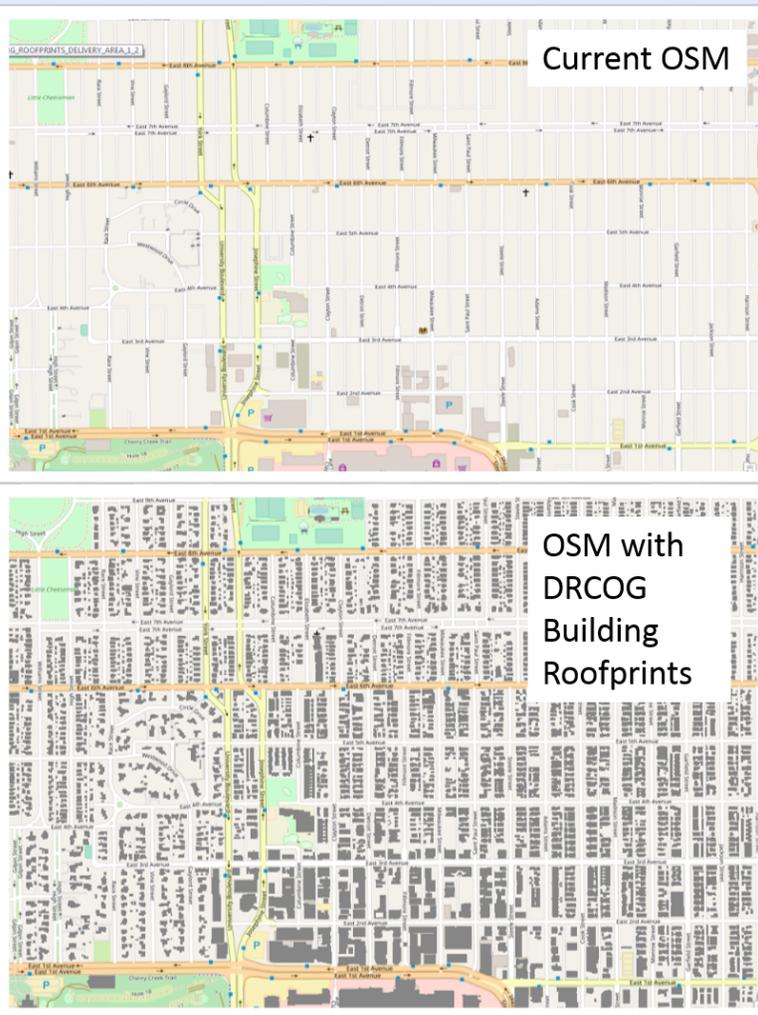
DRCOG, on behalf of 21 partners in the region, completed the Denver metro area's first-ever regional planimetric project in June 2016 (based on 2014 aerial imagery). The contributing partners agreed to publish data immediately in the public domain, so DRCOG made it available for free download from the Regional Data Catalog.

To maximize the usefulness of this detailed data, the DRCOG team also decided to provide the data to OpenStreetMap (OSM). Although we have several planimetric features, we decided to start with contributing **more than 600,000 building roofprints** in the Denver metro region. DRCOG reached out local OSM volunteers for guidance on making planimetric features available. Over the next year, we documented our plan, prepared our data for import and finalized licensing language consistent with the OSM model.

An important consideration was that bulk imports into OSM are not preferred, as they might overwrite previously contributed data. To ensure that existing data was preserved, we determined that our data would need to be checked in by volunteers instead of uploaded all at once. OSM volunteers spent a considerable amount of time configuring a Tasking Manager that divides the data into chunks that can be individually vetted and approved.

DRCOG and the OSM volunteers will discuss the project at the State of the Map Conference in mid-October.

Later in the year, we will host mapping parties to encourage communities to submit data. Stay tuned for an invite!



Your article goes here!

The Denver Regional Data Consortium newsletter is facilitated by DRCOG but written by GIS professionals like you. This quarterly newsletter reaches more than 200 people and has a higher-than-average open rate. It's the perfect place to show off your projects, highlight your great work and contribute ideas to the GIS community in the Denver region.

Newsletter release dates are Jan. 15, April 15, July 15, and Oct. 15 (or the next business day). Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

Things you might have missed

- DRCOG featured on the [Cesium blog](#)

- categorizing information in an intuitive way
- adding new data sets that are specific to DRCOG's areas of expertise
- standardizing naming conventions and keywords
- employing more flexible search methods
- allowing users to sort and filter results by topic, date, format
- advertising new additions and popular downloads
- adding web maps to the map gallery
- improving navigation between the Regional Data Catalog and other DRCOG web properties

Stay tuned for the new site soon.

Pop quiz: Can you answer this question about the region?

Which two cities have the largest combined population?

- a) Parker and Glendale
- b) Commerce City and Bennett
- c) Castle Rock and Mead

Hint: Use [DRCOG's Community Profiles](#).

If you know the answer, respond to Christine Connally at cconnally@drcog.org. The first to respond with the correct answer will be recognized in the next newsletter. Also, Ashley will treat you to a beer (or beverage of your choice) at our next happy hour. Good luck!

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org.

Disclaimer: The information provided in this newsletter is compiled from multiple sources and is intended for informational purposes only. DRCOG assumes no responsibility or legal liability for the accuracy, completeness or usefulness of any information in this newsletter.



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The data consortium consists of Denver Regional Council of Governments members and regional partners with an interest in geospatial data and collaboration. The data consortium newsletter improves communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

In this issue, July 2017

- [Take the Denver Regional Data Consortium survey](#)
- [Census technical workshop for Local Update of Census Addresses in October](#)
- [Update on the 2016 Planimetrics Project](#)
- [Update on the 2018 Denver Regional Aerial Photography Project](#)
- [Your article goes here!](#)
- [Things you might have missed](#)
- [New and updated resources in DRCOG's Regional Data Catalog](#)

Take the Denver Regional Data Consortium survey

We're so glad you're part of the Denver Regional Data Consortium community! Please take a moment to give DRCOG feedback on how to make DRDC even more valuable.



Results will be summarized in the fall newsletter.

Please note: Our next [DRDC meeting](#) is July 27 from 10 to 11:30 a.m. at DRCOG in the Independence Pass conference room.

Census technical workshop for Local Update of Census Addresses in October

The U.S. Census will hold a technical workshop for the Local Update of Census Addresses at DRCOG the morning of Oct. 11.

The [Local Update of Census Addresses](#) (LUCA) is the only opportunity offered to tribal, state, and local governments to review and comment on the U.S. Census Bureau's residential address list for their jurisdiction prior to the 2020 Census. The program for the 2020 Census was introduced in January of 2017. Registration for the program began in July and ends Dec. 17.

The technical workshop is designed for local address coordinators, GIS practitioners, or local planners to help them understand the LUCA process and how they will participate in the program. Workshop conveners will discuss and demonstrate:

- LUCA program timeline
- participation options
- LUCA data format
- use of the U.S. Census Bureau's Geographic Update Partnership Software (GUPS) based on QGIS
- use of ArcGIS and Microsoft Excel

Participants can expect a detailed view of the process with a technical discussion on address lists and GIS data processing. Workshop participants will spend several hours reviewing sample data using live software and discuss the Census Bureau's geocoding tool as part of the process. While not required, attendees may choose to bring their own laptop, ArcGIS, Microsoft Excel and local address list to explore LUCA processing options. Workshop conveners will demonstrate a prototype but are unable to distribute the U.S. Census Bureau's GUPS tool.

Pre-registration is required.



Update on the 2016 Planimetrics Project

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drco.org.

In our [January newsletter](#), we reported that DRCOG and several partners were attempting to perform an update of the 2014 planimetric data using 2016 DRAPP imagery but were unable to close the funding gap required. We are happy to say that more partners joined the project - for a total of 27 - and we are now underway creating a full update to our previous product.

The 2016 planimetric project is segmented into [14 groups](#) for processing and delivery. All areas are expected to be delivered by the end of 2017. Groups 1 and 2 are already [available for download from our Regional Data Catalog](#).



The 2014 data has proved useful for a variety of applications, including pedestrian-routing, building inventories, creating emergency response plans and sidewalk quality and availability studies. The 2016 data can help us evaluate change over time by enabling us to do such things as quantifying new impervious surface (above) or locating our recent infrastructure investments.

The image below compares new sidewalks built within (pink) and outside of (yellow) a transit-oriented development area (half-mile around a transit station).



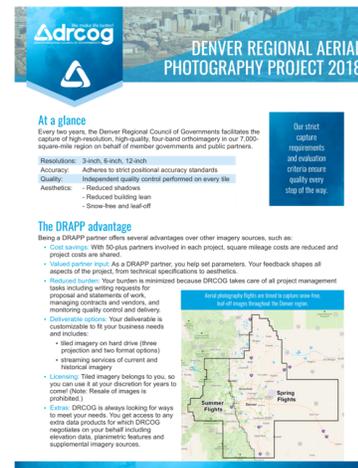
Stay tuned to our Regional Data Catalog as we expect to upload more data each month. If you find this data useful for your work, please consider sending us a summary of your analysis. Understanding how the community is using our data helps us continue to offer it for free.

Update on the 2018 Denver Regional Aerial Photography Project

DRAPP 2018 starts next spring but it's never too early to start planning! For those that haven't participated before, here's a quick summary of DRAPP: In the spring and summer of every even year, DRCOG facilitates a project to acquire high-resolution aerial imagery for our 7,000-square-mile region. The project takes two years to plan, execute, and deliver the imagery, but it's worth the wait. The resulting data is four-band, leaf-off, snow-free and follows [best-practice recommendations for positional accuracy standards](#) suggested by the American Society for Photogrammetry and Remote Sensing.

[Read more about the benefits of DRAPP.](#)

DRCOG held a kick-off meeting May 11. You can find the presentation and minutes on [our website](#). Following this meeting, past project partners received quotes to participate. If you did not receive a quote and want one, please email me at asummers@drcog.org. We will be signing up project partners from now until the end of the year - but sooner is better if you want input into the specs!



At a glance

Every two years, the Denver Regional Council of Governments facilitates the capture of high-resolution, high-quality, four-band orthorectified imagery in our 7,000-square-mile region on behalf of member governments and public partners.

Resolution: 3-inch, 6-inch, 12-inch
Accuracy: Adheres to strict positional accuracy standards
Quality: Independent quality control performed on every file
Aesthetics: - Reduced shadows
 - Reduced building lean
 - Snow-free and leaf-off

Our strict quality requirements and rigorous orthorectification ensure quality every step of the way.

The DRAPP advantage

Being a DRAPP partner offers several advantages over other imagery sources, such as:

- Cost savings:** With DRAPP partners involved in each project, square mileage costs are reduced and project costs are shared.
- Shared partner input:** As a DRAPP partner, you help set parameters. Your feedback shapes all aspects of the project, from technical specifications to aesthetics.
- Reduced burden:** Your burden is minimized because DRCOG takes care of all project management tasks including writing requests for proposal and statements of work, managing contracts and vendors, and monitoring quality control and delivery.
- Deliverable options:** Your deliverable is customizable to fit your business needs and includes:
 - Raw imagery on hard drive (three projection and two format options)
 - Streaming services of current and historical imagery
- Licensing:** That imagery belongs to you, so you can use it at your discretion for years to come (note: Resale of images is prohibited.)
- Custom:** DRCOG is always looking for ways to meet your needs. You get access to any area data products for which DRCOG regulates on your behalf including elevation data, payments features and supplemental imagery sources.

And don't forget! We have a quote for you. Get all of your imagery for the Denver area.

Summers Flight
Spring Flight

Your article goes **here!**

The Denver Regional Data Consortium newsletter is facilitated by DRCOG but written by GIS professionals like you. This quarterly newsletter reaches more than 200 people and has a higher-than-average open rate. It's the perfect place to show off your projects, highlight your great work and contribute ideas to the GIS community in the Denver region.

The newsletter is published Jan. 15, April 15, July 15 and Oct. 15 (or the next business day afterward). Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

Things you might have missed

- [Three teams win big - Go Code Colorado 2017](#)
- [Colorado Senate Bill 17-040 passes](#) (modifications to the Colorado Open Records Act regarding structured data)
- [Colorado GIS Summit 2017](#) (P.S. Subscribe to the Office of Information Technology's YouTube Channel.)
- [Walk and Talk with Colorado Chief Data Officer Jon Gottsegen](#)
- Join us at our next [Denver Regional Data Consortium meeting](#) on July 27

New and updated resources available in DRCOG's Regional Data Catalog

- [2015 ACS Five-Year Survey: Block Group Level Data, Colorado](#)
- [2015 ACS Five-Year Survey: Tract Level Data, Colorado](#)
- [2015 ACS Five-Year Survey: Place Level Data, Colorado](#)
- [2015 ACS Five-Year Survey: County Level Data, Colorado](#)
- [Assisted Living Facilities](#)
- [Denver Region Municipalities 2017](#) (map)
- [Municipal Boundaries 2017](#)
- [Nursing Homes](#)

- [Parks, Recreation and Open Space](#) (The new incarnation of our old "Open Space" layer. Read about the new schema in our [April newsletter](#).)
- [Parks, Recreation and Open Space 2015](#)
- [Parks, Recreation and Open Space 2014](#)
- [Participating Governments](#) (map)
- [Planimetrics 2016](#)
- [Rapid Transit System 2040](#)
- [Regional Traffic Counts](#)
- [Regional Zoning 2016](#) (map)
- [Regional Zoning 2016](#)
- [Schools Pre-kindergarten to College 2016](#)
- [Unincorporated Areas 2017](#)

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org

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Dear Colleagues,

Please join us on **Thursday, July 27** from 10 to 11:45 a.m. in the Independence Pass Conference Room at our office, 1290 Broadway, for the second data consortium meeting of 2017.

- [Agenda](#)

Can't attend in person? No problem! Join the meeting from your computer, tablet or smartphone.

1. Register for the webinar at <https://attendee.gotowebinar.com/register/5657599037014168066>
2. Use your microphone and speakers (VoIP) —a headset is recommended. You can also dial in using your phone.

United States: 1-415-655-0060
Access code: 232-739-431

If you have any questions, please contact DRCOG Information Systems Manager Ashley Summers, at 303-480-6746 or asummers@drcog.org.

Thanks,
Ashley

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AGENDA

10 to 11:45 a.m.
Thursday, July 27, 2017
Denver Regional Council of Governments
1290 Broadway, Denver, CO 80203
Independence Pass Conference Room (first floor, west side)

Parking recommendations [here](#)

Meeting Objective:

Promoting collaboration and information-sharing among GIS professionals in the region by featuring presentations and discussions led by members of the data consortium.

- | | |
|----------------------------|---|
| 10:00 to 10:05 a.m. | Introductions
Ashley Summers, DRCOG |
| 10:05 to 10:30 a.m. | Transitioning to ArcGIS Pro
Dave Vaillancourt, Esri |
| 10:30 to 10:50 a.m. | GIS Enterprise Upgrade
Doug Genzer and Bruce Reagan, City and County of Denver |
| 10:50 to 11:10 a.m. | Colorado Geoportal Project
Philip B. White, University of Colorado Boulder |
| 11:10 to 11:35 a.m. | Conference Recaps – ICACI and Esri UC
Christine Connally, DRCOG and Mike Garcia, Commerce City |
| 11:35 to 11:45 a.m. | Update on DRCOG Initiatives:
Planimetrics 2016
Denver Regional Aerial Photography Project 2018
Reimagined: Regional Data Catalog and Denver Regional Visual Resources |



The data consortium consists of Denver Regional Council of Governments members and regional partners with an interest in geospatial data and collaboration. The data consortium newsletter improves communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

In This Issue, April 2017

- [The U.S. Census Bureau's geocoding services](#)
- [DRCOG's new Parks, Recreation and Open Space layer](#)
- [Denver Regional Visual Resources news](#)
- [Denver Regional Aerial Photography Project 2018](#)
- [Governor's Office of Information Technology launches new website](#)
- [FYI on federal bills H.R. 482 and S.B. 103](#)
- [Go Code Colorado announces finalists](#)
- [Your Article Goes **Here!**](#)

The U.S. Census Bureau's geocoding services

Article submitted by Jim Castagneri, geographer at the U.S. Census Bureau. Jim can be reached at 720-962-3882 or james.d.castagneri@census.gov.

The U.S. Census Bureau has offered an online geocoding tool since 2014. Last summer the Census Bureau added an application program interface to provide additional functionality and customization for programmers. This service is intended for application developers who want to leverage the geocoding capability of the Topologically Integrated Geographic Encoding and Referencing (TIGER) system.

This service is designed for coding a provided address, or file of addresses, to a latitude/longitude coordinate based on data that has been loaded into the geocoding engine from a master address file/TIGER benchmark database. The optional inclusion of the geographic lookup (geoLookup) adds information to the result relating to various Census and political geographies that cover the latitude/longitude coordinate. GeoLookup results can also be obtained directly by searching on the latitude/longitude coordinates.

See the [U.S. Census geocoder](#) for full details.

U.S. Department of Commerce

United States Census Bureau

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FIND LOCATIONS USING...

- One Line
- Address
- Address Batch

FIND GEOGRAPHIES USING...

- One Line
- Address
- Address Batch
- Geographic Coordinates

ABOUT DATA...

- Benchmarks
- Vintages

▼ Welcome to Geocoder

Welcome to Geocoder

Census geocoder provides interactive & programmatic (REST) access to users interested in matching addresses to geographic locations and entities containing those addresses. Please see the Services API link below for more information.

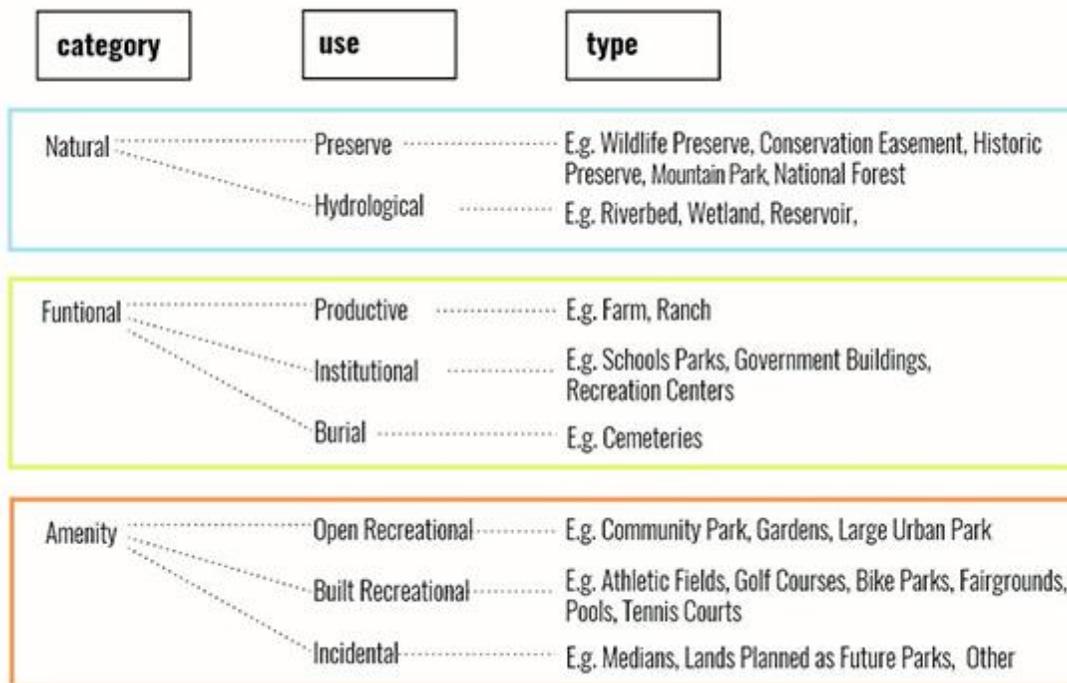
[Geocoding Services API PDF](#) | [HTML](#)

DRCOG's new Parks, Recreation and Open Space layer

Article submitted by Dorothy Friday, GIS specialist at DRCOG. Dorothy can be reached at 303-480-6797 or dfriday@drcoq.org.

DRCOG's Regional Planning and Development team has developed a new schema for the DRCOG Open Space dataset. Starting with the [existing dataset](#), the team redefined the attributes to differentiate between open space, athletic fields, preserved lands, recreation centers and many other land uses. The new schema is illustrated in detail below, and the data can be found and explored as the Parks, Recreation, and Open Space (PROS) dataset on the regional data catalog in May.

"The PROS dataset is local data, described and attributed to help with local planning and operations," said DRCOG planner Andy Taylor. "Adding the ability to differentiate among the features from these local datasets in a clear and consistent way helps us, and others, to ask regional and cross-jurisdictional questions and understand regional trends."



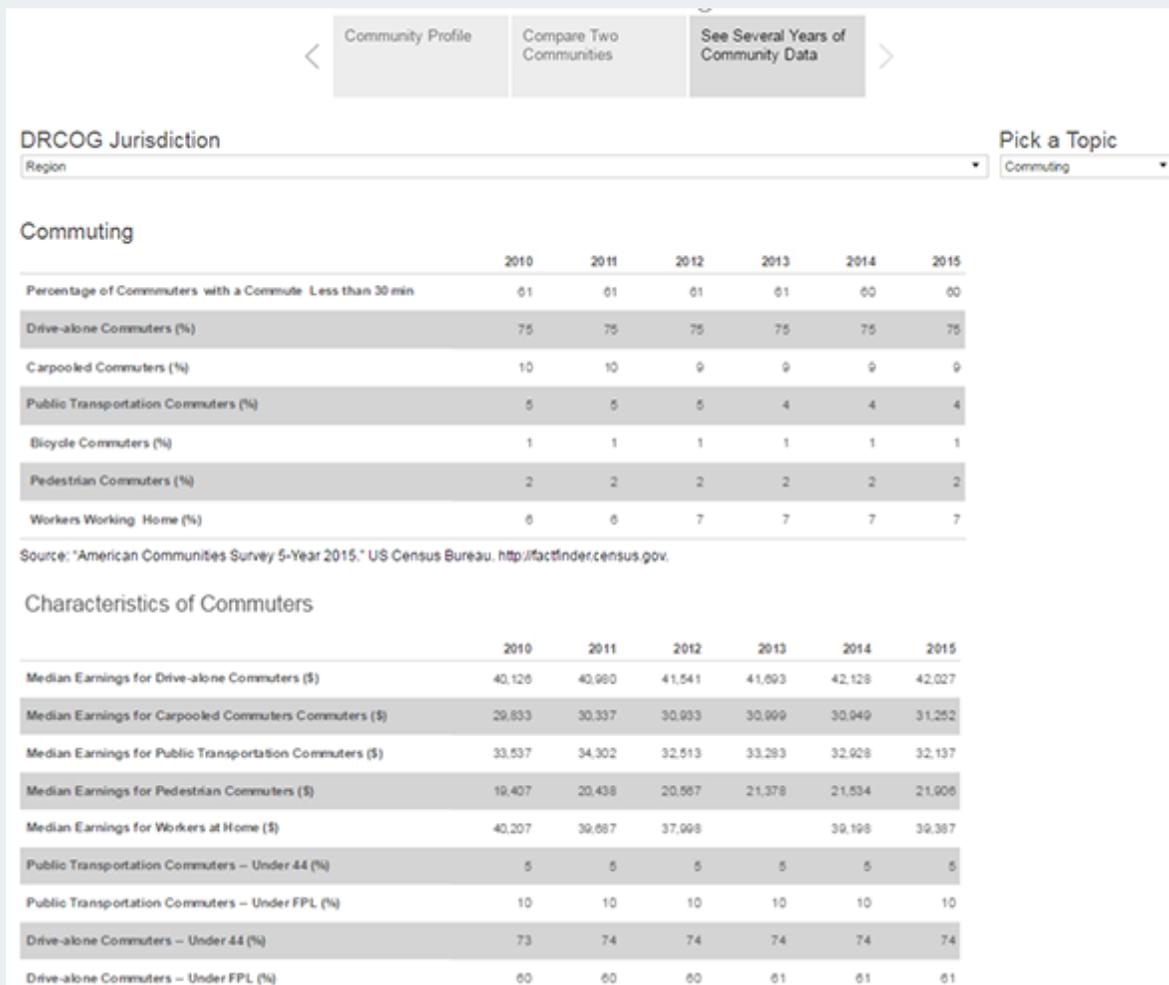
CITATION: (These categories were derived using guidance from Carys Swanick, Nigel Dunnet, and Helen Wooley's "Nature, Role and Value of Green Space in Towns and Cities: An Overview," *Built Environment*, 2003; and Donna Erickson's *Metro Green: Connecting Open Space in North American Cities*, 2006.)

Denver Regional Visual Resources news

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drco.org.

DRCOG launched the [Denver Regional Visual Resources \(DRVR\)](#) site in October 2015. This relatively new feature on our website is a repository of infographics, web maps and data stories that explain the state of our region in an interactive and dynamic way. We've been slowly refining the site and its visualizations to better suit your needs and have more changes planned. In the meantime, we have two news items to share with you.

1. Much to our surprise, *Westword* named DRVR the "[Best View of Denver by the Numbers](#)." We're proud to be recognized and excited about the opportunity to share our visualizations with a larger audience in our region.
2. We've recently updated our Community Profiles visualization. Now you can explore several years of U.S. Census data for a community. [Check it out!](#)



Denver Regional Aerial Photography Project 2018

The Denver Regional Aerial Photography Project (DRAPP) 2018 starts next spring but it's never too early to start planning! DRCOG is currently working with the DRAPP steering committee and 2016 partners to evaluate and adjust project parameters.

For those who haven't participated before, here's a quick summary of DRAPP. In the spring and summer of every even-numbered year, DRCOG facilitates a project to acquire high-resolution aerial imagery for our 7,000-square-mile region. The project takes two years to plan, execute and deliver the imagery, but it's worth the wait. The resulting data is four-band, leaf-off, snow-free and meets [strict positional accuracy standards](#) set by the American Society for Photogrammetry and Remote Sensing. Check out the [project extent](#) to see where we acquired 3-inch, 6-inch, and 1-foot resolution imagery. [Learn more about our 2016 project.](#)

If you've been a project partner in the past or want to be one for the 2018 project, please let me know. You are invited to a kick-off meeting on May 11; watch for an official invitation to be emailed soon. If you don't already receive DRAPP emails and you want to be on the distribution list, please email me at asummers@drcog.org.

For more information on DRAPP, [visit the DRCOG website.](#)

Governor's Office of Information Technology launches new website

Article submitted by Windy Fischer, senior GIS analyst at the Governor's Office of Information Technology. Windy can be reached at 303-764-6842 or

windy.fischer@state.co.us.

The GIS Coordination and Development Program of the Governor's Office for Information Technology (OIT) is pleased to announce the launch of its [new GIS website and data explorer](#). The GIS website helps users discover GIS data while also providing a place for state agencies, county and municipal partners, and other stakeholders to find GIS support. The site provides a menu of services including enterprise data sets, data management, web application development, hosting and business support services. The program's primary goals are to help Coloradans find GIS data and to reduce the cost and labor of duplicating data-related projects within local and state agencies.

Key features of the new site include:

- Products and services offered by the GIS Coordination and Development Program (GCDP)
- Quick access to GIS data and applications, including:
 - [Colorado Information Marketplace](#)
 - OIT GCDP enterprise datasets, services and a public geocoder
 - GIS Data Explorer showing local data available
 - Colorado Broadband Map
 - GCDP-hosted applications (for example the Trustlands GIS App for the Colorado State Land Board)
- The OIT GCDP events calendar to view details of upcoming and previous events, previous event media, and status of GCDP's enterprise datasets
- Ability for state agencies and stakeholders (municipalities, counties and partners) to request services



FYI on federal bills H.R. 482 and S.B. 103

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

[H.R. 482](#) and [S.B. 103](#) are federal companion bills that were introduced in mid-January and are currently referred to their respective financial services committees. The bills — both entitled "Local Zoning Decisions Protection Act of 2017" — begin with nullifying a [U.S. Department of Housing and Urban Development rule that was published in 2015](#).

Notable is Section 3 which states, "Notwithstanding any other provision of law, no federal funds may be used to design, build, maintain, utilize, or provide access to a federal database of geospatial information on community racial disparities or disparities in access to affordable housing."

Several organizations have voiced their opposition to these bills, including the [American Association of Geographers](#), the [National Low Income Housing Coalition](#) and [many more](#). There is also a [MoveOn.org petition](#) seeking signatures.

Go Code Colorado announces finalists

Article submitted by Andrew Cole. Andrew can be reached at 303-869-4908 or andrew.cole@sos.state.co.us.

On April 10, [Go Code Colorado announced 10 finalist teams](#) from Challenge Weekend, held in five cities across the state in early April.

Two teams from each of the five Challenge Weekend sites in Colorado Springs, Denver, Durango, Fort Collins and Grand Junction will next participate in Go Code Colorado's expenses-paid Mentorship Weekend.

Go Code Colorado, a program run by the Colorado Secretary of State, challenges entrepreneurs, software developers and innovators to build apps that deliver public data into the hands of business decision-makers.

"Each year, Go Code Colorado participation and enthusiasm increases across the state," said Wayne Williams, Colorado secretary of state. "The high-caliber app and business concepts created during challenge weekend will further encourage government entities of all sizes to make their data available to developers and entrepreneurs so its inherent value can be fully utilized."

More than 230 individuals participated in Challenge Weekend, building apps and business concepts with their teammates, coding and analyzing data. Finalist teams demonstrated ideas that demonstrated feasibility and attractiveness to the marketplace, used data to create value for business decision-makers, and set new standards in innovation for Colorado businesses.

Finalists within the Denver region were [iversity](#), a hiring tool to help companies build diverse teams and [Magpie Supply](#), a solution to solve transportation problems for farmers in Colorado.

The [10 finalist teams](#) will meet again for Mentor Weekend April 21-23 in Boulder with Go Code Colorado partners Google, CA Technologies, Techstars, House of Genius and Boomtown to further develop their apps and businesses.

A May 24 [final competition](#) will take place at the Denver Performing Arts Center, during which a panel of judges will select three winning teams to receive a contract with the state that includes \$25,000 per team.

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The next newsletter goes out in July. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org

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In This Issue, January 2017

- [U.S. Census Presents "Road to 2020"](#)
- [DRCOG's New Land Use Forecast and Land Use Explorer](#)
- [DRCOG's Denver Regional Aerial Photography Project Update](#)
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U.S. Census Presents "Road to 2020"

Article submitted by Angeles Ortega, partnership specialist for the 2020 Census, U.S. Census Bureau. Angeles can be reached at 720-962-3872 or angeles.ortega@census.gov.

As of Jan. 1, there were only 1,186 days until Census Day 2020 (April 1). This census will require counting an increasingly diverse and growing population of around 330 million people in more than 140 million housing units.

The count is mandated by Article I, Section 2 of the Constitution and takes place every 10 years. The data collected determine the number of seats in the U.S. House of Representatives (apportionment) for each state and how to distribute billions in federal funds to local communities.

The U.S. Census Bureau is currently researching four areas representing the major cost drivers of the decennial census:

1. Using the internet to increase self-response.
2. Using existing government data sources to answer census questions and reduce follow-up workload.
3. Automating operations to increase productivity, reduce staff and reduce offices.
4. Using existing maps and addresses to reflect changes rather than walking every block in every neighborhood.

The decennial census requires years of research, planning and development to ensure an accurate and complete count.

The participation of local governments in our geography programs now is vital, because it allows us to correctly count your community's residents. Stay tuned for information from the U.S. Census and DRCOG regarding how to get involved.

For more information, visit the [U.S. Census Bureau](#).

DRCOG's New Land Use Forecast and Land Use Explorer

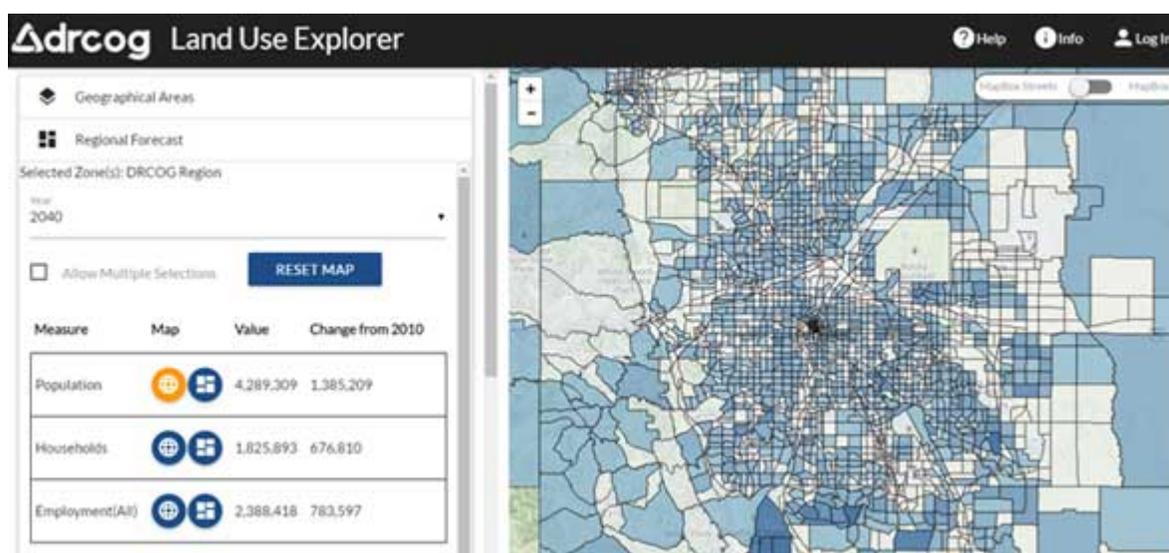
Article submitted by Dan Jerrett, DRCOG chief economist, and Justin Martinez, DRCOG economist. Dan can be reached at 303-480-5644 or djerrett@drcog.org. Justin can be reached at 303-480-5637 or jmartinez@drcog.org.

One of DRCOG's roles as a metropolitan planning organization is to make predictions about where people will live and work in the future, so services like transit and regulations like zoning can be planned to meet upcoming needs. This process starts with understanding the current environment and then uses assumptions about key variables and a sophisticated model to forecast future conditions.

DRCOG recently completed a new land use forecast for the nine-county region using UrbanSim, a new model. UrbanSim is a computational representation of metropolitan real estate markets interacting with transport markets. It models the choices made by households, businesses and real estate developers, including how those choices influence governmental policies and investments. The socioeconomic team at DRCOG worked with member jurisdictions to collect data on zoning and future build-out plans to better inform the forecasting process. The updated forecast produces a spatial allocation of households and employment to the horizon year of 2040.

To help visualize the data, DRCOG is launching a new web map that provides an interactive look into the most recent regional land use forecast. Through Land Use Explorer, users will be able to view population, household and employment forecasts for areas that interest them (for example, traffic analysis zones, municipalities, counties and urban centers). A unique feature of Land Use Explorer is that users will be able to aggregate forecast totals across custom regions of multiple traffic analysis zones, making it easier for planners to view population, household and employment forecasts that more closely match small area planning subregions. The Land Use Explorer will also promote collaboration with stakeholders in the DRCOG region by enabling them to provide feedback on the UrbanSim forecast through a commenting feature.

Look for it online soon!



DRCOG's Denver Regional Aerial Photography Project Update

Article submitted by Ashley Summers, GISP, PMP, DRCOG information systems manager. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

In the spring and summer of every even year, DRCOG facilitates a project to acquire high-resolution aerial imagery for our 7,000-square-mile region. The project takes two years to plan, execute and deliver the imagery, but it's worth the wait. The resulting data is four-band, leaf-off, snow-free and meets [strict positional accuracy standards](#) set by the American Society for Photogrammetry and Remote Sensing. Check out the [project extent](#) to see where we acquired 3-inch, 6-inch and 1-foot resolution imagery.

Imagery will be available for the public to purchase as a web map service or by the tile this spring from our resellers - [Harris MapMart](#) and [Sanborn Map Company](#). Contact [Tyler Rowse](#) or [Jason Caldwell](#), respectively, for quotes.



This effort is funded by 50 organizations including seven DRCOG counties, 30 DRCOG cities and towns and 13 regional partners. Project partners experience deep discounts on the data, receive data before it's available to the public and help determine acquisition specifications. If you'd like more information on how to become a partner on the upcoming 2018 project, contact Ashley Summers, DRAPP project manager at 303-480-6746 or asummers@drcog.org.

DRCOG's Planimetric Project Update

Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

In June 2016, DRCOG wrapped up a large data acquisition project that produced detailed infrastructure information for the region. In partnership with 21 local and regional partners, we acquired information such as building outlines, sidewalks, parking lots and structures, and pavement information drawn through interpretation of aerial imagery. All data is available for free, public download from the [Regional Data Catalog](#).

So far, the data has proved useful for a variety of applications, including pedestrian routing, building inventories, impervious surface analysis, creating emergency response plans, and sidewalk quality and availability studies.

DRCOG is coordinating an effort to keep this data up-to-date. Already 25 partners have expressed interest in funding updates and new data collection across the region. Work is expected to begin in the first quarter of this year and will use the 2016 DRAPP imagery as the source. Data is expected to be delivered in the third quarter of this year and will be made available via DRCOG's [Regional Data Catalog](#).

Even with 25 partners, we do not yet have funding to update the entire area captured via the previous project. If you are concerned that your area of interest will not be covered and would like to contribute funding to acquire that area, please contact Ashley Summers, planimetric project manager at 303-480-6746 or asummers@drcog.org.

Did You Miss the Last DRDC Meeting?

In November, the Denver Regional Data Consortium (DRDC) meeting featured updates from DRCOG, the U.S. Census Bureau, and Governor's Office of Information Technology. If you missed the meeting and you want to see what's on the horizon for these agencies, check out the [presentation materials](#).

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The next newsletter goes out in April. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org to contribute.

Publications

- DRCOG GIS staff wrote an article that appeared in ESRI's *ArcUser* Fall 2016 issue! Read about how DRCOG's webmap cut costs on the planimetric project by allowing partners to do their own quality assurance/quality control in "[Collaborative Quality Control Saves Money on Data Project](#)."
- Local GIS guru Brian Timoney does a cool analysis on the "[Geographic Patterns of Car Sharing in Denver](#)."

New and Updated Resources Available in DRCOG's Regional Data Catalog

- [Transportation Management Areas and Organizations](#)
- [Assisted Living Facilities](#)
- [Nursing Homes](#)
- [Metro Vision 2040 Regional Roadway System](#) (map)
- [Metro Vision 2040 Fiscally Constrained Roadway Network](#) (map)
- [Mile High Compact Participants](#) (map)

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact Ashley Summers, DRCOG information systems manager, at 303-480-6746 or asummers@drcog.org

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In This Issue, October 2016

- [National Renewable Energy Laboratory Uses DRCOG Building Roofprints to Estimate Energy Savings](#)
- [OpenColorado Upgrades the Data Catalog](#)
- [DRCOG Launches New Signal Timing Briefs Map](#)
- [Centennial Offers a Virtual Tour of Local Breweries](#)
- [Your Article Goes **Here!**](#)
- [New/Updated Resources Available in DRCOG's Regional Data Catalog](#)

National Renewable Energy Laboratory Uses DRCOG Building Roofprints to Estimate Energy Savings

Article submitted by Dan Macumber, NREL commercial buildings engineer. Dan can be reached at Daniel.Macumber@nrel.gov.

Right: A NREL engineer views building data in 3D.

Researchers at the National Renewable Energy Laboratory in Golden have been generating city- and district-scale energy models based on public data sets including the new [building footprint data](#) from DRCOG.

NREL's system combines data from multiple public data sources to create individual [OpenStudio](#) energy models for specific buildings. For cities with energy data transparency laws, actual energy use of buildings reported through the [SEED platform](#) can be used to calibrate the energy models to historic data. Once researchers create an energy model for a particular building they are able to estimate the energy savings of common energy efficiency measures. Doing this at a city scale allows cities and utilities to study the potential effects of energy efficiency programs as they seek to meet aggressive goals for energy and carbon savings. DRCOG's data set allows researchers to customize each building model to a unique building

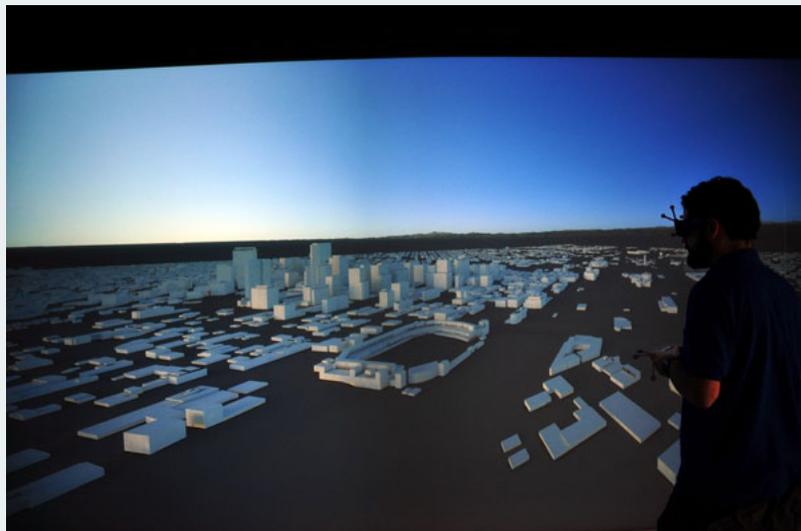


Photo credit: Kenny Gruchalla, NREL

footprint, further reducing uncertainty in the model and improving its predictive capabilities.

Access to detailed public data, such as DRCOG's building roofprints, will enable NREL to provide more specific recommendations for cost effective energy efficiency upgrades. Public open data can provide a wealth of information and will help NREL improve energy use at a large scale.

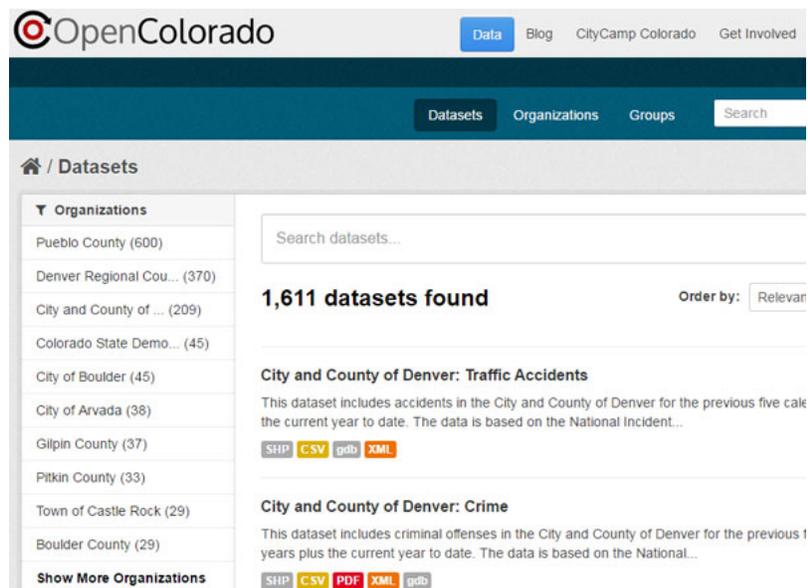
OpenColorado Upgrades the Data Catalog

Article submitted by Scott Primeau, OpenColorado president. Scott can be reached at 303-877-0009 or scott.primeau@opencolorado.org.

OpenColorado recently upgraded its data catalog to CKAN version 2.5.2, with the help of Xentify Corporation.

The upgrade brings several functional and performance improvements, such as:

- More built-in dataset previews;
- A more user-friendly look and feel;
- API access to datasets;
- The option to mark datasets as private or public;
- Improved dataset authorization under organizations; and
- Performance improvements.



The screenshot shows the OpenColorado website's data catalog. The header includes the OpenColorado logo and navigation links for Data, Blog, CityCamp Colorado, and Get Involved. Below the header, there are tabs for Datasets, Organizations, and Groups, along with a search bar. The main content area is titled "/ Datasets" and features a sidebar with a list of organizations and their dataset counts: Pueblo County (600), Denver Regional Cou... (370), City and County of ... (209), Colorado State Demo... (45), City of Boulder (45), City of Arvada (38), Gilpin County (37), Pitkin County (33), Town of Castle Rock (29), and Boulder County (29). A "Show More Organizations" link is at the bottom of the list. The main content area displays a search bar with the text "Search datasets...", followed by the text "1,611 datasets found" and an "Order by: Relevan" dropdown menu. Two dataset preview cards are visible: "City and County of Denver: Traffic Accidents" and "City and County of Denver: Crime". Each card includes a brief description and a row of format icons (SHP, CSV, gdb, XML).

OpenColorado is also planning more enhancements in the near future, including:

- Data catalog analytics;
- Enhanced dataset views; and
- Federating data with other data catalogs.

Scott Primeau, OpenColorado president, expressed appreciation to the catalog's data partners for their support and encouragement to continue to improve. Xentify Corporation provided pro bono development support for the upgrade, as well as several other improvements to the OpenColorado data platform. As OpenColorado works toward expanding the data catalog, it welcomes continued input and support from its data partners.

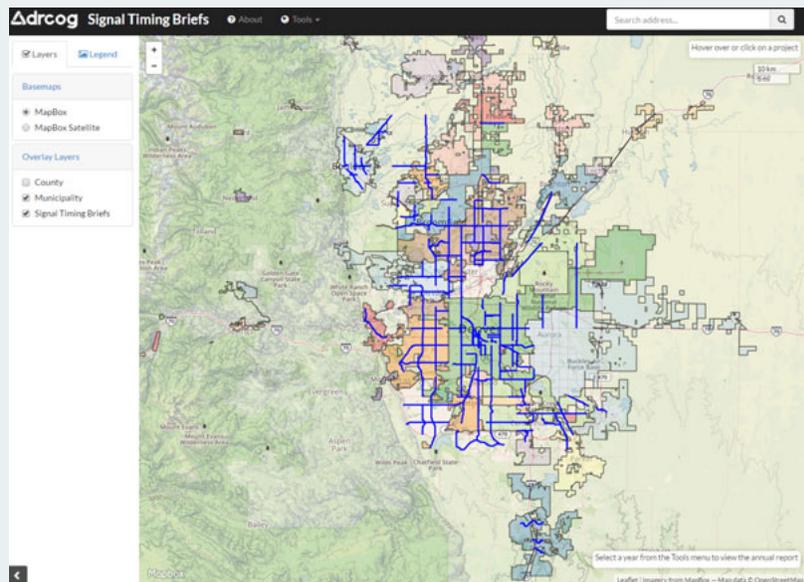
DRCOG Launches New Traffic Signal Timing Briefs Map

Article submitted by Jenny Todd, senior GIS specialist at DRCOG. Jenny can be reached at 303-480-6754 or jtodd@drcog.org.

DRCOG's has unveiled a new web map related to [traffic signal timing](#). Through its [Transportation Operations Program](#), DRCOG staff works with member governments to develop and implement capital and signal timing coordination improvements, increasing the ability of jurisdiction staff to maintain reliable operations while decreasing delays at

signalized intersections across jurisdictions. The cooperative effort reduces traffic congestion, improves air quality, decreases fuel consumption and improves roadway operations efficiency.

Like DRCOG's other web maps, the [Signal Timing Briefs map](#) is built on an open-source stack. DRCOG uses a combination of JavaScript, Leaflet and Bootstrap to develop its maps. Recently, DRCOG has started using the D3 JavaScript library for additional flexibility and enhanced visualizations (the Signal Timing Briefs map uses D3 to draw and filter the GIS data).



The [Signal Timing Briefs map](#) shows the projects completed during the last ten years. Users can find summary statistics for each project and link to the project's official timing brief. If a corridor has had multiple projects, users can view the brief for each year the project was conducted. Lastly, when users filter by project year, they can access an annual summary in the lower right-hand corner.

DRCOG staff appreciates comments and feedback on the [Signal Timing Briefs map](#).

Centennial Offers a Virtual Tour of Local Breweries

Article submitted by Derek Stertz, GIS and data analytics supervisor at Centennial. Derek can be reached at 303-754-3445 or dstertz@centennialco.gov.

There are five breweries in Centennial — with more to come — and the City of Centennial wanted to create an easy, interactive way for residents to discover what's in their own backyard.

The [Centennial Virtual Brewery Tour](#), resulting from collaboration among the city's communications, Geographic Information Systems and economic development departments, takes residents and non-residents on a web-based journey through the breweries and introduces them to the people and ideas behind the local craft-beer industry.



Using an online mapping tool from Esri, the tour pinpoints the exact location of each brewery while displaying (on the same screen) recorded interviews with the brewmasters, behind-the-scenes photos and detailed narratives that provide a glimpse inside the arduous-but-rewarding world of beer-making.

Go to www.centennialco.gov, click on the "Things to Do" tab, then click on "Virtual Brewery Tour" under the "Places To Go" section. Cheers!

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The next newsletter goes out in January. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by December to contribute.

New/Updated Resources Available in DRCOG's Regional Data Catalog

[Crash Data Points 2013](#)

[Open Space 2015](#)

[Open Space 2015 \(map\)](#)

[Employment Data 2005-2015](#)

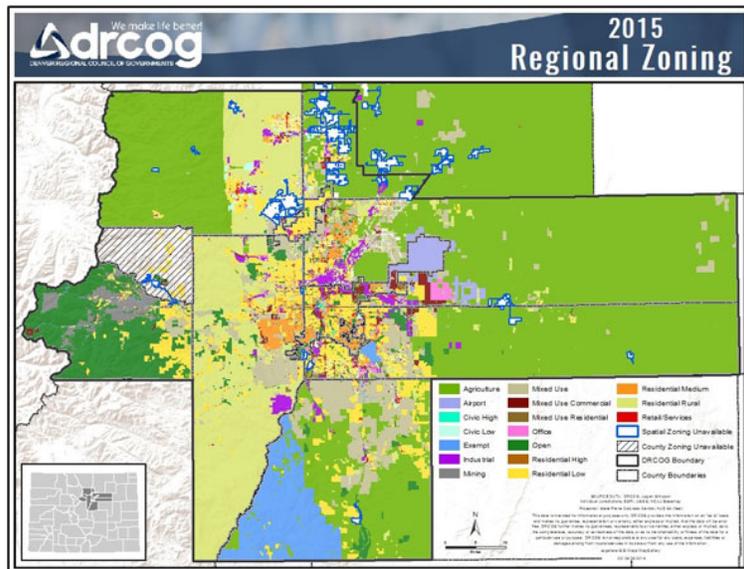
[Municipal Boundaries 2016](#)

[Unincorporated Areas 2016](#)

[Regional Zoning 2015](#) – Check

out our latest regional zoning data! It fills in previous gaps including Weld County, Frederick, Brighton, and Sheridan. More than 3,700 acres of zoning information has been added.

[Regional Zoning 2015 \(map\)](#)



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In This Issue, July 2016

DRCOG Completes Regional Planimetric Data Project

DRCOG Data Used by GoCode Colorado Winners

GIS in the Rockies 2016

Your Article Goes Here!

New Resources Available in the Regional Data Catalog

DRCOG Completes Regional Planimetric Data Project

Article submitted by Ashley Summers, GISP, PMP, DRCOG information systems manager (303-480-6746, asummers@drcog.org).



The 2014 Regional Planimetric Project is officially finished! Data can be downloaded now from our [Regional Data Catalog](#). This specialty data consists of information like building outlines, sidewalks, parking lots and structures, and pavement information drawn through interpretation of aerial imagery. Uses include pedestrian-routing, building inventories, impervious surface analysis, creating emergency response plans, and sidewalk quality and availability studies.

In April, partners that contributed to the project were honored at DRCOG's Annual Awards Celebration. Partners include:

City of Arvada

Denver Water

City of Lone Tree

City of Aurora

City of Englewood

City of Lakewood

Town of Bennett	Town of Frederick	City of Louisville
Town of Castle Rock	City of Glendale	City of Northglenn
City of Centennial	Golden	Regional Transportation District
City of Commerce City	City of Greenwood Village	City of Thornton
City and County of Denver	City of Lafayette	City of Wheat Ridge

Now that the project is complete, we encourage local planners, researchers, entrepreneurs, private industry and others to apply this data in innovative ways. So DRCOG can better understand this project's return on investment, we ask users to [contact us with feedback](#) on the data and their experiences with it.

Even though we've just finished this project, it's already time to start thinking about updates. Based on the success stories we've heard so far, we understand this data to be very valuable. DRCOG would like to see this information kept updated and in sync with the aerial photography program which occurs on even-numbered years. We are tentatively planning a project update for 2017 (based on the 2016 imagery). This update will only be possible with contributions from the user community. Please [email us](#) if you are interested in contributing!

DRCOG Data Used by GoCode Colorado Winners

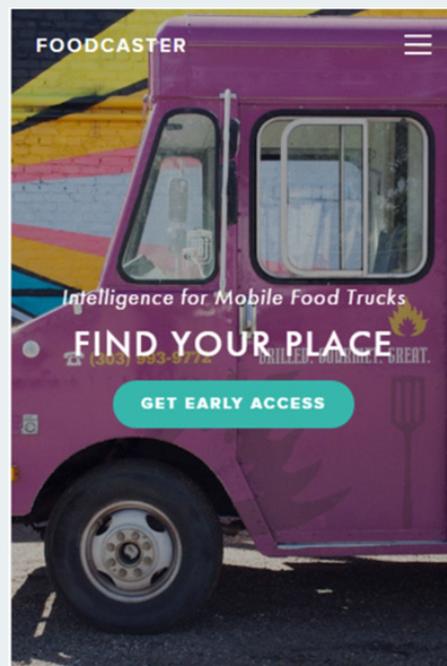
Article submitted by Margaret-Rose Spyker, GISP, LEED GA, GIS and data analyst at Xentivity Corporation (269-806-1948 or mspyker.xentivity@gmail.com) and Ashley Summers, GISP, PMP, information systems manager at DRCOG (303-480-6746 or asummers@drcog.org).

[GoCode Colorado](#) is a program sponsored by the Business Intelligence Center in the [Secretary of State's](#) office and supported by two contractors: [Xentivity Corporation](#) and [LadyCoders Productions](#). The former works with government agencies to make quality datasets available in the state's open data portal: the [Colorado Information Marketplace](#). The latter is fostering a developer community oriented towards building businesses through the use of public data.

GoCode Colorado just finished its third annual app challenge in which teams competed to create apps that leverage data in the public domain. Ten finalist teams advanced from the first round of competition. During this process, GoCode Colorado partnered with many public data providers, and served as a data liaison, helping developers to better understand and use the data they needed to build insightful applications. Public entities contributed to this entrepreneurial endeavor by making data publicly available and machine-readable for the coding community.

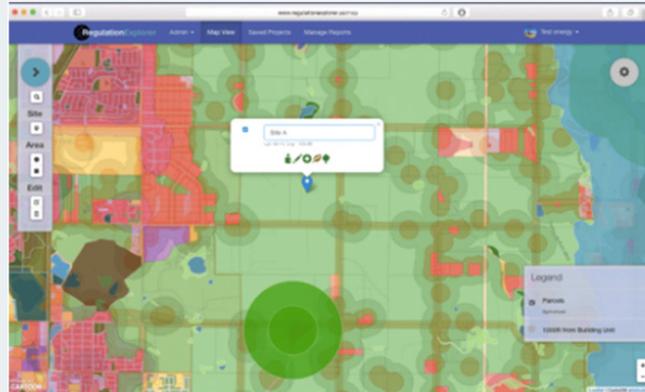
Three of the 10 finalists were awarded \$25,000 toward the development of a business around their app. Almost all of the ten finalist teams used DRCOG datasets. Two of the winning teams are described below:

[Foodcaster](#) helps food trucks find the best location to park by informing food truck owners



of parking regulations, foot traffic and other tips such as local events and activity through its mobile app. Foodcaster used public datasets showing [bicycle and pedestrian foot traffic](#) (to find concentrations of people), [cellular service data](#) (to ensure that mobile merchant systems can be used), parking regulations, Google Maps, Twitter social data and Facebook events. DRCOG data was also used: [zoning](#) (to quickly find commercial areas and places eligible for seasonal festivals) and [planimetrics](#) (to identify sites that can physically accommodate temporary parking of oversize vehicles near buildings).

[Regulation Explorer](#) helps oil and gas companies find the best locations by putting Colorado oil and gas regulations on the map in combination with environmentally and culturally sensitive areas. Regulation Explorer streamlines the permit process for energy companies, providing these companies with all of their options before they invest heavily in a well location. Datasets used include:



community anchor institutions, roads, parks, county parcels and land management datasets. DRCOG data was also used, including: [zoning](#), [planimetrics](#), [nursing homes](#) and [assisted living facilities](#).

This article is an excerpt from a [Xentity blog](#).

GIS in the Rockies 2016

[GIS in the Rockies](#), the Rocky Mountain West's premier geospatial information and technology conference, returns to Denver Sept. 21 and 22, 2016.

Conference highlights include:

- **Two dynamic [keynotes](#):**
 - [Matt Sheehan](#), founder, principal and senior GIS developer at [WebMapSolutions](#) and [blogger](#)
 - [Brian Timoney](#), owner of [The Timoney Group](#) and Colorado [geospatial fixture](#)
- **[Pre-conference professional workshops \(Tuesday, Sept. 20\)](#):** Stay on top of ever-changing technology
- **[Career development academy](#):** Interview skills/resume-building workshop, mock interviews, career topic roundtables, university and GIS Society booths.
- **Great slate of [exhibitors](#)**
- **[Post-conference tours \(Friday, Sept. 23\)](#):** Boulder Emergency Operations Center, DigitalGlobe Headquarters, Denver International Airport Enterprise GIS Program
- **Conference social event:** Networking and GISITR geo quiz

See the [full schedule of events](#) (including [sessions](#), poster session, GIS scavenger hunt and field data collection tools demonstration), learn more and register at [GIS in the Rockies](#).

July 26: GIS in the Rockies networking event

Join the GIS in the Rockies Planning Committee for a geospatial networking meetup at 6 p.m., Tuesday, July 26 at [Fado Irish Pub](#) across from Coors Field. Food is provided at no charge courtesy of GIS in the Rockies. Network with geospatial professionals including conference keynoter Brian Timoney and learn more about GIS in the Rockies and the great events the conference has to offer.

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The next newsletter goes out in October. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by September to contribute.

New Resources Available in the Regional Data Catalog

- [Municipalities 2016](#) and [map](#)
- [DRAPP project areas 2016](#)
- [Traffic analysis zone boundaries](#)
- [Bicycle facilities](#)
- [Regional traffic counts](#)
- [Final planimetrics data](#)
- [Regional aging population](#)
- [Strava Bike To Work Day Riders](#)

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- [Start-up Uses DRCOG's Planimetric Data to Help the Visually Impaired](#)
- [Regional Planimetric Project Update](#)
- [Denver Water Uses DRCOG's Regional Zoning Data](#)
- [DRVR Workshops and Training](#)
- [Your Article Goes **HERE!**](#)
- [New Resources Available in the Regional Data Catalog](#)

West Meadows Metropolitan District Uses DRCOG's Planimetric Data

Article submitted by Jim Castagneri, geographer at U.S Census Bureau (720-962-3882, James.D.Castagneri@census.gov).

As a geographer with the U.S. Census Bureau, I spend my days working with geospatial data from a variety of sources. So when my role as secretary of the West Meadows Metropolitan District required map information about the infrastructure of the district and surrounding neighborhoods, I naturally turned to GIS. Unfortunately, until the recent release of planimetric data from DRCOG, I had little option but to hand-digitize much of what I needed. My requirements were not quite engineering-level data, but more detail than what public data (like TIGER) could provide. I was faced with hand digitizing sidewalks and road edges, greenways, and rights of ways. For a small district, this is not a huge task. You might wonder; why does a special district need such things?



Metropolitan districts in Colorado often provide municipal services for unincorporated areas that might normally be provided by a city. In our small district, we are responsible for all landscape maintenance and facility upkeep along the right of way for West Coal Mine Avenue. This includes landscaping, sidewalk concrete, street lights, path lighting, sprinkler lines, turf, trees, flower beds, and park benches. The board of directors is responsible for executing and managing annual contracts for maintenance services and repairs. Without an accurate map of the district, it is very difficult to keep track of resources and improvements that have been made. This is where planimetric data in a GIS will prove invaluable for the West Meadows Metropolitan District. We can now plan, monitor, and evaluate work in a more efficient manner. We can produce work orders and request for proposal that include accurate maps of the area in question. This leads to more concise work descriptions and more clearly defined contracts. We can analyze

distances, area measurements, and determine which housing units might be affected by trenching for water lines for example.

Creating such data in-house would be cost prohibitive for all but the largest districts. By providing open-source planimetric data to public, DRCOG has changed the face of managing special districts forever.

Start-up Uses DRCOG's Planimetric Data to Help the Visually Impaired

Article submitted by Sumanth Channabasappa, Co-founder and CTO at eyeBot (Sumanth.asap@gmail.com).

At [eyeBot LLC](#) we are building solutions to help the blind and visually impaired solve a big everyday problem: How to safely navigate city streets and indoor areas. Challenges for blind and visually impaired people range from an absence of spatial awareness to, unfortunately, collisions with obstacles and vehicles. Just ask our colleague and CEO Mike Hess!



As a Colorado startup, we want our cities to lead the nation in enabling accessibility and welcoming blind and visually impaired users. To realize our initial mobile app based interface we needed local geographic data with more granularity than what Map providers were offering. We were recommended the DRCOG Planimetric data by friends who work for the City and County of Denver and the State of Colorado. This proved to be a fruitful suggestion. This data is now a part of our solution that provides spatial awareness.

We are in the process of testing and refining our solution with the help of BVI friends, and in early discussions about trials to make cities more accessible. As one can imagine our solutions have many uses beyond the blind and visually impaired community.

DRCOG's Regional Planimetric Project Update

Article submitted by Ashley Summers, GISP, DRCOG information systems manager (303-480-6746, asummers@drcog.org).

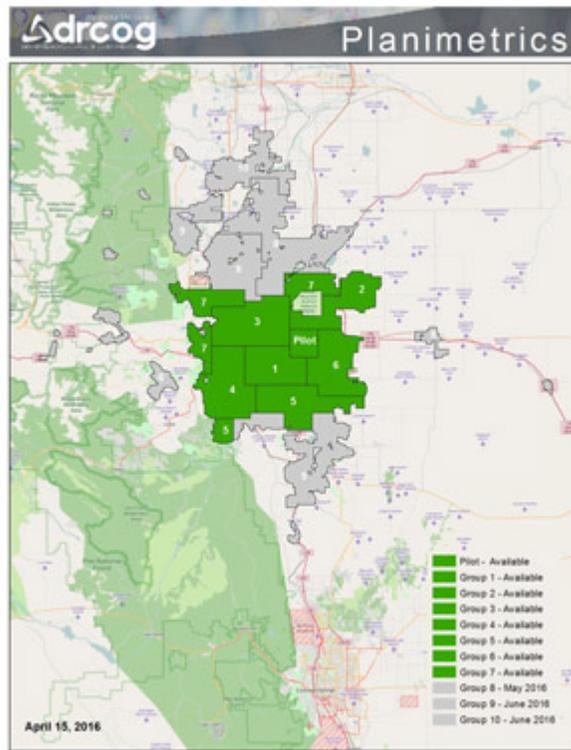
DRCOG is nearing the end of a giant project to procure detailed infrastructure data for the region. Currently eight of 11 sections of the region have been delivered and we are on schedule to finish mid-summer. Check out our progress on the map. [Data can be downloaded now from our Regional Data Catalog.](#)

DRCOG would like to thank the partners that contributed funding to the purchase of this data for the region. Without their participation, this project could not have happened.

"Their foresight to imagine the process improvements, innovative research, and entrepreneurship fostered by this data shows their commitment to regionalism."
– DRCOG Executive Director Jennifer Shaufele

These partners will be recognized at DRCOG's Annual Awards dinner April 27:

- Brian Davis - City of Arvada
- Bill Keever - City of Aurora
- Trish Stiles - Town of Bennett
- Jeff Caldwell - Town of Castle Rock
- Derek Stertz - City of Centennial
- Kirk Hayer - City of Commerce City
- Doug Genzer - City and County of Denver
- Robert Stansauk - Denver Water
- John Voboril - City of Englewood
- Cindy Kamigaki - Town of Frederick
- Kevin Brown - City of Glendale
- Kim Soulliere - City of Golden
- Jack Cornelius - City of Greenwood Village
- Roger Caruso - City of Lafayette
- Mike Demmon - City of Lone Tree
- Kevin Corzine - City of Lakewood
- Chris Neves - City of Louisville
- Travis Reynolds - City of Northglenn
- Dan Jackson - Regional Transportation District
- Deborah Wilson - City of Thornton
- Annabel Montoya - City of Wheat Ridge

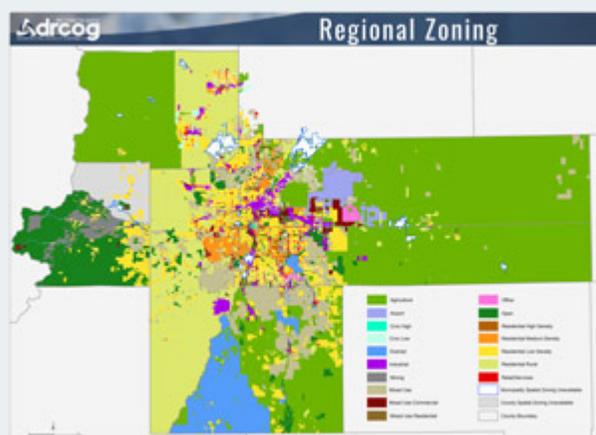


Denver Water Uses DRCOG's Regional Zoning Data

Article submitted by Mitch Horrie at Denver Water (303-628-6703 or mitch.horrie@denverwater.org).

Denver Water serves 1.3 million people in a service area that spans 336 square miles and includes the City and County of Denver and many surrounding suburbs. How the Denver metro region grows will influence the demand for water and we must be prepared to meet the water needs of our service area into the future.

Denver Water has long relied on DRCOG's demographic projections to generate water demand forecasts. More recently, we have been interested in integrating zoning information into our water demand forecast modeling. The regional zoning data provided by DRCOG is valuable in planning to meet the water needs of the future because it helps shed light on the opportunities and limitations for growth in our service area as we explore futures where population grows at varying rates and patterns.



Check out DRCOG's [Regional Zoning Data](#) and [Map](#) in the [Regional Data Catalog](#).

DRVR Workshops and Training

Article submitted by Ashley Summers, GISP, DRCOG information systems manager (303-480-6746, asummers@drcog.org).

DRCOG launched the new [Denver Regional Visual Resources \(DRVR\)](#) site in October 2015 and has spent the first quarter of 2016 on a roadshow to introduce it to planners, GIS professionals, community advocates, and media in the region.

We're hearing that the site is useful for grant writing, seeing local projects/programs in context, understanding trends for better planning, and for making presentations. Some of our workshop attendees said:

"... the maps were visually appealing, and the data behind them is so robust." It will be useful "when assisting small business entrepreneurs and nonprofits needing info on demographics and statistical facts in the Denver metro area."
— Denver Public Library

"I'm thrilled to have the data accessible in one resource."
— Local newspaper

"This has the potential to be of great use to a number of city departments such as Community Development, City Manager's Office and Finance." -
--Local GIS Coordinator

Learn more about DRVR through our [handout](#) and [FAQs](#).

If you'd like for someone from DRCOG to reach out to your agency about DRVR, please us know. We are happy to show you around the site!

Your Article Goes HERE!

The Data Consortium Newsletter is facilitated by DRCOG but is designed to be written by GIS professionals like you. This quarterly newsletter reaches more than 200 people and has a higher-than-average open rate. It's the perfect place to show off your projects, highlight your great work, and contribute ideas to the GIS community in the Denver Region.

The next newsletter goes out in July. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by June to contribute.

New Resources Available in the Regional Data Catalog

- [Planimetric Data](#) - Areas 1 -7 now available for download
- Regional Zoning - Check out the [map](#) and the [GIS data](#)
- Legislative Profiles - Check out the [PDFs](#) and the [interactive DRVR visualization](#)
- Community Profiles - Check out the [PDFs](#) and the [interactive DRVR visualization](#)
- All new branding - Check out our [updated Map Gallery](#)

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG Information Systems Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

Disclaimer: The information provided in this newsletter is compiled from multiple sources and is intended for informational purposes only. DRCOG assumes no responsibility or legal liability for the accuracy, completeness or usefulness of any information in this newsletter.

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In this Issue, January 2016

DRCOG Creates Regional Zoning Layer

Enhancing the OpenColorado Data Catalog

Your Article Goes Here!

Learn about DRVR at CAVEA

Mile High Data Day

DRCOG's Annual Data Request

Regional Planimetric Project Update

New Data Available in the Regional Data Catalog

Interesting Reading

DRCOG Creates Regional Zoning Layer

Article submitted by Ashley Summers, GISP, DRCOG information systems manager (303-480-6746, asummers@drcog.org).

DRCOG has been working on a regional zoning layer for many months and we're happy to report that we see a light at the end of the tunnel! Creating this layer is difficult because local zoning codes vary substantially across the region. Our goal is to create a regional classification in which local codes are nested.

Over the summer and fall of 2015, DRCOG worked with a consultant to mine data from all the available zoning codes in the region. We then crosswalked those codes to a regional code containing 17 categories and mapped the results using local spatial data. DRCOG then dissolved the data by the regional categories so local data at the parcel level is obscured.

This month local jurisdictions will get to preview the data before DRCOG makes it public in the spring via the Regional Data Catalog. A [draft map](#) is attached to illustrate the product.

DRCOG intends to create this regional dataset annually.

Enhancing the OpenColorado Data Catalog

Article submitted by Scott Primeau, president, OpenColorado (303-877-0009, scott.primeau@opencolorado.org)

[Xentity Corporation](#) recently reached out to OpenColorado to offer pro bono technical and development support for data.opencolorado.org. With data.opencolorado.org running on [CKAN](#), OpenColorado represented a good opportunity for Xentity to build its expertise with the open-source data platform.

Xentity also supports the State of Colorado's open data platform, data.colorado.gov, by curating, publishing and maintaining data in support of [Go](#)

[Code Colorado.](#)

Some of the recent improvements that Xentity has supported are:

- Resolving data upload problems;
- Building a backup and recovery process;
- Restoring the data catalog [test site](#); and
- Upgrading the data catalog to CKAN version 2.3.1.

With these efforts, Xentity and OpenColorado are building needed infrastructure to upgrade and enhance the data catalog with the latest open data tools and capabilities.

For those who use the OpenColorado data catalog for publishing or accessing data, we invite you to review the test site at demo.opencolorado.org and provide feedback for improvement.

Enhancing the data catalog is one of OpenColorado's focus areas for building long-term stability for the organization and the data catalog. The pro bono support also allows OpenColorado to keep its costs low and continue making the data catalog free to use.

In previous years, OpenColorado was funded through corporate, government and nonprofit sponsorships. We would like to build a more sustainable funding model supported by OpenColorado's users.

We are seeking contributions from our data partners and others who use the data catalog. The OpenColorado data platform will remain free to use, and your contributions will help continue moving us forward.

OpenColorado's costs remain low, less than \$200 per month, thanks to volunteer management and pro bono technical support. Even a small contribution will help. Please [contribute here](#).

Your Article Goes Here!

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The next newsletter goes out in April. To contribute, please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by March.

Learn about DRVR at CAVEA

Save the date! DRCOG will host a workshop featuring our newest website addition - [Denver Regional Visual Resources](#) (DRVR). This site provides interactive graphics and dynamic visualizations that explain key regional topics including economics, demographics, transportation and aging. The workshop will focus on what information is available and how it can be used at the local level.

[Read more here](#) and join us on the morning of **Feb. 17** at the [Center for Advanced Visualization and Experiential Analysis](#) (CAVEA) on the Metropolitan State University of Denver campus.

Due to space, participation is limited to 25 attendees, so register early. Laptops for exploring DRVR will be provided.

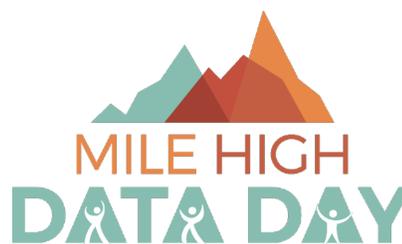
More information and a formal invitation will follow shortly. If you have questions or comments, please contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

[Register Now!](#)

Mile High Data Day

In today's open-data culture, we have the ability to use data to tell stories, collaborate across organizations and make data-informed decisions that have the power to improve lives.

The Piton Foundation's [Data Initiative](#), [Open Colorado](#), [Denver Regional Council of Governments](#), [University of Colorado Denver](#), and [Mile High Connects](#) invite you to learn how to combine these elements and use open data to drive social change at the first-annual Mile High Data Day **Feb. 19** at the [University of Colorado Denver](#). Join the Denver metro region's data community as we share best practices and strengthen our region's data culture.



Mile High Data Day attendees will have the opportunity to:

- Build relationships, share best practices and learn from experts.
- Strengthen partnerships between social-change and data organizations.
- Create a vision for a network focused on using data to support community change.

Mile High Data Day will include keynote speaker [Steve Spiker](#), panels and interactive breakout sessions. Visit The Piton Foundation's [website](#) for more information or [register online](#).

DRCOG's Annual Data Request

Article submitted by Ashley Summers, GISP, DRCOG information systems manager (303-480-6746, asummers@drcog.org).

Earlier this week, DRCOG reached out to local jurisdictions to ask for spatial data. Our 2016 request consists of the following datasets:

- Open space
- Zoning
- Bikes and Trails
- County and Municipal Boundaries
- Parcels

- Buildings/Addresses
- Districts and Authorities
- Building Permits
- Subdivisions → **New this year!**

Information on each of these items was provided in the request, including the specific attribution we need and why these layers are important to DRCOG.

Additionally, DRCOG serves as an intermediary data manager between local and state government. The [State Office of Information Technology](#) (OIT) is interested in [additional datasets](#). Local jurisdictions may respond to them directly or they can use the DRCOG Data Portal as the means of responding to both DRCOG and state requests. For convenience, DRCOG staff will pass data of state interest along to OIT.

Please let us know if you didn't receive the official request and feel free to contact us with questions or concerns.

DRCOG's Regional Planimetric Project Update

Article submitted by Ashley Summers, GISP, DRCOG information systems manager (303-480-6746, asummers@drcog.org).

DRCOG's Regional Planimetric Project is moving along on schedule! The goal is to purchase detailed infrastructure information for more than 1,000 square miles of urbanized area in the Denver Metro Region. To date, four out of 11 areas have been completed and made [available for public download on the Regional Data Catalog](#). Check out a [map of the progress](#).

All datasets from the project are being put immediately in the public domain to foster innovative research and entrepreneurship in our communities. Already this data is being investigated for pedestrian-routing, building inventories, mobile apps to aid the visually impaired, impervious surface analysis, and sidewalk quality/availability studies.

Available datasets include: Building Roofprints, Trails, Ramps, Centerline Sidewalks, Pavement Lines, Pavement Polygons, Parking and (for a smaller geography) Polygon Sidewalks, Driveways, Water Bodies, River Lines and River Polygons.

All data has been digitized from the 2014 Denver Regional Aerial Photography Project (DRAPP) imagery. This project is funded by DRCOG in partnership with 20-plus local and regional partners.

New Data Available in the Regional Data Catalog

[Higher Education](#)

[Schools Pre-K to 12th Grade](#)

[Planimetric Data](#)

Interesting Reading

- [Broomfield's Open Data Portal in ArcGIS](#)
- [Colorado GIS Tactical Plan](#)
- [Colorado LIDAR Plan](#)

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG Information Systems Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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October 15, 2015

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

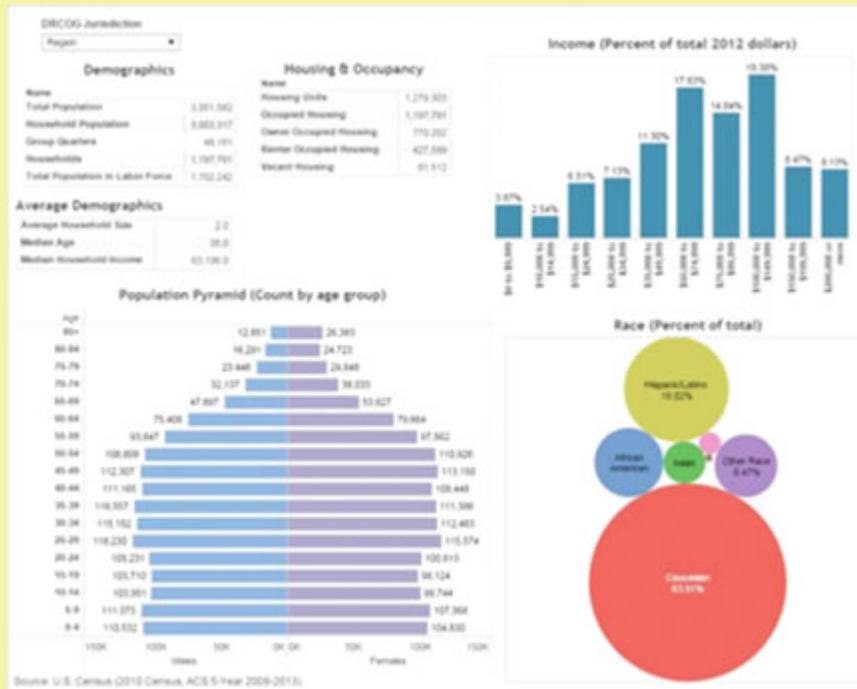
DRCOG Launches Denver Regional Visual Resources (DRVR) Site

Article submitted by Ashley Summers, GISP, Information Systems Manager and DRVR Project Manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

In early October, DRCOG launched a new online tool called Denver Regional Visual Resources (DRVR). DRVR is a repository of data-driven stories and infographics

that explain the state of our region, focusing on transportation issues, employment and population trends, land use, and aging. These resources are meant to explain issues quickly and clearly, to provide a basis for discussion, and to inform decision-making.

DRVR is a public tool meant for a wide audience. Our goal is to empower anyone with an interest in local and regional planning topics - from local officials, to community and advocacy groups, to the public. It provides regional context and local insight on key topics supports data-driven decision making by showcasing important data topics in a compelling way.



Learn more [here](https://drcog.org/DRVR) and check it out for yourself at <https://drcog.org/DRVR>.

Participate in the 2016 Denver Regional Aerial Photography Project (DRAPP)

Article submitted by Ashley Summers, GISP, Information Systems Manager and DRAPP Project Manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

Every two years, DRCOG facilitates the Denver Regional Aerial Photography Project to acquire high- resolution imagery for the entire Denver region. Planning is currently underway for the 2016 project.

Recently the DRCOG board approved the DRAPP selection committee's

recommendation of the **Sanborn Map Company, Inc.** as the 2016 imagery acquisition vendor. Contracting has begun and project requirements are being finalized.

DRCOG also recently received bids for an independent quality control vendor. This vendor will make sure that every tile across our 7,000 square-mile region is checked and approved. Vendor interviews will be performed in mid-October and a decision will be made shortly thereafter.

DRCOG will begin signing up partners for the 2016 project in early November. **If you are interested in participating, please contact Ashley Summers at asummers@drcog.org.**

Celebrate GIS Day with the City and County of Denver



Autumn is in the air and this can only mean one thing: GIS Day is right around the corner! This year's event will take place in the Wellington Webb Bldg Atrium (201 W Colfax Ave) on Wednesday, **Nov. 18 from 10 a.m. - 2 p.m.** The event will showcase a wide range of GIS products, tools and applications from Denver's GIS community. Additionally, there will be a map gallery, interactive map displays, live music performances, presentations, cake and prizes!

Save the Date - Mile High Data Day

In today's open data culture, we have the ability to use data to tell stories, collaborate across organizations, and make data-informed decisions that have the power to improve the lives of others. The Piton Foundation's Data Initiative invites you to learn how to combine these elements and use open data to drive social change at the first annual Mile High Data Day, which is happening on **February 19, 2016** at the University of Colorado Denver.

Join Denver's data community as we share best practices and strengthen our region's data culture. Mile High Data Day 2016 will include speakers, panels and interactive breakout sessions. More details will be available soon, but we hope you will plan on attending!

Planimetrics Data Available Now

Article submitted by Ashley Summers, GISP, Information Systems Manager and DRAPP Project Manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

The Denver Regional Planimetrics Project is starting to produce data! To date, 280+ square miles of coverage has been delivered to DRCOG. DRCOG and its regional partners are performing quality control checks on the data and working with the vendor to finalize the deliveries. The pilot data - a 25 square mile area - is completely done and is available for you to download from our [Regional Data Catalog](#).

The data includes building footprints, edge of pavement, parking lots, trails and sidewalks. All data will be public domain and will be made available for download from DRCOG's Regional Data Catalog as it is completed.

Your Article Goes HERE!

The Data Consortium Newsletter is facilitated by DRCOG but is designed to be written by GIS professionals like you. This quarterly newsletter reaches 200 people and has a higher than average readership. It's the perfect place to show case your projects, highlight your great work, and contribute ideas to the GIS community in the Denver region.

The next newsletter goes out in January. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by December to contribute.

New Data in the Regional Data Catalog

- [Open Space 2014](#)
- [Planimetrics Data](#)
- [2012](#) & [2013](#) Census Bureau's Longitudinal Employment Household Data

Contact Us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG Information Systems Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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July 20, 2015

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- [Contact Us](#)

The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

Urban Growth Boundary/Area Updates

Article submitted by Andy Taylor, AICP, Senior Planner at DRCOG. Andy can be reached at ataylor@drcog.org or 303-480-5636

Since the adoption of Metro Vision 2020 in 1997, the Urban Growth Boundary/Area, or UGB/A, has tracked the region's growth and development. The UGB/A reflects a bottom-up approach to growth management that relies heavily on voluntary collaboration among communities.

The UGB/A includes areas that are 1) currently urban, or 2) anticipated by local communities to be urban in the future. DRCOG relies on local data and input to identify both.

To identify what is currently urban, local data is run through DRCOG Board-adopted mapping rules. DRCOG staff are looking for local GIS staff and planners who are willing to provide feedback on this process later this year. Please contact Jenny Todd (jtodd@drcog.org) if you would like to participate.

Identifying areas for future urban development is the domain of our local governments. Local governments request UGB/A from the DRCOG Board to cover these areas based on local knowledge and plans. The Board has deferred discussions of UGB/A while it attends to updates to the Metro Vision plan. Based

on the anticipated schedule for adopting Metro Vision, DRCOG staff believes communities would be invited to submit requests for UGB/A late in 2015 or the first quarter of 2016.

Much has changed at the local level since the last cycle of UGB/A requests in 2009. Feel free to contact Andy Taylor (ataylor@drcog.org) with any questions or comments. Over the next few months DRCOG staff will be reaching out to local communities to learn more about their experiences managing their UGB/A. Please be on the lookout for opportunities to provide feedback.

DRAPP 2016 Planning is Underway

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

Every two years, DRCOG facilitates the Denver Regional Aerial Photography Project to acquire high-resolution imagery for the entire Denver region. Planning is currently underway for the 2016 project. In March, DRCOG released an RFP for Aerial Imagery Acquisition and Processing. The vendor bids were evaluated, and the top four vendors were interviewed by the selection committee. The committee is made up of partners that volunteered to be part of this critical process and includes representatives from Commerce City, Douglas County, Denver Water, Weld County, Lone Tree, Greenwood Village, Westminster, Denver, Arapahoe County, Wheat Ridge, Castle Rock, Adams County, and Jefferson County. All potential partners have been asked to participate in the planning process by filling out a requirements survey for the 2016 product. Results show that the product in 2016 needs to be similar to previous products, so we will be contracting for 4-band orthoimagery at 3-inch, 6-inch, and 1-foot resolutions.

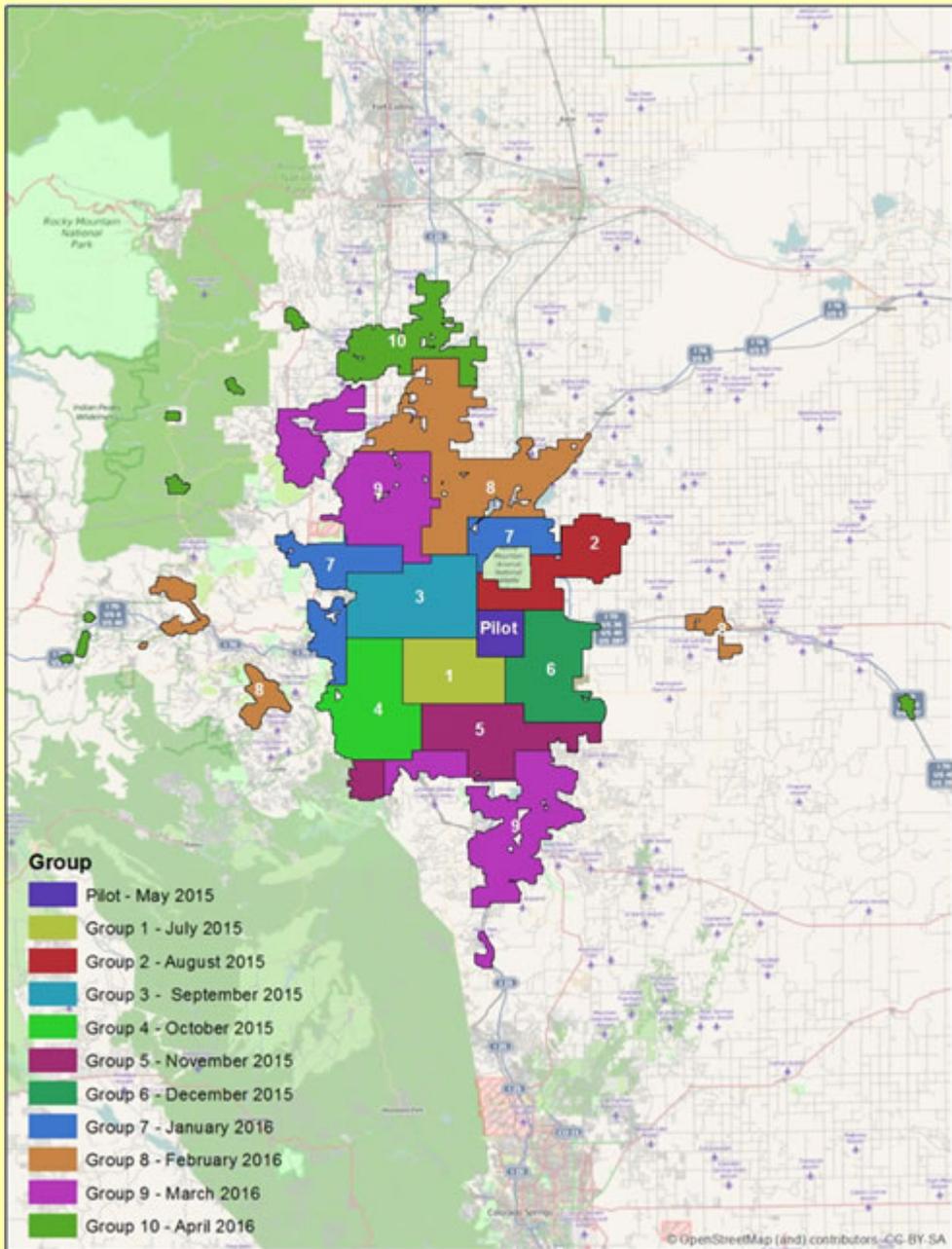
Our next step is to release an RFP for an independent quality control vendor. This is necessary to make sure that every tile across our 7,000 square mile region is checked and approved.

In the fall of 2015, DRCOG will begin officially signing up partners for the 2016 project. If you are interested in participating, please contact Ashley Summers at asummers@drcog.org.

Sneak Peek at Planimetrics Data!

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

The Denver Regional Planimetrics Project is starting to produce data! A 25 square-mile pilot has already been delivered and QAQC'ed by regional partners. The vendor is scheduled to deliver a 70 square-mile area at the end of July. This data includes building footprints, edge of pavement, parking lots, trails and sidewalks. All data will be public domain and made available for download from DRCOG's Regional Data Catalog as it is completed. Please see attached for the delivery map.



Using InfoGroup Data at the City and County of Denver

Article submitted by Doug Genzer, GISP, GIS Data Administrator at the City and County of Denver. Doug can be reached at Douglas.Genzer@denvergov.org or 720-913-4839.

The City and County of Denver has used Infogroup data since 2012 and will be participating in DRCOG's regional funding of the data for 2016. The data are used by various agencies including; Office of Economic Development, Community Planning and Development, Office of Emergency Management, and Technology Services GIS.

The data has been processed into a GIS layer, and is used mostly as general reference layers for businesses data. The data has both NAICS and PRMSIC codes, with text descriptions for each, which allows for specific categories of businesses to be queried out.

Some examples of how the City has used the data:

- Mapping places of worship for the Gang Taskforce
- Mapping drug and alcohol treatment facilities for marijuana analysis
- As a source of daytime and nighttime employment data for emergency management
- Identify employment centers (density of number of employees and number of businesses)
- Targeting for business outreach for retention, expansion and attraction efforts
- Supplement information about the local business environment for the Office of Economic Development's Strategic Lending group
- Understand neighborhood dynamics including business types and sizes
- Analyze locations of employment density in relation to transit
- Identify geographic clusters of businesses in a certain industry group

The data does have its limitations, which includes some data being geocoded to parcel centroids, completeness, and the fact that the data is a snapshot in time. Despite these caveats, the data allows the organization to hit the ground

New Douglas County, CO GIS Open Data Site

Article provided by Joel Hanson, GIS Services Manager, Douglas County. Contact him at 303-663-6285 or jhanson@douglas.co.us

The Douglas County GIS Services Team is happy to announce our new GIS Open Data site for your use: access the site from the following link:
<http://gis.dougco.opendata.arcgis.com>

The new Douglas County GIS Open Data site replaces our old "Data Disk" and was built using our ArcGIS Server and ArcGIS Online infrastructure with hope of aiding the community of GIS professionals. The ArcGIS REST services that feed this site are updated on a monthly basis, and you can link to other sites within Douglas County (and beyond) to retrieve non-spatial data from our Assessor's Office, Clerk and Recorder, Department of Community Development, NOAA, and more. As this site is hosted on ArcGIS Online, we have enabled some "beta" functionality to see how the site performs in providing abilities to preview and analyze the GIS data sets before you decide to download as a spreadsheet, KML, SHP, GeoJSON feed, zipped fGDBs, zipped SHPs, or link directly to the data in your ArcGIS Online web map. Also, the entire site can become a JSON-GeoJSON feed if you are willing to search the web on how to do that.

So, if any of you are looking for free GIS data for purposes of your work, play, or academics I invite you to check out this site to gather data that can assist your

needs. We no longer require signed data agreements for the standard GIS data provided on this site. If you are interested in custom data, hourly rates will apply to that request. Custom data requests can be made via instructions and documents that you can find on our home page:

<http://www.douglas.co.us/government/departments/gis/data-products/>

In closing, I invite you to feel free to check out this site and explore our GIS data offerings. If you have comments or questions, feel free to contact us via the link provided at the bottom of the Douglas County GIS Open Data homepage.

<http://gis.dougco.opendata.arcgis.com>

GIS Coordination Efforts at OIT

Article provided by Jon Gottsegen, State GIS Coordinator. Jon can be reached at jon.gottsegen@state.co.us or 303-764-7712.

The State of Colorado is furthering GIS coordination through funding of additional coordination staff and operations. This support was motivated, in part, by the need to coordinate data after the September 2013 floods. One immediate action by the Office of Information Technology's (OIT) GIS Coordination and Development Program to act on this support was a GIS Data Coordination Summit held in May.

The Summit, held at the Colorado History Center, was attended by approximately 80 participants from local, regional, state and federal agencies, including DRCOG and several of DRCOG's member jurisdictions. The purpose was to provide actionable feedback regarding the objectives and specific data on which state GIS coordination should focus. The attendees helped to identify the lines of business that deserve the most attention in relation to geographic data and the most critical data sets for those lines of business. The top five lines of business according to the participants were emergency management, transportation, law enforcement, economic development and information technology. Natural resource management, specifically water, was close to this top five as well. The critical data

sets included roads, addresses, parcels, high resolution imagery, statewide imagery (i.e., National Agricultural Imagery Program (NAIP)), and railroads. From this input OIT has developed a tactical plan for coordination over this fiscal year.

Your Article Goes HERE!

The Data Consortium Newsletter is facilitated by DRCOG but is designed to be written by GIS professionals like you. This quarterly newsletter reaches 200 people and has a higher than average "open rate." It's the perfect place to show off your projects, highlight your great work, and contribute ideas to the GIS community in the Denver Region.

The next newsletter goes out in October. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by September to contribute.

New Data in the Regional Data Catalog

- [2015 Muni Boundaries](#)
- [2011 & 2012 Crash Data](#)
- [2040 Metro Vision Road Network](#)
- [TIP Polygons 2016-2021](#)
- [TIP Lines 2016-2021](#)

Also, check out our updated TIP Webmap:
<http://gis.drcog.org/tip-projects-map>

Contact Us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG Information Systems Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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April 15, 2015

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

DRCOG Starts Work on a Regional Zoning Map

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

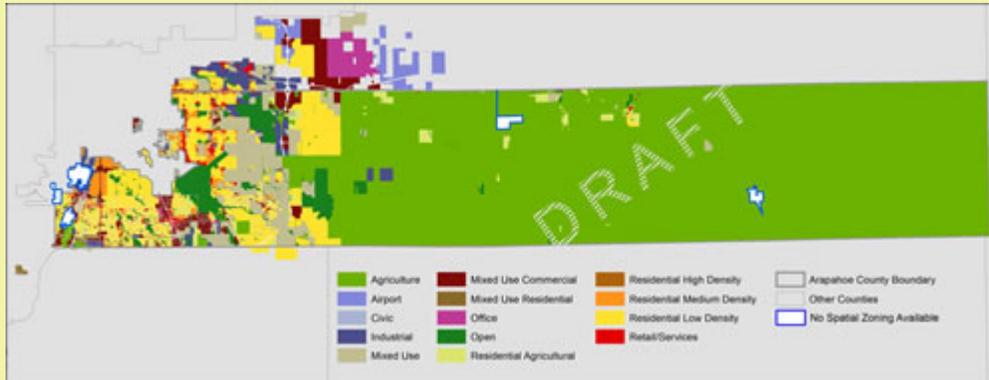
DRCOG is currently working with a consultant to create a regional zoning map. The consultant is compiling and reading the zoning codes for all jurisdictions in the DRCOG region. The goal of this project is two-fold.

First, the consultant will use the information to develop Floor Area Ratios (FAR) for each zoning type. This metric is used in UrbanSim - the DRCOG land use model - for determining where future development can occur.

Second, the consultant is putting together a crosswalk of local codes to a regional classification system. The regional categories are more general and allow us to make a standardized regional zoning map. The following categories are included:

- Agricultural
- Civic
- Industrial
- Mixed Use
- Mixed-Use Commercial
- Mixed-Use Residential
- Office
- Open Space
- Residential Agricultural
- Residential Low
- Residential Medium
- Residential High
- Retail / Services
- Airport
- Utilities

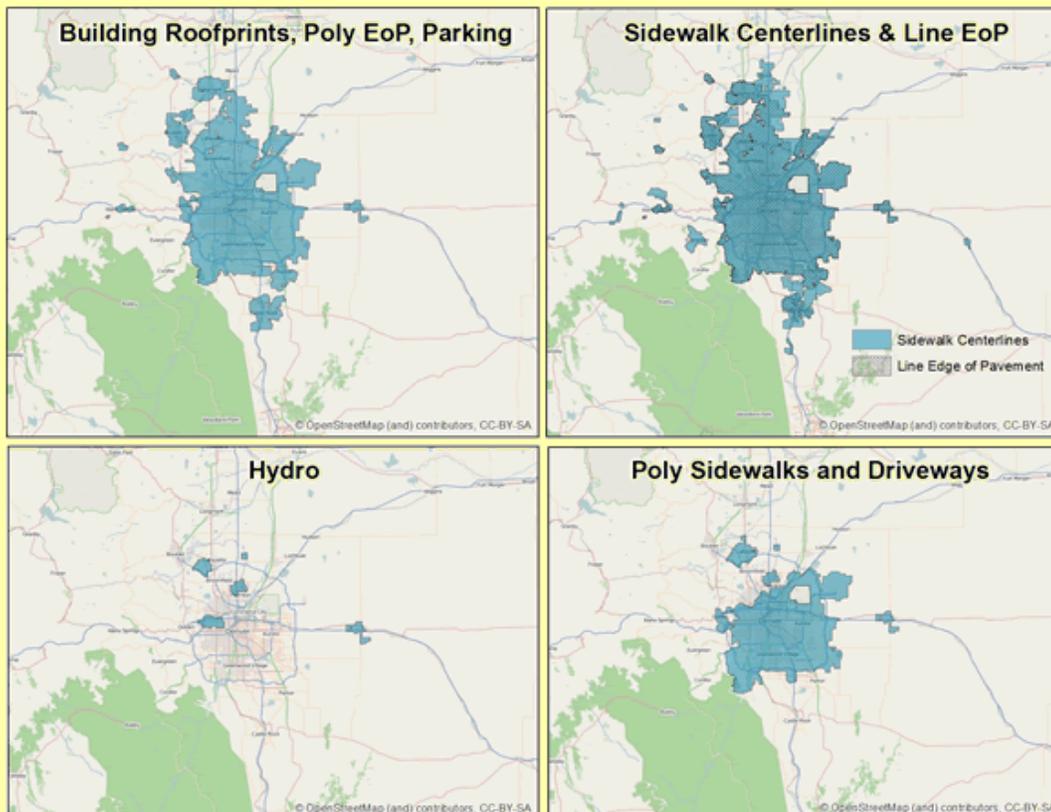
Arapahoe County was the pilot for this project. The draft regional zoning map is shown here. We expect to complete the map for the entire region by August 2015.



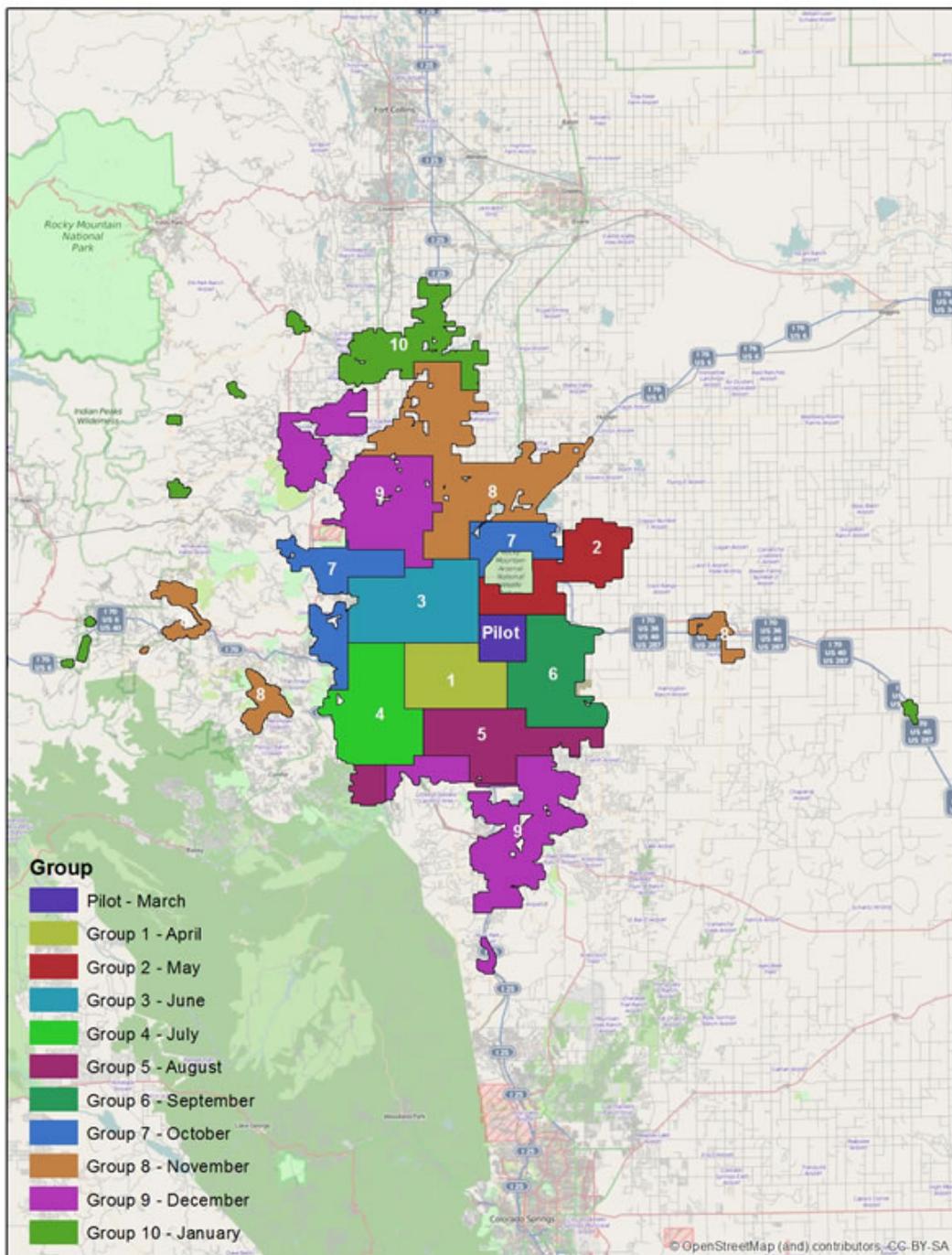
Planimetric Project Update

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

DRCOG is working with 25 regional partners and Kucera International, Inc. to develop regional planimetric data. This project will collect building roofprints, sidewalk centerlines, edge of pavement and other impervious surfaces (e.g. driveways). We are attempting to collect regional coverage for many features, but the area may be adjusted based on contributions from partners (you can still contribute to the project!).



We are excited to announce that this data will be in the public domain and available in the [Regional Data Catalog](#). Deliveries to DRCOG will be progressive and continue throughout 2015. expect to start offering data on our website in May/June.



If you have questions or would like to contribute to this project, please contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

Your Article Goes HERE!

The Data Consortium Newsletter is facilitated by DRCOG but is designed to be written by GIS professionals like you. This quarterly newsletter reaches 175 people on average and has a higher than average "open rate," which shows us that you're interested in the topics showcased here. It's the perfect place to show off your projects, highlight your great work, and contribute ideas to the GIS community in the Denver Region.

The next newsletter goes out in July. Please contact Ashley Summers at 303-480-6746 or asummers@drcog.org by June to contribute.

2015 Data Request and the Data Portal

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

DRCOG sent a data request to member jurisdictions on January 21, 2015 asking for the following nine datasets:

- Open Space
- Zoning
- Employment/Business Data
- Building Permits
- Bikes/Trails
- County and Municipal Boundaries
- Special District Boundaries
- Parcels
- Buildings/Addresses

The 2015 request was unique in three ways. First, we utilized a new application - the Data Portal - for the collection effort. Second, we built a dynamic link to Open Colorado from the Data Portal, incentivizing jurisdictions to make their data free and open to the public. Third, we partnered with the Governor's Office of Information Technology (OIT) to gather and pass along the data that is mutually beneficial to both agencies.

Below is our preliminary report based on the submissions we received by the request deadline (each year some additional datasets are provided after the deadline for various reasons).

- On average, we saw a **24% increase** in the amount of requested data that was submitted, when compared to the response in 2014.
- The vast majority of jurisdictions adopted the Data Portal submission method. The Data Portal currently has **70+** registered users.
- Of the **298** datasets provided in the Data Portal, **234 (79%)** were categorized as "open." **Thirty-one** out of **38** jurisdictions (**82%**) took the initiative to make some or all of their data shareable. This means that DRCOG is not limited to only using this data internally, but may also aggregate it and share it publicly in the Regional Data Catalog. This is great progress towards our goal of more open data in the region!
- Twelve DRCOG member governments contribute to Open Colorado. Two joined the site after we issued our request and five others added to their Open Colorado contributions to accommodate the DRCOG request.
- DRCOG will be passing along over **200** datasets to the Governor's Office of Information Technology. Jurisdictions that allow this pass-through of data only had to respond to the DRCOG request and now do not have to respond to OIT's request.

Overall, we feel that this year's data collection effort and the use of the Data Portal were a great success. Thank you all for your participation and support!

Contour Data Available!

DRCOG is hosting 1ft and 2ft [contour data](#) in the [Regional Data Catalog](#). This data is a result of the LIDAR 2013 project (a partnership between FEMA, USGS, and DRCOG).

If you use the data for a project, we'd be interested in hearing how it worked for you. Please contact us with your story!

GIS in the Rockies Announcement



GIS IN THE ROCKIES REGISTRATION OPEN! EARLY REGISTRATION DISCOUNT AVAILABLE!!

The 28th annual GIS in the Rockies conference returns to The Cable Center in Denver **September 23 & 24, 2015** offering outstanding professional workshops and presentations, networking, exhibitors, job fair, social events and more.

[Discounted early registration](#) is available for **\$250** - a \$75 savings!

CALL FOR PAPERS

GIS in the Rockies invites you to share your professional geospatial knowledge and experience at a conference workshop or technical session. All submissions are welcome - commercial, open source and academic presentations. Questions about GIS in the Rockies? Email chair@gisintherockies.org

Contact Us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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Jan. 15, 2015

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

DRDC 2014 Survey Results

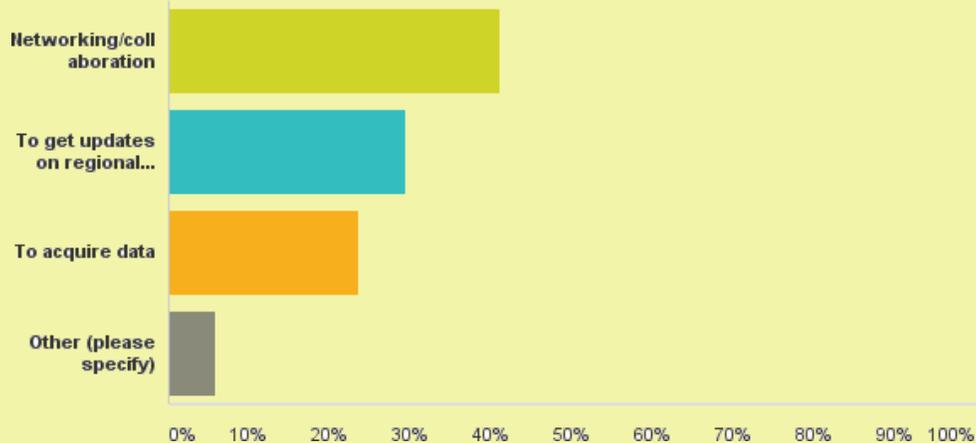
In the last newsletter, we asked you to respond to a survey about the Data Consortium.

The Data Consortium Survey was meant to inform DRCOG about the needs of the GIS professionals from local government in our region. Currently, DRCOG facilitates 2-3 consortium meetings per year and coordinates this quarterly newsletter. The purpose is to help us share information on our work, learn from one another, collaborate on joint projects, network, and brainstorm about innovative ways to use GIS in local and regional government.

We had 17 respondents to the survey (30% of our member governments and 9% of the recipients of this newsletter). The majority (41%) said that the primary reason they participate in the Data Consortium is to collaborate and network.

Q1 What is the primary reason that you participate in the Data Consortium?

Answered: 17 Skipped: 0



The respondents indicated that they would like to see the following topics addressed through the Data Consortium:

- Better data sharing options
- Built environment
- Historical data
- Data standards, accuracy, and completeness
- LIDAR
- Framework layers
- Methods of aggregation used by counties
- Data sharing
- Collaborative efforts

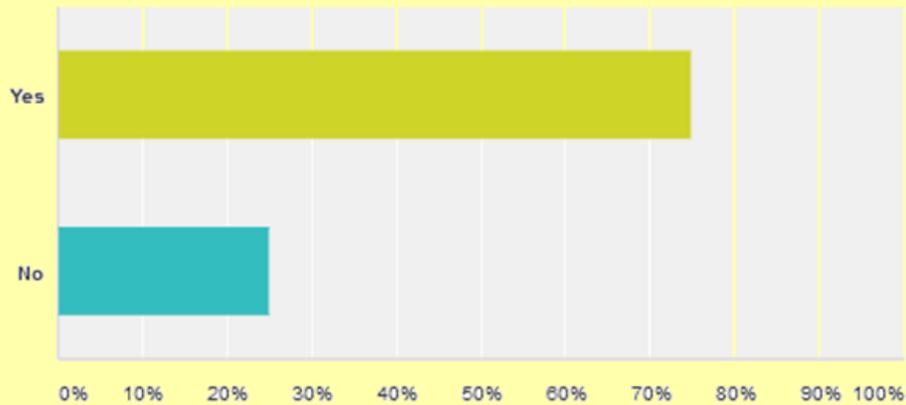
We asked the respondents to indicate the importance of several [regional layers](#). The following is a ranking of those layers:

1. Building Points/Addresses
2. Parcels
3. Jurisdictional Boundaries
4. Land Use
5. Bike Paths/Trails
6. Zoning
7. Building Footprints
8. Open Space
9. UGBA

In terms of data development and distribution, we asked what DRCOG's role should be. In summary, the respondents felt that DRCOG should be a coordinator, facilitator and project manager. DRCOG should continue to determine which data layers are of value to local governments and pursue their development and/or acquisition. DRCOG should serve as a central repository for data as well as serving as the hub for networking and connecting GIS professionals from different agencies. DRCOG should also merge local data into regional datasets as well as creating regional datasets from state and federal sources that local governments could use.

Do you have your own data catalog?

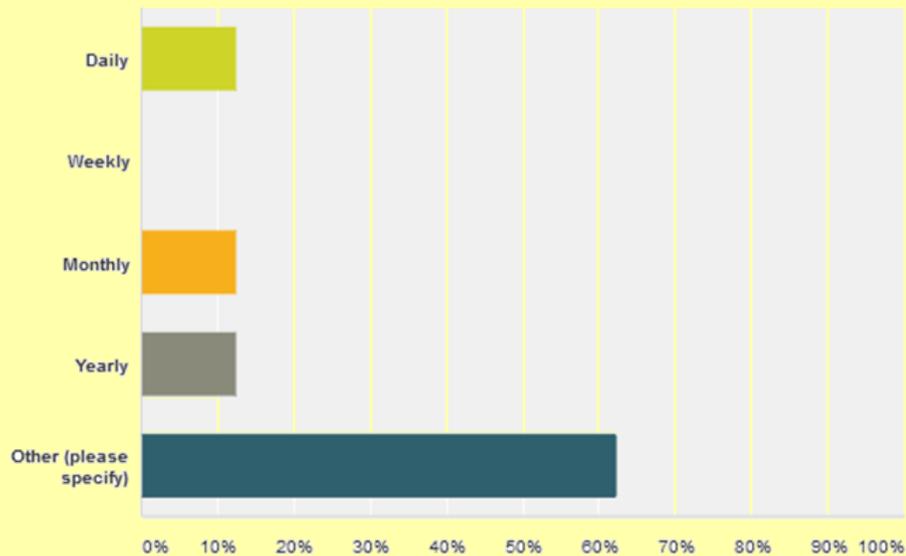
Answered: 8 Skipped: 0



Most of the OpenColorado data partners are sharing data through their own data catalog in addition to publishing to OpenColorado. This creates the dual benefit of providing data where citizens may expect to find it and building a central open data catalog.

How often do you update the data you share on OpenColorado?

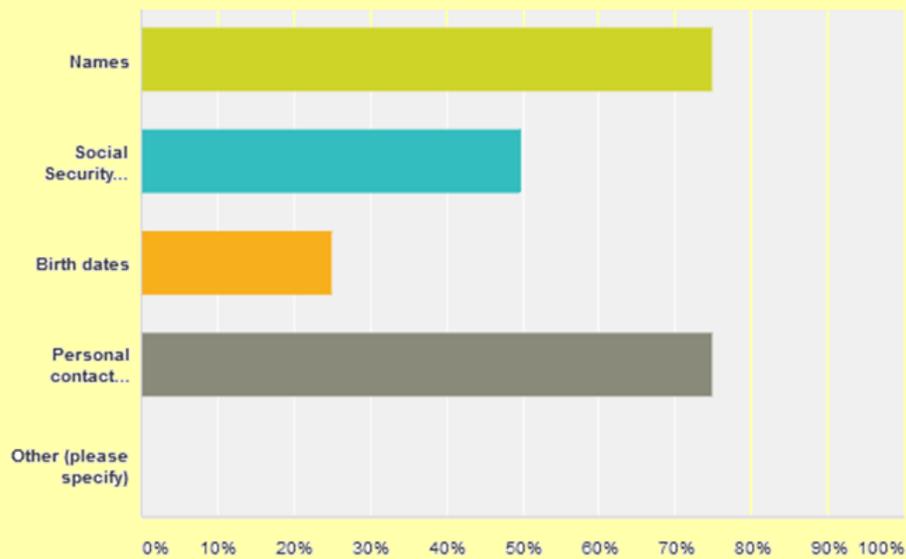
Answered: 8 Skipped: 0



As reported in a recent [Government Technology article](#), updating data is one of the keys to realizing the full benefits of open data. The reasons for not updating data, could include technical challenges, the ease of use of the data platform, and other priorities.

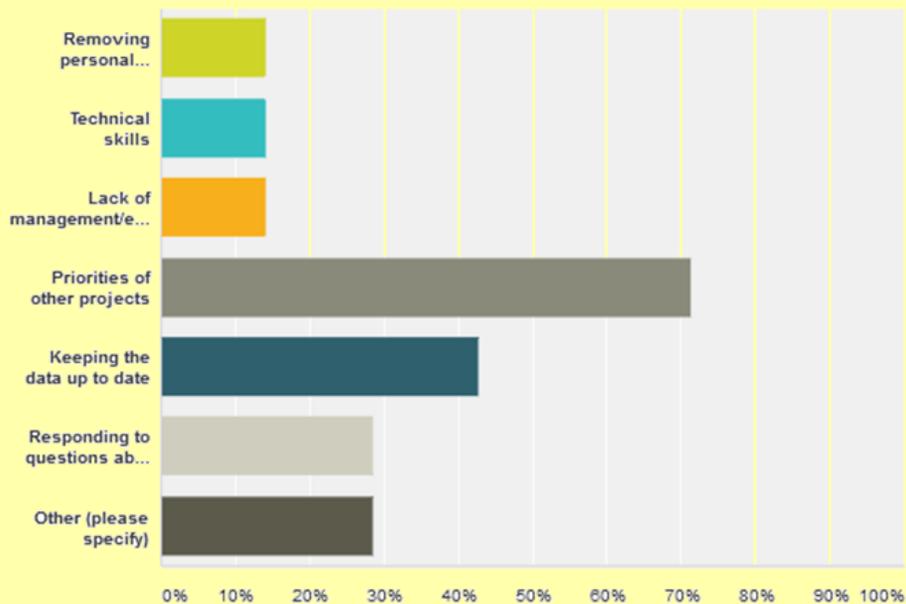
What information, if any, did you have to remove before publishing data sets on OpenColorado?

Answered: 4 Skipped: 4



What challenges have you encountered with publishing data?

Answered: 7 Skipped: 1



In contrast to a [2014 Center for Digital Government](#) survey that said "Open Government /Transparency/Open Data" is the number one priority for city CIOs, OpenColorado's data partners are indicating that the priorities of other projects are still a challenge for publishing and maintaining open data.

Overall, the results of OpenColorado's survey and the growth of the OpenColorado data catalog show that cities and counties are successfully working through the obstacles to open data and continuing to make more data available

Share Your Open Data Story - Take this Survey!

One of the issues that we've consistently struggled with is trying to openly share GIS data amongst government agencies and from government to the public. DRCOG has heard time and time again through our DRDC meetings and surveys that our member governments feel that DRCOG is uniquely positioned to help the region pursue an open data policy.

DRCOG has been researching open data policies across the nation - how they've come about and why they are important. One excellent resource is [MetroGIS](#), a consortium in Minnesota that is similar to the DRDC and that successfully influenced the seven counties in their region to adopt open data sharing policies. One of the critical actions that MetroGIS took to convince their elected officials was to create a [body of research](#) that supported an informed decision on policy adoption. It contained sections on:

- Making Public GIS Data Free & Open: Benefits and Challenges;
- Existing Practice Interviews;
- Public Data Case Law Summaries;
- Statute Language Relevant to Data Availability; and
- Disclaimer Language Samples.

DRCOG would like to follow in their footsteps and use the framework that made them successful. To get started, we are asking for your help to gather information on existing practices regarding data sharing.

This is your chance to influence regional policy. [Take the survey!](#)

Denver Regional Equity Atlas User Stories

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

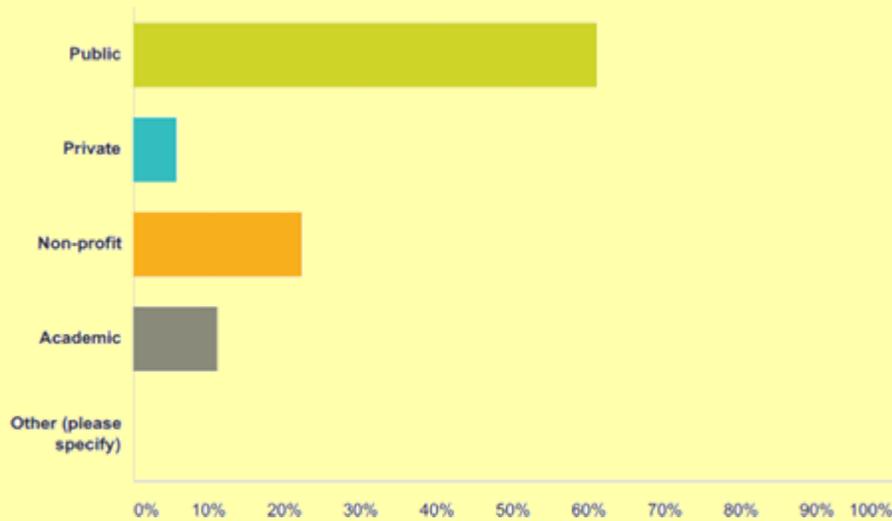
Since the [Denver Regional Equity Atlas \(REA\)](#) launched in February 2014, we have seen it put to good use in a variety of ways. From grant applications to focus groups to blogs about light rail ridership, the REA has proved useful for making a case about access to opportunity in the Denver Metro area.

The site was created through a partnership between DRCOG, Mile High Connects and the Piton Foundation and was funded through the Sustainable Communities Grant. The goal was to take an [existing printed atlas](#) and make it into a dynamic, interactive, online map. The new version of the atlas allows users to make custom maps with a variety of data from five major topic areas including demographics, housing, employment, health, and education. Additionally, the users can drill-down from the regional perspective to a local focus, share and save their maps, and view summary statistics that dynamically update based on the user's areas of interest. The site is publicly accessible and usable without creating an account, however users may register if they wish to save their custom maps for future use.

Since the launch of the REA, we've seen the following activity:

- Over 3,000 users (277 registered)
- Over 17,000 page views
- 120 custom maps that have a geography selected in the charts region
- Over 200 custom maps created by logged in users
- #1 Viewed Map: Concentration of Low Income Households in the Denver Region (313 views)
- #2 Viewed Map: Distribution of Denver Residents who are 55 and Older (155 views)

DRCOG recently surveyed the registered users to find out who is engaging with the site and what they are working on. We found that the majority of registered users work in the public sector, but that the site is also being utilized in the non-profit, academic, and private sectors. Of the respondents to the survey, 44% have been able to use the REA in their work.



Applications of the Regional Equity Atlas include:

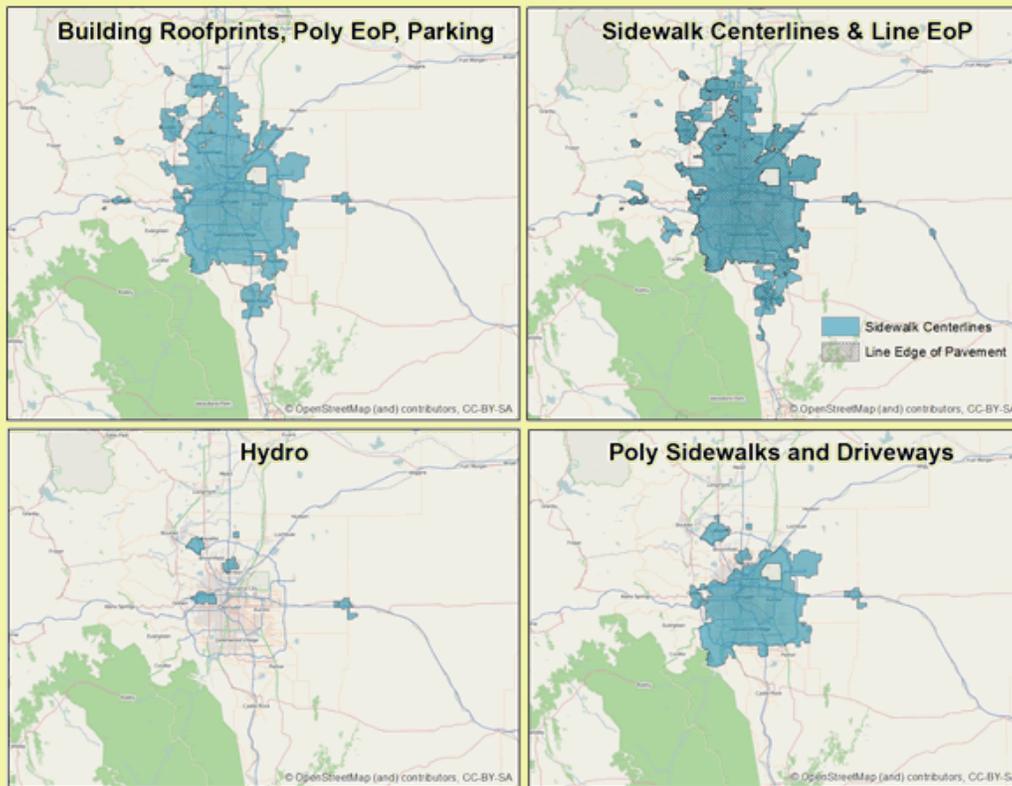
- To help construct a 5-Year Consolidated Plan for the U.S Department of Housing and Urban Development for the City of Aurora;
- To make a case in Sun Valley about how planning can intentionally integrate shared spaces as a way to bring in needed amenities and services;
- To prepare for a focus group with national AARP policy committee for background on areas with high concentrations of 55+ population compared with areas with rent-burdened housing;
- To look at housing density around light rail stations along the West Line compared to the Denver Central Business District. [Read the article here.](#)

Start using the [Regional Equity Atlas](#) today!

DRAPP 2014 & Planimetrics 2015- Project Updates

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

The DRAPP 2014 Project is coming to a close. Deliveries of the final tiled imagery has started and will continue until the end of January. The final data is also being loaded into a WMS for partners to use. For entities that did not participate in this project, the final tiles and WMS will be available for purchase from MapMart in February 2015. Please contact Chris Sheil at csheil@mapmart.com for a quote. After the completion of the DRAPP 2014 project, the imagery acquisition vendor, Kucera International, Inc. will begin work on Planimetric Feature Project. They will be using our 2014 imagery to collect building roofprints, edge of pavement, parking, sidewalks, driveways, and hydro features, as shown in the extent below.



The data will be delivered progressively as it is finished, starting in April 2015 and continuing through the end of the year. All data will be public domain.

This project is being funded by 24 regional partners and DRCOG. **There is still time to participate and contribute funds!** Please call Ashley Summers at 303-480-6746 for more information.

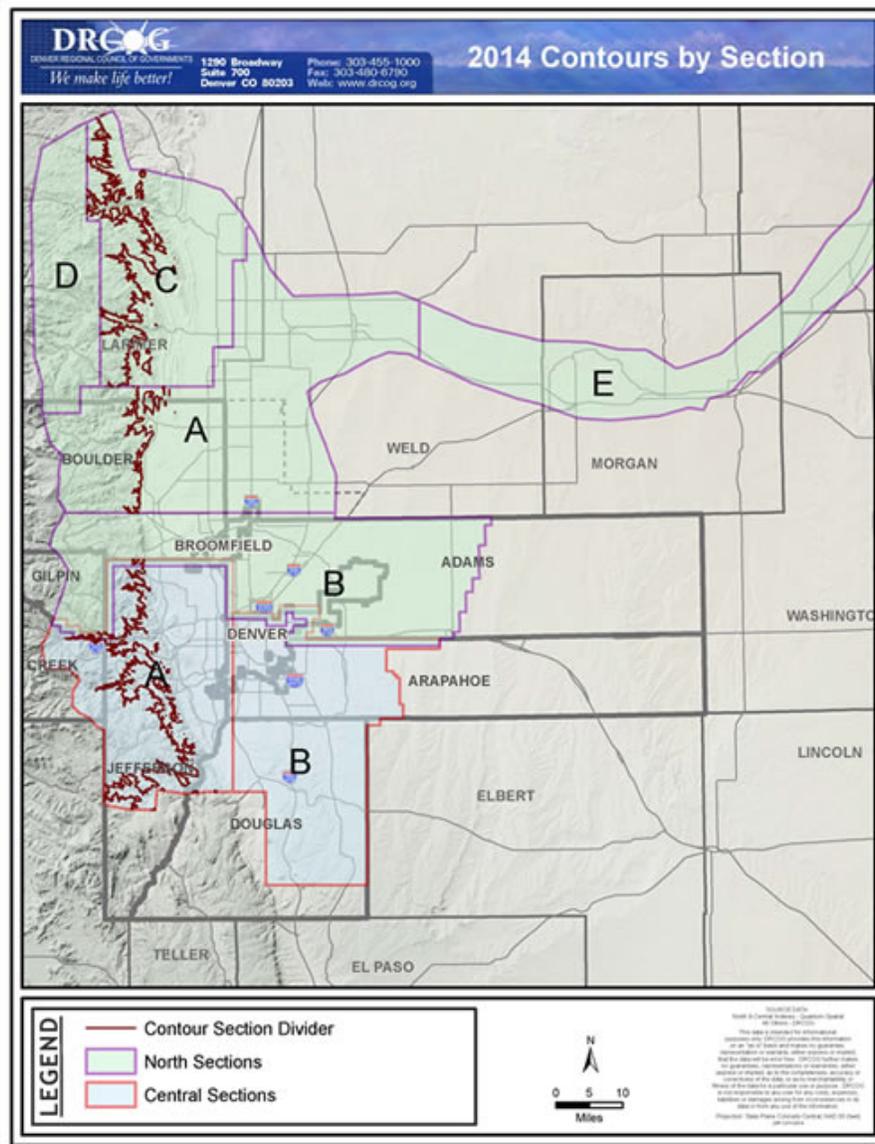
LIDAR & Contour Data Available

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

As mentioned in our October newsletter, the FEMA/USGS LIDAR project that was initiated in the fall of 2013 is finally finished! The data, which includes classified points clouds, a Digital Elevation Model (DEM), and contours, is available for download.

For point clouds, DEMs, and contours (all in UTM)- check the Office of Information Technology's (OIT's) new site, the [Colorado GeoData Cache](#).

For contours (in State Plane) - check out our Regional Data Catalog [insert link]. The data is so large that we've split it up into smaller chunks that are easier to download. Some sections are split by elevation. If you simply merge the "high" and "low" datasets back together after downloading, you will have a full section. Please contact Josh Pendleton at 303-480-6784 or jpendleton@drcog.org if you need assistance.



DRCOG 2015 Call for Data

Article contributed by Ashley Summers, Information Systems Manager at DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org.

DRCOG is about to issue its annual call for data. The request will go out next week and will ask local governments to submit the following datasets to DRCOG via our new Data Portal.

1. Open Space
2. Zoning
3. Employment/Business Data
4. Building Permits
5. Bikes/Trails
6. County and Muni Boundaries
7. Parcels
8. Buildings/Addresses
9. Special Districts

How does DRCOG use local government data?

DRCOG uses data collected from its members to create regional datasets for planning, forecasting, and modeling regional transportation and development. For example, local data feeds UrbanSim (a land use model) and FOCUS (a transportation model) to create more accurate predictions for the future. We also use local data during Metro Vision scenario planning, DRAPP planning and TIP evaluations. A few illustrations of these processes can be found [here](#).

Whenever possible, DRCOG compiles local data into publicly shareable regional datasets and makes them available on the DRCOG Regional Data Catalog. Currently, we provide [Regional Open Space](#), [County](#) and [Municipal Boundaries](#) and [Regional Bike Inventory](#) as a free download.

How should local governments submit their data?

DRCOG recently built a new, online application called the Data Portal for data exchange with local governments. The Data Portal requires a login. If you have not had the opportunity to attend a workshop or webinar and do not yet have a login, please contact Jenny Todd at jtodd@drcog.org.

New in the Regional Data Catalog

- [Origin-Destination Data from the Census](#) (where people live and travel to everyday)
- [Residence Area Characteristics](#)
- [Workplace Area Characteristics](#)
- Data from Colorado Homeland Security North Central Region (NCR) GIS Data Repository

[Schools](#)
[School Districts](#)
[Railroads](#)
[Roads](#)
[Water Bodies](#)
[Rivers](#)
[Addresses](#)
[Trails](#)

Articles and Videos

- [Webinar: The Value of Effective Data Construction for Rural Communities](#)
- [What Counts: Harnessing Data for America's Communities](#)

"Successful community building requires many elements—a clear understanding of needs and opportunities, engagement of residents, support from all levels of government, collaboration among people and across programs. It also requires knowledge of what is happening in real time, whether strategies are working and how they can be improved. Building on the message of integrated, collaborative community development in Investing in What Works for America's Communities, the current volume, **What Counts: Harnessing Data for America's Communities helps us understand how to efficiently turn the volumes of data now available into the information needed to achieve the results communities want.**"- Melody Barnes, CEO, Melody Barnes Solutions, and former Director, White House Domestic Policy Council

- [White House Launches Open Data Disaster Portal](#)
- [Open Data Visualization Tool Challenges Traditional GIS](#)

- [Open Data: What Is It and Why Should You Care?](#)
- [CDOT opens bike map access to local agencies](#)
- Thoughts on the GeCo in the Rockies Conference 2014:

<http://www.webmapsolutions.com/thoughts-geco-conference-gis-industrysplitting>
<http://www.webmapsolutions.com/is-gis-splitting-what-the-experts-think>

Contact Us

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Oct. 15, 2014

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[FOSS4G Recap](#)

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Data Portal Update

Article provided by Jenny Todd, Senior GIS Specialist, DRCOG. Jenny can be reached at 303-480-6754 or jtodd@drcog.org.

DRCOG has completed development of its new Data Portal, a login-only site for secure data exchange between DRCOG and its members. When DRCOG makes future requests for data, the Data Portal will be used to transmit that data. Similarly, DRCOG will load data onto the site for members to download. The application uses the CKAN platform, which is an open source data management system. Open Colorado uses CKAN as well, so the Data Portal can pull data available in Open Colorado. The Data Portal will allow for more efficient, secure, and consistent exchange of data. Some benefits of using the Data Portal include:



- Communicate using Disqus threads
- License agreements loaded with data

- Transaction logging
- DRCOG data will be distributed through site

This fall, DRCOG will be holding two Data Portal training workshops for members **Thursday, Oct. 30** and **Wednesday, Nov. 5, from 9 a.m. to noon** at the Center for Advanced Visualization and Experiential Analysis (CAVEA) on the Metropolitan State University Campus. These workshops will provide instruction on using the Data Portal, including setting up administrators and users on the site, adding data, downloading data, and communicating using Disqus threads. GIS staff at our member jurisdictions were sent invitations to attend. If you have not received this invitation, please contact Jenny Todd-RSVPs are requested by **Oct. 24**

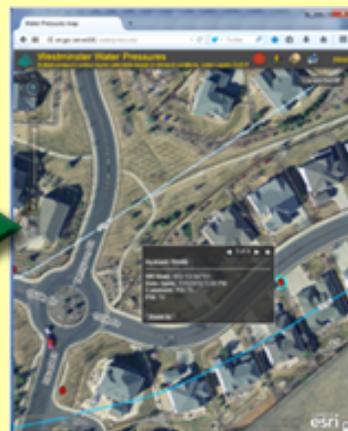
Making GIS Accessible to Non-GIS Professionals

Article provided by Bill Jeffrey, City of Westminster. Bill can be reached at wjeffrey@CityofWestminster.us.

While GIS professionals tend to have a combination of experience and education that makes the basics of GIS seem like self-evident facts, most casual GIS users in an organization probably find it quite daunting. Anyone who has ever tried to walk a first-time user through an ArcMap session knows that a typical response sounds something like "why is it so complex?" In some cases the GIS professional's wealth of knowledge can work against them, as they have forgotten the "beginner's mind" of first delving into this field. Because of this, it can be hard to make GIS accessible.

A GIS professional may work with dozens of customers within their organization, all with vastly different conceptions of what GIS is and how it should function. This poses a real challenge since we want to continue creating powerful and often complex analytical tools, while also being stewards of accessible spatial information.

GIS tools often spread in an organization from the bottom up, so working closely with end users is critical. Being an evangelist for geographic technology and trumpeting success stories can help to spread the word. Sometimes what a seasoned GIS pro assumes is needed may actually miss the mark of what a field or office user may consider of primary importance. Getting to know their needs is key.



Move continuously to new solutions, but don't neglect to understand your users' culture, where they are coming from, and what is already a part of their workflow.

When looking at tools, there are usually many different ways to achieve the same result. Generally, the simpler the better. When approaching flashy new tools with

exciting new APIs, it is easy to get caught up in details that may not really matter in the end. To the end user, it just needs to work!

In order to keep users informed of the current possibilities of your system, it is important to create and maintain an ongoing training curriculum. To be successful, outreach and educational programs should be frequent and timely, be comprised of succinct classes, and focused to the audience. It can also be helpful to have material available outside formal classes, ideally in the form of a FAQ or wiki.

Finally, systems integration is key to making GIS accessible. To a novice user, having GIS, asset management, document management, or other systems as separate tools just seems wrong. They do, after all, refer to the same objects on the ground. Working to allow these systems to talk to one another has far-reaching benefits across the organization.

State Geographic Data Coordination Activities

Article provided by Jon Gottsegen, State GIS Coordinator, OIT. Jon can be reached at 303-764-7712 or jon.gottsegen@state.co.us.

The Governor's Office of Information Technology (OIT) is statutorily mandated to coordinate geographic information and technologies across the state. A significant component is providing a clearinghouse of geographic information for GIS users to find and access geographic information easily. Another component is stewardship or

active management of statewide data for important or statewide data sets. OIT also coordinates communication of activities among local and state agencies to foster possible collaboration or cost sharing in these efforts. OIT has been developing a capability for discovering and accessing geographic data over the last few years and has several modes available for delivering these data to interested users. The catastrophic flooding last fall emphasized the need to share GIS data easily, so OIT is continuing to develop these tools. This article describes the data discovery and access efforts in OIT. It will be clear that these efforts mirror those of DRCOG, so OIT and DRCOG are communicating regularly to identify possible areas of overlap or cooperation.

The most important step in making data available and used in the state is making sure the data are discoverable. In other words, what is available, where is it and how does a potential user obtain it? OIT's solution for this is the Colorado Information Marketplace (CIM), found at data.colorado.gov. This software as a service site is the state's site for data transparency. It allows for uploading of data and interaction with the data in the form of graphs, filters and maps on Google's base map. It is OIT's intent to use data.colorado.gov as the primary place to discover available data from state government in Colorado.

Once data are discoverable, the next step is ensuring that the data are accessible through various modes. OIT has developed several mechanisms for this. OIT has implemented two File Transfer Protocol (FTP) instances should a user be interested in downloading data for use locally: one for public data not requiring any security (<ftp://gisftp02.state.co.us>) and one, known as the CO State GeoShare, which is secured for restricted data (<https://gisftp02.state.co.us>).



OIT has also implemented a map-based application, the Colorado GeoData Cache (<https://geodata.co.gov>), to find and download data sets such as LiDAR or imagery. This application resulted from coordination of participation in a LiDAR flight after the catastrophic flooding last fall. However, it is proving useful for other data as well. This site is built on open source software, and it allows users to zoom in on an area of interest and obtain the data in that area. This is important for data like LiDAR or imagery because they are often organized into multiple tiles, and it is often difficult to know which particular tiles are of interest.

As OIT matures its technologies and procedures for making data available, we will work to make the full range of state-owned data transparent and usable. We will continue to work with DRCOG and other local and regional governments to support the most effective way for exposing data they wish to be available as well. We look forward to this ongoing partnership. For additional information, please contact Jon Gottsegen, State GIS Coordinator (jon.gottsegen@state.co.us).

DRAPP Update & Related Projects

Article provided by Ashley Summers, Information Systems Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcoq.org.

The Denver Regional Aerial Photography Project completed its 2014 flights over the summer. All 7,000 square miles of the imagery is currently being processed to meet stringent quality standards. Throughout the fall, the final imagery will be checked by an independent quality control vendor before being accepted. The project is still on schedule to deliver final imagery to partners in December 2014. For entities that did not participate in this project, the final tiles and WMS will be available for purchase from MapMart in January 2015.

In related news, the FEMA/USGS LIDAR project that was initiated in the fall of 2013 is finally finished! The data, which includes classified points clouds, a Digital Evaluation Model (DEM), and contours, is being distributed to DRCOG partners this month. Within weeks, the public can expect to find this data available for download on Office of Information Technology's (OIT's) new site, the [Colorado GeoData Cache](#).

Also of interest is that the DRAPP consortium is still pursuing a planimetrics project to follow the successful completion of DRAPP 2014. The current plan includes the joint purchase of building footprints, edge of pavement, parking, sidewalks, driveways, and hydro features for much of the region. Board approval for this project will be sought in November. For more information on this initiative, contact Ashley Summers at 303-480-6746 or asummers@drcoq.org.

DRDC Survey

Take our [Data Consortium Survey](#) so we can learn how to better serve you!

**Data Consortium
Survey**

The Colorado Open Data Ecosystem

Article provided by Scott Primeau, President, OpenColorado. Scott can be reached at 303-877-0009 or scott.primeau@opencolorado.org.

Colorado's open data offerings have been growing steadily over the past four years and are on track for even bigger growth in the near future. This open data and civic innovation growth has come through several nonprofit, government, quasi-government, and citizen-led efforts.

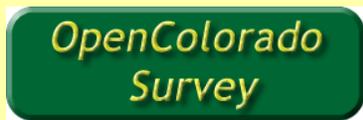
For example, OpenColorado, data.opencolorado.org, provides a free, self-service open data platform that allows cities, counties, and other organizations to publish data sets in a central location.

While several organizations are building open data platforms and services, the goals of the different groups are very much aligned—promote transparency, improve government services, collaborate with citizens, and build better communities. The following graphic illustrates Colorado's open data offerings and community building efforts.



Colorado's open data organizations have made very good progress on transparency and citizen collaboration, but there is still more work to do. More jurisdictions need to share data. Governments and other open data providers need to give more support to their user communities. We need to continue building a unified open data offering.

OpenColorado is also interested in hearing from our users. We would appreciate any feedback you may have on the OpenColorado data catalog:



New Technologies Unveiled at ESRI UC

Article contributed by Todd Bless, GIS Specialist, DRCOG. Todd can be reached at 303-480-6797 or tblees@drcog.org.

The annual Users Conference held by ESRI in San Diego is always a showcase for their newest ideas and products. This year two of the biggest new products that they showed off to their customers were ArcGIS Pro and Web AppBuilder for ArcGIS. Both are expected to be released in Q4 this year, although beta versions are available now for those eager to dive in.

ArcGIS Pro is the product that has been receiving the most attention as it's going to bring a new, modern suite of mapping and analysis tools to GIS professionals. First things first, ArcGIS Pro is not ArcGIS Desktop: these are companion programs that can be run at the same time. ArcGIS Pro will be made available to those organizations that are current on maintenance.

One thing that organizations with newer hardware should appreciate about ArcGIS Pro is its speed. Pro will be a native 64-bit application to take better advantage of newer computers. It will also have a more contemporary look than ArcGIS for Desktop. The ribbon interface that is now seen in many newer applications will be present in Pro as well. This should make customization of the interface a bit easier than what we have been used to with toolbars. Another major feature that has been on the wishlist for many of us for a long time is the ability to save multiple layouts in the same project.

One change with ArcGIS Pro, which may be seen as a negative or positive depending upon your viewpoint, is the introduction of Python 3.4 as the standard development language. ArcGIS Desktop has used Python 2.x and this will continue as 10.3 will ship with Python 2.7. Two different versions of Python will be necessary if you wish to develop with both software packages on the same machine.

Not as widely publicized but potentially more important for some organizations is the Web AppBuilder for ArcGIS. As web applications become increasingly important in GIS, programming skills have also become increasingly important to support these applications. The need for those skills is unlikely to go away anytime soon, but Web AppBuilder promises the ability to create fully functional applications that can be used on any device without writing any code. It will allow numerous customizations in themes and appearance and will include widgets which can be plugged in to support specific functionality such as scale bars and geocoders. ESRI is also encouraging the creation of custom widgets which can be shared among the GIS community to meet specific needs.

With these new technologies and more to come, the end of the year has the potential to be an exciting time for ESRI users.

Why did I attend a Free and Open Source Software for Geospatial (FOSS4G) conference this year?

Article contributed by Dave Murray, GIS Coordinator, City of Westminster. Dave can be reached at dmurray@cityofwestminster.us or call me at 303-658-2014.

Other than the fact that the conference was located in beautiful Portland, Oregon in the fall, this is the question that I asked myself before I completed my registration and booked my flight. Since the City of Westminster has a full suite of commercial off the shelf (COTS) GIS software, what did I think I would learn? Well, it was quite surprising and can be summed up in one word: "integration." My goal was to see what capabilities were available in the open source GIS world and see if it would make sense to begin integrating them into our current GIS practices. Other attendees who have mature FOSS4G implementations may be interested in talking and learning from the individuals who work with and create the software.

I attended several presentations that spoke directly to my question. The open source community has realized that organizations will not scrap their existing systems just to move to a platform that doesn't charge a licensing fee. The hybrid mode of the best offerings from commercial and open source has made sense for a number of organizations. Included in these are Charlotte, North Carolina, the State of Wyoming, and the Portland Regional Council among others.

I have no illusions as to how difficult this will be. There are many impediments to bringing in new ways of managing and using GIS data. But what I saw at the FOSS4G conference in Portland, Oregon gave me hope that the open source community understands my needs and will work with us to provide solutions to our geospatial problems. If you would like to discuss this topic, please e-mail me at dmurray@cityofwestminster.us or call me at 303-658-2014.

You can find talks from the conference here: <https://2014.foss4g.org/live/>.

Upcoming Events

- [GIS Colorado Fall Meeting](#) - **October 24th**
- [GIS Day](#) - **November 19th**

Contact Us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcoq.org

Disclaimer: The information provided in this newsletter is compiled from multiple sources and is intended for informational purposes only. DRCOG assumes no responsibility or legal liability for the accuracy, completeness or usefulness of any information in this newsletter.

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July 15, 2014

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

[Progress Report on the DRCOG Data Portal](#)

Article provided by Jenny Todd, Senior GIS Specialist, DRCOG. Jenny can be reached at 303-480-6754 or jtodd@drcog.org.

In the April, 2014, edition of the Data Consortium Newsletter, we introduced the Data Portal project. The Portal is an online application for data exchange between DRCOG and its members. It will replace the former data collection process of using the ftp site or email communication. The Data Portal will allow for more efficient, secure, and consistent exchange of data. Some of the advantages of using the Data Portal include:

- Secure site for data sharing
- Reduced errors in data transmissions
- Increased communication between DRCOG and its members
- Storing of data license agreements
- Transaction logging

Beta testing of the Data Portal is now underway! This is an important step in the project as it gives the DRCOG team a chance to address user questions or concerns.

Thank you to the following organizations who have volunteered to participate in beta testing of the Data Portal:

- Aurora
- Boulder County
- Commerce City
- Federal Heights
- Firestone
- Colorado State Office of Information Technology
- Thornton



If you would like to participate as a beta tester, it is not too late! Please email asummers@drcog.org if you are interested. If you want to learn more or have questions, consider attending the GoToMeeting conference call scheduled **Tuesday, July 22 from 10 - 11 a.m.** The details are listed below:

1. Please join the meeting.
<https://www3.gotomeeting.com/join/458483742>
2. Use your microphone and speakers (VoIP) - a headset is recommended. Or, call in using your telephone.
Dial +1 (312) 757-3131
Access Code: 458-483-742
Audio PIN: Shown after joining the meeting
Meeting ID: 458-483-742

In the fall, DRCOG will schedule several workshops for its members. These workshops will provide instructions on using the Data Portal, including setting up administrators and users on the site.

DRCOG Shares Regional Business and Residential Datasets

In June of 2014, DRCOG purchased business and residential data from InfoGroup (formerly InfoUSA) to supplement existing built environment data that feeds the UrbanSim Land Use Model. During the purchase, DRCOG negotiated a deal with InfoGroup that allows sharing these datasets with DRCOG member governments and select partners.

The Infogroup business and residential data are valued at \$28,000, but offered to DRCOG members and approved partners at no cost.

Attributes include, but are not limited to:

Business: Company name, address, number of employees, work at home information, modeled square footage

Residential: address, demographics, own vs. rent info, sale date, sell price, year built, square footage

This data covers the entire DRCOG region, has been geocoded, and is accurate for 2014. A 2000 and 2005 historical business dataset is also available free of charge. To obtain this data, your organization will need to sign a license agreement. All data will be distributed through the new DRCOG Data Portal.

For access, please contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

To read more about InfoGroup, see its [white paper](#).

DRAPP Update and Related Projects

The Denver Regional Aerial Photography Project has completed its 2014 flights. The summer acquisition was particularly challenging this year because of late, slow-melting snow events and overcast afternoons that shortened our daily flight windows. The flight crews prevailed and all the imagery is now undergoing processing. The flights that were completed in the spring are available to DRAPP partners in their interim form (i.e. not orthorectified or color-balanced) in a WMS hosted by MapMart Cloud. The project is still on schedule to deliver final imagery to partners in December 2014. For entities that did not participate in this project, the final tiles and WMS will be available for purchase from MapMart in January 2015.

In related news, the FEMA/USGS LIDAR project that was initiated in the fall of 2013 is progressing well and the data is already being used to orthorectify the 2014 DRAPP imagery. The data, which includes classified points clouds, a Digital Evaluation Model (DEM), and contours, has been delivered to USGS for QAQC. DRCOG partners are expecting to see the final deliverables in August/September. Shortly thereafter, the public can expect to find some or all of this data for download on Office of Information Technology (OIT's) new site, the [Colorado GeoData Cache](#).

Also of interest is that the DRAPP consortium has recently starting considering a planimetrics project to follow the successful completion of DRAPP 2014. The scope is still evolving, but current discussions include the potential joint purchase of building footprints, edge of pavement, parking, sidewalks, driveways, and hydro features for much of the region. For more information on how to partner with DRCOG on this potential initiative, contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

How Does Local Data Drive Regional Decision Making?

On June 25, DRCOG GIS Manager Ashley Summers gave a presentation to the DRCOG Board explaining how local data becomes information that drives regional decision-making. The purpose of this informational talk was to bring awareness to the state of DRCOG's data at a regional and local level, to outline why we often struggle with collection and compilation, and to show how data affects the analysis, forecasting, and planning efforts that inform influential decisions.

Elected officials need answers to many questions when they collaborate and negotiate at the DRCOG table. Questions like, "How is the region doing on our Metro Vision goals?" or "How do jurisdictions contribute to those goals at a local level?" or "Where does the region need to focus energy to make improvements?" The answers lie in current, accurate, and consistent information - information synthesized from detailed local data and compiled into a big-picture regional look.

To better understand the process, let's look at two of the datasets DRCOG collects from jurisdictions: land use and zoning. The data is quite different across the region, so DRCOG finds commonalities and standardizes them into a dataset that can be used to draw broader conclusions on a regional scale. Once it's been compiled, the data is fed into UrbanSim, DRCOG's land use model, which not only leads to Small Area Forecasts, but also produces an output that goes into the DRCOG's travel model and air quality conformity model. Each model result is contingent on the one before it and directly tied to the quality of the source data, which begins at the local level.

Check Out More Data Processes [Here](#):

- Land Use and Zoning
- Bikes and Trails
- Buildings

- Open Space
- Parcels and UGB/A

DRCOG reaches out to jurisdiction staff throughout the year for data. The DRCOG GIS Team initiated a data collection effort in January 2014 to acquire geospatial data from the region's local governments. Specifically, the 10 datasets requested were:

- municipal and county boundaries,
- parcels,
- open space,
- trails,
- bike facilities,
- buildings,
- land use,
- zoning, and
- urban growth boundary/area (UGB/A).

DRCOG staff would like to see improvement in the submission of buildings, land use, bike and trails, and UGB/A. The goal is also to make requests routine so the response is closer to the deadline. Finally, a consistent way to mine the data of jurisdictions without GIS is needed.

The presentation included these statistics and made suggestions regarding how improve the responses to the data collection effort.

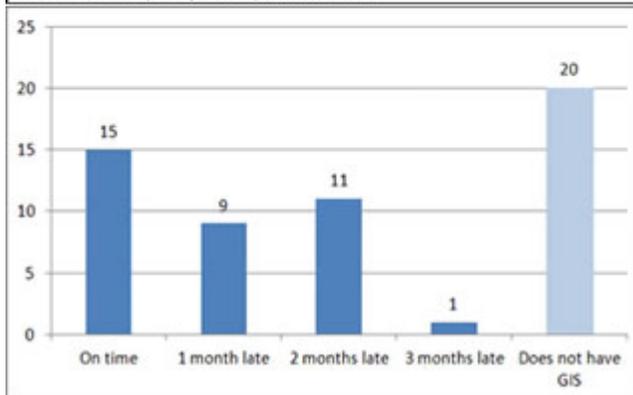
DRCOG suggested that elected officials and other members of a jurisdiction's leadership team investigate options to set us up for success. For example, getting more staff, more technical resources, or allowing more time to be spent where needed. **Local staff must be enabled and supported to get this job done.**

Dataset	% Received	% Not Available	% Missing
County Boundaries	100%	0%	0%
Parcels (from Counties)	100%	0%	0%
Municipal Boundaries	79%	8%	13%
Zoning	90%	5%	5%
Trails	72%	21%	8%
Open Space	74%	15%	10%
Buildings	51%	38%	10%
Land Use	62%	21%	18%
Bike Facilities	28%	13%	59%
UGBA	41%	8%	51%

These percentages are based on GIS - enabled jurisdictions only. Members without GIS capabilities were not included in this analysis.
 % Received = Number of datasets we received divided the number of jurisdictions that are gis-enabled and expected to respond.
 % Not Available = Though the data collection process, we learned that this percentage of gis-enabled jurisdictions do not maintain this information.
 % Missing = The percentage of jurisdictions that may have the data but didn't provide it and didn't tell us explicitly that they don't maintain it.

The "takeaways" shared with the Board were simple and to the point:

- The best and most detailed data is at the local level. You are the experts;
- DRCOG is here to help, committed to continuously improving the information it provides; and
- A call to action: Let's make an investment in building a strong foundation together.



Regional Open Space Data Now Available in the Regional Data Catalog

In 2012, DRCOG began creating a new open space layer with the Common Spaces Data Consortium subcommittee. From this subcommittee and its Data Dash in September 2012, parks and open space data was obtained from several cities and counties as well as Colorado State Parks and the South Suburban Parks and Recreation District. This data was combined with DRCOG's original open space layer, Greenprint and COMap data and clipped at the county level. The data was then compared with parcel data and aerial photography to resolve discrepancies between datasets to ensure recent land use changes had not changed the nature of areas identified.

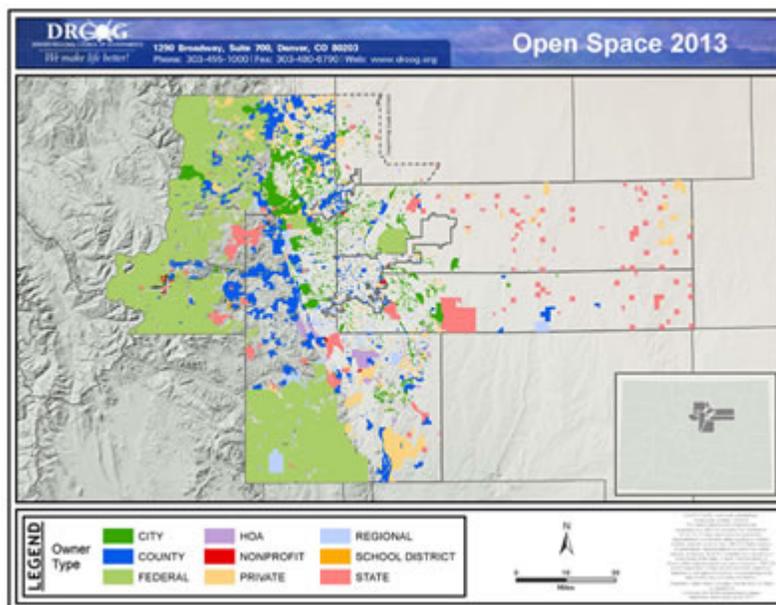
Open space data was included as part of DRCOG's data request to local governments in early 2014. With this request, a large number of new and updated local open space datasets were incorporated into the open space layer. Some proprietary data obtained from COMap was removed. This made it possible to make the data available to DRCOG members and the general public.

DRCOG is creating the open space layer primarily to meet in-house business needs such as Metro Vision and model development. Because of these needs, not all data considered open space by local jurisdictions is incorporated into the layer. For example, trails are excluded from the open space layer because those features are maintained in a different dataset. Thin strips of planned green areas, such as medians and street right-of-ways, are also excluded from the layer. Lastly, drainage ditches and ponds are omitted unless they have recreational value beyond water retention. In general, an area of land needs to be developable to qualify for the layer.

Thank you for all of the data you have provided to assist in the creation of this data. Updates are ongoing, so if you find any parks or open areas that have been missed, please feel contact DRCOG to make the data as accurate as possible. Data collected will also be used as part of DRCOG's annual data request to make annual updates.

Download the data from the [Regional Data Catalog](#)

Download the map from [Map Gallery](#)



[Neighborhood Delineation Tool](#)

Article provided by Jennifer Newcomer, Director of Research, The Piton Foundation. Jennifer can be reached at 303-825-6246 or jnewcomer@piton.org.

The Piton Foundation's Data Initiative has a deep understanding of issues facing

lower-income communities. Established in 1991, the Data Initiative has been a leader in Colorado for analyzing and sharing data to improve community decision-making. It is a go-to source for comprehensive, accurate and easy-to-access neighborhood-level data.

In response to changing demographics and economic conditions in metro Denver, the Data Initiative is shifting its focus from a historically Denver-centric one to a 7-county regional view. The first web-based application that will be created with this expanded geographic reach is an updated Community Facts tool, which will offer free, neighborhood-level data.

As part of the Community Facts update, the Data Initiative is developing a classification scheme that will delineate neighborhoods for the entire metro region. The Data Initiative created a [mapping tool](#) that allows residents and community members to provide feedback on draft neighborhood boundaries that have been identified. Through this tool, you can create a neighborhood map that will help the Data Initiative refine its delineation results. **The deadline for providing feedback is September 19, 2014.**

If you have questions about the mapping tool, or would like to receive regular updates on the new Community Facts tool's development, please contact Piton's director of research, [Jennifer Newcomer](#).

Articles of Interest

[The Twin Cities region did some research on free and open data. On October 23, 2013, the MetroGIS Policy Board adopted a Resolution of Support for Free and Open Public Geospatial Data and are advancing their recommendation and supporting research to the governments in the Seven County Metropolitan region.](#)

[The Open Data 500 is the first comprehensive study of U.S. companies that use open government data to generate new business and develop new products and services.](#)

[Building a Government Data Culture](#)

[Check out this Interactive Webmap Showing Open Data Policy Adoption in the Nation](#)

Upcoming Events

- Geospatial Conference in the Rockies (GeCo in the Rockies) is a joint conference between GIS in the Rockies and GeCo West, sponsored by GIS Colorado. [GeCo in the Rockies 2014](#) - September 22-26 - Register now!
- DRCOG Idea Exchange - August 21 - Stay tuned for an invite to this event. Typically, the DRCOG planning team hosts these meetings to get feedback from planners on a variety of Metro Vision topics. For this meeting, we will be focusing on data. A preliminary agenda includes: an overview of how DRCOG uses local data for analysis, a Data Portal demo, a Regional Equity Atlas demo, an intro to The Piton Foundation's Community Facts Tool, and a look at neighborhood delineations throughout the region.

Highlights

- DRCOG Website Gets a Makeover. Check it out [here!](#)
- Check out the region's progress on our Metro Vision Goals [here!](#)

Contact Us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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April 15, 2014

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

DRCOG Begins Development of Data Portal

Article provided by Ashley Summers, GIS Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org

In January, DRCOG made a request to members for data. It was our largest such request to date, consolidating requests from across the agency. We asked for all types of data, from jurisdictional boundaries to parcels to land use to bike facilities, among others. During this effort, we noted many areas where improvements could be made, such as

- Duplicate requests to jurisdictions due to the size of our contact list;
- Submission process complicated by varied methods (e.g. email, FTP, snail mail);
- Manual submission tracking, leaving lots of room for error.

To address these issues, DRCOG recently began developing the Data Portal - an online application for data exchange between DRCOG and its members that makes data collection and distribution easier for everyone. The site is planned to:

- Be a "one-stop shop" for uploading and downloading data from DRCOG;
- Be a secure site that allows transfer of non-public data;
- Provide one profile per member with multiple, individual logins;

- Track all transactions of data and supporting files;
- Track all data agreements/restrictions so you can verify what we have on file.

DRCOG uses this data collected from its members to create regional datasets for planning, forecasting, and modeling regional transportation and development. For example, local data feeds UrbanSim (a land use model) and FOCUS (a transportation model) to create more accurate predictions for the future. We also use local data during Metro Vision scenario planning and DRAPP planning.

We are planning a beta launch this spring/summer. If you would like to be a beta tester, please email asummers@drcog.org.

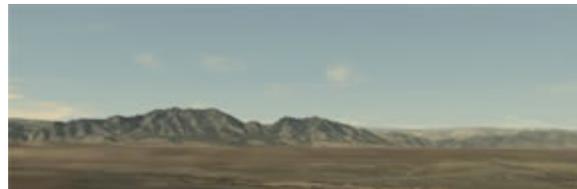
The Town of Superior's Virtual Review Process

Article provided by Lisa Ritchie, Management Analyst, Town of Superior. Lisa can be reached at 303-499-3675, extension 131, or lisar@superiorcolorado.gov.

The Town of Superior has engaged MIG/Winston Associates (MIG) of Boulder, Colorado as a consultant to create and maintain a virtual 3D model of the town. The model is to be used to facilitate conceptual understanding and visualization of proposed development within the context of the Superior Town Center and surrounding area by the Board of Trustees and the public during development review and approval.

MIG has designed custom software for real-time simulation that allows users to move freely through the extensive model and view proposed development from any angle. Additionally, it includes tools to help verify accuracy and prove the validity of the model should it be questioned as well as determine the proposed development's visual impacts (including view planes) and measure compliance with regulations. The Virtual Model was created using LiDAR data obtained from DRCOG, the Town's GIS data, and aerial photography from the DRAPP program.

The Virtual Review Process will be used for development approval in the Superior Town Center. The applicant has the option to prepare a virtual model, with specific requirements, of the proposed building(s), or retain MIG, through the Town, to perform the work. Once MIG has inserted the proposed building(s) into the model, it will be shown in context with the surrounding buildings at public presentations. Trustees, staff, and the public will be able to look at it from various vantage points, drive-by at specific speeds, fly-around, etc.



This Virtual Review Process is intended to be a win-win for both the Town and developer. While this additional step is required, it may be equal to or less expensive than developing a separate physical or 3D model. This process will be utilized in upcoming Final Development Plan reviews this coming Spring and Summer 2014. Over time, the model will build out as the Superior Town Center builds out, to accurately reflect grading, views, structures and landscaping amenities. For questions on the Virtual Model or the process, please contact Lisa Ritchie with the Town of Superior at 303-499-3675 or lisar@superiorcolorado.gov.

GeCo in the Rockies

Are you looking to showcase your great work, a cool new process, tool, or application?

GeCo in the Rockies can help!

GeCo in the Rockies, a collaborative conference between GIS in the Rockies and GeCo West will be held **September 22-26, 2014**, in beautiful Grand Junction, Colorado. GeCo in the Rockies will be the premier geospatial technology and information event of 2014. You have an opportunity to be a part of this event. Join us as a presenter!

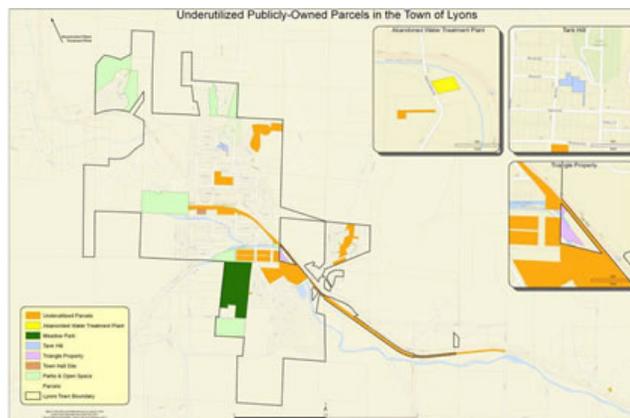


You are invited to share your professional geospatial knowledge, experience, and accomplishments at a technical session or with a poster display. Abstracts are being accepted now. Details can be found at <http://www.gecointherockies.org/abstractsubmission>. **The abstract deadline is May 2.**

The GeCo in the Rockies Planning Committee looks forward to seeing you in Grand Junction!

Resilient Colorado and Technical Assistance for the City of Lyons Flood Recovery

Resilient Colorado and Technical Assistance for the Town of Lyons Flood Recovery is an initiative of the University of Colorado Denver College of Architecture and Planning to assist Colorado communities recovering from the September 2013 floods. The initiative connects faculty and staff experience, student passion, and communities to facilitate recovery and contribute to a more resilient Colorado.



The departments of [Planning and Design](#), and [Geography and Environmental Sciences](#) at University of Colorado Denver (UCD) have begun work with the Town of Lyons to provide technical assistance during its flood recovery planning process. Over the past 12 weeks, the Town of Lyons has been conducting weekly meetings with recovery working groups. At the end of this process, the town will have a recovery action plan, and UCD will have contributed maps and analysis for

the planning process, with a polished 30-40 page planning document expected by May. Engagement will continue in the summer with a field studio on housing development in Lyons, and [Resilient Colorado](#) will be a multi-year engagement with Lyons.

Several instructors in both the Planning and Design, and Geography & Environmental Sciences departments agreed to help provide assistance when possible, including the production of the draft recovery plan, data, and GIS-driven maps. The objective is to provide students with the opportunity to work with a real-world client on a current relevant project, while simultaneously providing the Town of Lyons with professional and technical resources not normally accessible.

Data sources for this collaboration are being provided by Digital Globe, FEMA, DOLA, Boulder County, DRCOG, RTD, and USDA, among others. Digital Globe, in particular, generously provided a package of high-resolution panchromatic and multispectral satellite imagery covering the recovery area for before, during, and after the flood for our analyses.

In addition, students and faculty have participated in [volunteer](#) recovery efforts in the Town of Lyons, working alongside residents and meeting with the Town Administrator for a tour of the town and discussion of the challenges the recovery process in Lyons faces over the next few years.

DRAPP 2014 Update

Article provided by Ashley Summers, GIS Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org



Today marks the end of the spring flight window! Kucera International, Inc. successfully completed flights in Denver Metro, the eastern plains, and Weld County. The interim data is currently being reviewed and delivered to our data acceptance testing (DAT) and web map service (WMS) vendor, IntraSearch. Partners are expected to receive WMS access to the interim imagery in May.

The last deadline for participation is fast approaching. If you are interested in being a DRAPP 2014 partner but have not yet received a quote or submitted all your paperwork, contact the Project Manager Ashley Summers ASAP!

Save the Date! The next DRAPP meeting will occur on **April 24th at 10 a.m.** at DRCOG. For more information, contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

Bike to Work Day

Article provided by Christine Connally, GIS Analyst, DRCOG and Catherine Sanders, Regional TDM Program Sales Specialist, DRCOG. Christine can be reached at 303-480-6717 or cconnally@drcog.org. Catherine can be reached at 303-480-6757 or csanders@drcog.org.

[Bike to Work Day](#) is held each year in Colorado on the fourth Wednesday in June: this year's event is **June 25**. Bike to Work Day is an extraordinary community event because of the 150+ stations throughout the region, which serve free food and beverage to cyclists on Bike to Work Day. [Bike to Work Day stations](#) are

organized by volunteers - companies, non-profits, and partnerships. DRCOG's Way to Go program, which organizes Bike to Work Day, is always looking for new stations, especially in under-served areas. If you would be interested in organizing a breakfast station or afternoon water aid station, please visit <http://waytogo.org/biketowork> for more information, or contact btwd@drcog.org.



The latest Census American Community Survey data

Article provided by Josh Pendleton, GIS Specialist, DRCOG. Josh can be reached at 303-480-6784 or jpendleton@drcog.org

The latest Census American Community Survey data has been released recently, and DRCOG has added selected tables to our Regional Data Catalog. Listed below are the tables available in .csv format, at the Block Group, Place, and Tract levels.

2012 ACS 5 Year Survey - Block Group Level Data, Colorado

Assorted ACS Data from tables at the Census Block Group Level

B01001 - SEX BY AGE

B01003 - TOTAL POPULATION

B11005 - HOUSEHOLDS BY PRESENCE OF PEOPLE UNDER 18 YEARS BY HOUSEHOLD TYPE

B11016 - HOUSEHOLD TYPE BY HOUSEHOLD SIZE

B19101 - FAMILY INCOME IN THE PAST 12 MONTHS (IN 2010 INFLATION-ADJUSTED DOLLARS)

B25001 - HOUSING UNITS

B25003 - TENURE

B25024 - UNITS IN STRUCTURE

Download - <http://gis.drcog.org/datacatalog/node/305>

2012 ACS 5 Year Survey - Place Level Data, Colorado

Assorted ACS Data from tables at the Census Designated Place Level

B08013 - AGGREGATE TRAVEL TIME TO WORK (IN MINUTES) OF WORKERS BY SEX

B08101 - MEANS OF TRANSPORTATION TO WORK BY AGE

Download - <http://gis.drcog.org/datacatalog/node/304>

2012 ACS 5 Year Survey - Tract Level Data, Colorado (Table 1)

Assorted ACS Data from tables at the Census Tract Level - Table 1

B08013 - AGGREGATE TRAVEL TIME TO WORK (IN MINUTES) OF WORKERS BY SEX

B08101 - MEANS OF TRANSPORTATION TO WORK BY AGE

B08201 - HOUSEHOLD SIZE BY VEHICLES AVAILABLE

B08202 - HOUSEHOLD SIZE BY NUMBER OF WORKERS IN HOUSEHOLD

B17001 - POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE

B19080 - HOUSEHOLD INCOME QUINTILE UPPER LIMITS

B19081 - MEAN HOUSEHOLD INCOME OF QUINTILES

B19082 - SHARES OF AGGREGATE HOUSEHOLD INCOME BY QUINTILE

B19101 - FAMILY INCOME IN THE PAST 12 MONTHS (IN 2010 INFLATION-ADJUSTED DOLLARS)

Download - <http://gis.drcog.org/datacatalog/node/306>

2012 ACS 5 Year Survey - Tract Level Data, Colorado (Table 2)

Assorted ACS Data from tables at the Census Tract Level- Table 2
B04001 - FIRST ANCESTRY REPORTED
B07001 - GEOGRAPHICAL MOBILITY IN THE PAST YEAR BY AGE FOR CURRENT
RESIDENCE IN THE UNITED STATES
Download - <http://gis.drcog.org/datacatalog/node/307>

2012 ACS 5 Year Survey Metadata

A description of each census ACS table included in the above 4 tables, and each column within those census acs tables. For example, column B01001_1 in one of the above 4 tables is Table B01001, Line 1, in the metadata; and so on.
Download - <http://gis.drcog.org/datacatalog/node/303>

With each of these tables, the GEOID10 field is the linkable geographic unique id that links to the GEOID10 field in the Census 2010 Tract, Block Group, and Designated Place geographic datasets already available in the Regional Data Catalog.

Tracts (Census 2010) - Download -

<http://gis.drcog.org/datacatalog/content/tracts-census-2010>

Block Groups (Census 2010) - Download -

<http://gis.drcog.org/datacatalog/content/block-groups-census-2010>

Census Designated Places (Census 2010) - Download -

<http://gis.drcog.org/datacatalog/content/census-designated-places-census-2010>

Articles of Interest

[Data Sharing Leads to Powerful Tools for Fighting Fire](#)

[Latest GAO Report: GIS](#)

Meetings

Upcoming DRAPP meeting - 4/24

Upcoming DRDC meeting - 6/26

Contact Us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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January 15, 2014

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

DRAPP 2014 update



The 2014 Denver Regional Aerial Photography Project (DRAPP) is officially underway! In early November, a group of partners interviewed and selected [Kucera International, Inc.](#) and [IntraSearch/MapMart](#) as the 2014 DRAPP vendors to recommend for DRCOG Board approval. This is the same vendor team as in 2012. The vendors were officially approved Nov. 20 and a kickoff meeting was held at DRCOG Dec. 9. Contracts are being drafted currently and we expect them to be fully executed by Feb. 1.

DRCOG will be contacting potential partners through the end of January to provide quotes and gauge interest in project participation. If interested, the partner will receive a Letter of Intent (LOI), which is the method of solidifying the contract between DRCOG and partners and clarifies the amount due. If you are not

contacted by DRCOG and wish to participate in DRAPP 2014, please contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

LOIs are due to DRCOG by Feb. 1, 2014.

DRCOG Partners with FEMA and USGS for LiDAR

Article provided by Ashley Summers, GIS Manager, DRCOG. Ashley can be reached at 303-480-6746 or asummers@drcog.org

In October 2013, FEMA/USGS initiated a project to collect LiDAR in response to the Colorado flood disaster. Their project extent overlapped in part with the DRCOG region. Since DRAPP members had previously expressed interest in LiDAR data, DRCOG pursued partnership on this federal project and was able to pass on significant cost savings to its partners.

DRCOG and its partners are scheduled to receive deliverables covering 3,600 square miles. Those deliverables include a classified point cloud, a hydro-flattened digital elevation model (2.5' pixel), and 1ft. contours.

All the data in the DRCOG region was collected before the snowstorm hit in early December. A couple of re-flights may need to occur in a small section of the mountainous terrain once conditions improve.

The data will be finalized and in the public domain by late spring 2014. This delivery is well aligned with the DRAPP schedule and will enable this data to inform a more accurate imagery product

The Location of Disaster

Article provided by Victoria Smith-Campbell, GIS Specialist. Victoria can be reached at 720-515-6277 or victoria@enthusd.com

There have been numerous stories on the 2013 Colorado Floods. Press releases have summarized the amazing numbers. Reporters have documented the heartbreaking stories of fatalities and people losing their worldly possessions. Our state has risen to the challenge and is recovering from this horrific disaster.

During a disaster, there are at least three separate areas to consider:

- Crisis Communications- external to organization
- Planning and Operations- internal to organization
- Interagency Coordination- typically internal to government and partners

Crisis Communications is a different type of map making. The goal is to quickly communicate only the essential information. Typically this information includes: evacuation areas, human and animal shelter locations, information centers, and the affected area (fire perimeter, flood extent, rockfall, etc.). Focus on areas you want people to receive services at or stay away from. Generally, this will be a subset of the operational data with friendlier icons in an interactive format. As a member of the Jefferson County Incident Management Team (IMT) we used Google Maps to deliver simple interactive maps during the 2013 Flood. The JeffCo IMT map received over 1.8 million direct hits and positive feedback. Google.org aggregated multiple-county information into a single map including Boulder, Jefferson, Larimer, Weld, and Adams County data. The Google.org crisis map also integrated incident information with Civil Air Patrol photos and national data with Red Cross shelters, National Oceanic and Atmospheric Administration (NOAA) US Significant River Flood Outlook, and Weather.gov Watches, Warnings and Advisories.
Goal- Provide for safety through information.

Planning and Operations for Incident Management Teams (IMT) or Emergency

Operations Centers (EOC) at the local or state level is a much more formal process with a regimented set of products and timelines. At the IMT level there are standardized symbols, directory structures, naming conventions, and transition guidelines. In the EOCs dozens of GIS staff across the state conducted queries on enterprise parcel databases, analyzed road networks for detours, and consolidated damage assessment information to support the disaster declaration process (bits and bytes = additional support).

Goal- Provide information informing decision-making and operations in order to provide resources to the affected communities.

Interagency Coordination enables everyone to understand what resources are available, ensure the tasking of resources includes all needs, and data gathering efforts are not duplicated. Thousands of staff gather information and data that is combined and sorted into a systematic picture. Twitter was an essential form of communicating between agencies both to amplify messages and to communicate privately through direct messages. During the floods, the State of Colorado created a Google Group just for GIS communication. This allowed government and partner organizations to share information, ask questions, and answers were found.

Goal- Create data once for many uses. Everyone has access to relevant resources

During the Colorado floods, numerous tools and platforms were used to communicate location both internally and externally. There were many successes and challenges that continue to help us develop as a community.

Questions for reflection:

- What is your strategy to get geospatial information out to the public? If you post PDFs will you also share the data?
- Do you know how the data you are collecting is being used up the chain for situational awareness or the disaster declaration process?
- If a disaster happened in your jurisdiction, how would you reach your GIS neighbors? How will they reach you? Do they know who to call? Are you at a different phone number? On Twitter?

For information during emergencies you can find information at: www.coemergency.com or on Twitter @coemergency

Locate information on your local emergency management office: <http://www.coemergency.com/p/local-info-sources.html>

Not Just Civic Idealism: The Dollars and Cents of Open Data

Article provided by Brian Timoney, Principal, The Timoney Group. Brian can be reached at 303-929-3722 or brian@thetimoneygroup.com.

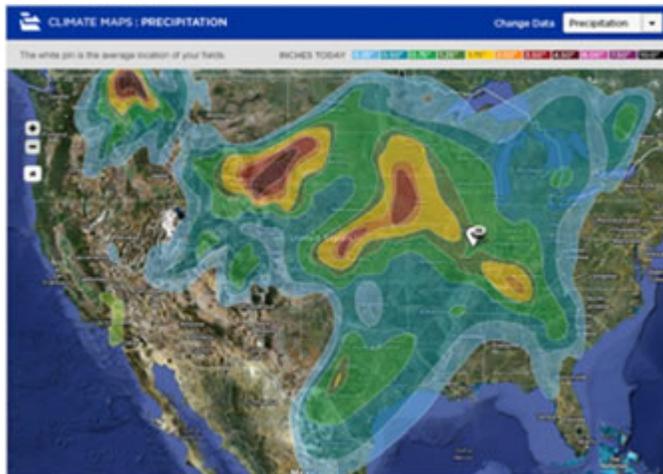
It's an accomplishment of sorts that the open data movement has been around long enough to acquire its own outdated stereotype of being strictly the domain of youthful idealism among tech-savvy hacker types. And like many stereotypes, there's a grain of truth in it: yes, we still have hackathons and references are made to a new type of "digital government"--more responsive, more transparent, etc. But to a long-time observer, what's most interesting is the argument for the economic benefits of open data are fast becoming conventional wisdom.

The management consultancy McKinsey recently released a [study](#) estimating a potential \$3-5 trillion (yes, that's a "t") global economic impact among seven economic sectors. The case of Climate Corporation is instructive: combining decades of U.S. weather, soil, and crop yield information freely available from the government, it was able to craft a new type of crop insurance product for farmers. Monsanto recently purchased the company for \$930M.

So what's changed? Obviously the rise of cloud-based server and database infrastructure has driven the cost of storing and publishing data down to pennies

per gigabyte. But equally important has been the growing adoption of analytics or "data science" to uncover more sophisticated insights than what's traditionally been revealed by standard statistics. The haystacks of data are only getting larger; and tools such as R and Hadoop are being deployed to help find the valuable needles.

But this strikes most of you as very big picture. So let's talk about financial benefits of open data your organization may not have considered. In transitioning from a data sales model to an open data model, the City of Denver saw a 75 percent reduction in phone calls seeking data acquisition. Less quantifiable but very real were the efficiency gains in interdepartmental data flows as communication friction is removed when information requests can be fulfilled immediately with a simple URL link.



The barriers to opening your data continue to get lower. CKAN, the platform that powers Data.gov, Data.gov.uk, and our homegrown OpenColorado.org is free, open source software. Even easier for getting started is using Github as your publishing platform as the city of Chicago has done with some of its most popular datasets (<https://github.com/Chicago>).

In the current environment of frozen budgets and stretched resources, it's becoming clear that stewards of government information can no longer afford not to enjoy the variety of economic benefits created by open data.

DRCOG Models for Scenario Planning

Article provided by Gabrielle Voeller, Planner, DRCOG. Gabrielle can be reached at 303-480-6765 or gvoeller@drcog.org.

DRCOG staff is working hard on Metro Vision 2040, the next iteration of the regional long-range plan. As part of this process, the planning team is engaged in scenario planning to test different future outcomes that will inform the plan's goals and policies. Scenario planning is complex, but it basically goes like this: "If we did X starting now, what would our region's land use and transportation patterns look like in 2040?"

In the near future at DRCOG, a cutting-edge new land use model (UrbanSim) and sophisticated transportation model (FOCUS) will work together to make detailed predictions for each scenario. Because UrbanSim is in the final stages of calibration, DRCOG's modelers have created an interim tool called PointSim to begin the scenario planning process.

PointSim takes the zone-level quantities of households and jobs (specified by the land use model) and intelligently places them at specific points inside each zone. Many of the built environment datasets created for UrbanSim were use to this point-level placement, such as parcels, buildings, and establishment locations.

Using PostGIS tools, staff created a script that ranks each parcel in a zone by how attractive it is for development based on factors such as distance to transit, highways, schools, parks, retail, and civic institutions. Each parcel also was given a capacity for households and jobs, depending on its land use. For example, a parcel with an apartment building would have a larger capacity for households than a

parcel containing a single-family home; a school parcel would have a larger capacity for education jobs than entertainment jobs. Taking both the parcel ranking and its capacity into consideration, PointSim creates a certain number of points in each parcel within the zone, up to the total number of points specified by the land use model.



Some scenarios require different numbers of households and jobs in each zone (e.g. changes to the zone-level totals), while other scenarios require changing how the points are allocated within the zone (e.g. changing the parcel capacities and parcel-ranking algorithm). This tool has helped bridge the divide between old and new models, and provided point-level detail to use in the regional planning process.

This picture of Sloan's Lake shows household points in blue, education jobs in red, service jobs in yellow, and retail jobs in green. PointSim was designed to exclude the lake and park, ensuring no future development was allowed in these types of areas.

PointSim has served as a critical stopgap tool to forecast population and employment at a parcel level for the Denver region's travel model. DRCOG is excited to announce the UrbanSim rollout this spring.

The new land use model will be used for future land use runs, providing for more realistic socioeconomic results in locational patterns and related traffic impacts. DRCOG will be holding meetings in early spring 2014 with its member governments to share information and data from UrbanSim.

For more information, please contact Gabrielle Voeller at gvoeller@drcog.org or 303-480-6765.

Community Profiles

Article provided by Robin Reilley, Planner, DRCOG. Robin can be reached at 303-480-6739 or rreilley@drcog.org

Community Profiles are a popular product that DRCOG provides for member governments and the public at large. The Profiles represent a statistical snapshot of Census, in this case the 2010 Census, American Community Survey (ACS), and DRCOG data sets representing demographic, travel, planning and transportation information.

With 56 member governments there is a great deal of data to distill. Each document possesses 5 graphs, 4 tables and one map. The new Community Profiles are available in the Regional Data Catalog here:

<http://gis.drcog.org/datacatalog/subjects/community-profiles>

For more information on the Community Profiles, contact Dan Jerrett, DRCOG

Regional Economist, at djerrett@drcog.org or 303-480-5644.

Articles of Interest

MetroGIS recommends 7 counties make geospatial data free and open:
<http://www.minnpost.com/politics-policy/2013/12/metrogis-recommends-7-counties-make-geospatial-data-free-and-open>

Public Records Request Denied?
<http://www.gisn8.com/2013/03/public-records-request-denied.html>

Public Issue Participation Can Prevail
<http://www.sensorsandsystems.com/article/columns/32300-public-issue-participation-can-prevail.html>

Open data: Unlocking innovation and performance with liquid information
http://www.mckinsey.com/insights/business_technology/open_data_unlocking_innovation_and_performance_with_liquid_information

Meetings

- a. [Materials from the 8/29 DRDC meeting](#)
- b. Next DRDC meeting is 2/27/14

Contact us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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October, 2013

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter is published quarterly.

Some links in this newsletter go to sites maintained by the federal government. These sites are not being maintained during the shutdown; the links should function correctly again once the situation in Washington changes. We apologize for the inconvenience.

Nederland uses LiDAR Data for decision-making

Article provided by Lex Ivey, TerraCognito GIS Services Principal. Lex can be reached at 303-258-3515 or lexivey@terracog.com.

In the mountains of Boulder County, the Town of Nederland has begun using Colorado Water Conservation Board (CWCB) LiDAR for planning and design decision making. TerraCognito GIS Services has been retained by the town to process the raw LiDAR point data into usable contours and raster surfaces. The refined datasets will initially be used in mapping and modeling efforts related to the town's infrastructure master plan, but that's just the beginning. The town hopes to fully leverage this rich dataset in fire protection planning, storm water management, economic impact studies, solar radiation potential, and other projects requiring highly accurate mapping and visualization.

While LiDAR data is expensive and not normally available to small towns like Nederland, Mayor Joe Gierlach immediately saw the benefit of using the data resource. Having this highly accurate elevation information is crucial for land-use planning as well as conservation efforts, especially in mountainous areas. Mayor Gierlach and Lex Ivey are optimistic that making use of the CWCB LiDAR data will

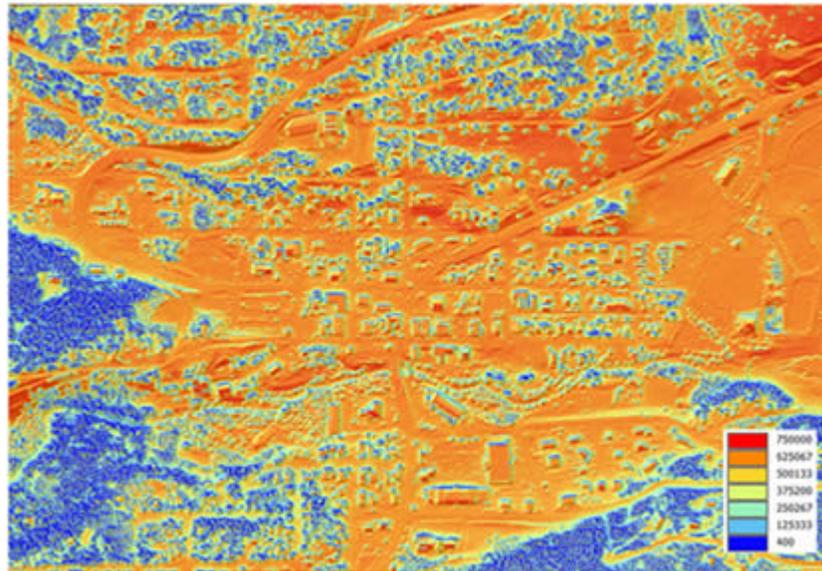
help streamline public works-related operations of the town, help its Downtown Development Authority with a commercial floor space inventory, and help communicate information to residents when making decisions for the present and the future of Nederland.



Hillshade of Digital Surface Model (DSM) of downtown Nederland--First Returns



2-ft Contours of downtown Nederland



Solar Radiation Map (WH/m²)--downtown Nederland

DRAPP 2014 update



The 2014 Denver Regional Aerial Photography Project (DRAPP) is picking up steam. RFPs were released in late August. We received a total of 16 bids: six for imagery, four for DAT, four for LiDAR and two for WMS.

During the first week of October, DRCOG distributed the bids to evaluation teams made up of potential DRAPP 2014 partners. This process of having our partners evaluate, score, and interview our potential vendors is essential to the success of DRAPP because it helps ensure the chosen vendor is acceptable to our varied partner group.

Scoresheets are due back to the DRCOG Project Manager Oct. 24. That means there is still time to participate in the evaluation process! Please get in touch ASAP if you would like to review bids from any of the categories (Imagery, LiDAR, Quality Control, WMS/Resale).

Based on the closeness of the scores, DRCOG will determine how many of the candidates to interview. We usually bring in the top two from each category. Interviews will be held sometime between Oct. 28 and Nov. 4. Approval of the vendors by the DRCOG Board will be sought Nov. 20.

Our next meeting will be held the morning of Nov. 21. All potential partners should attend. At that point, we will have chosen a vendor, and project costs will be known. This meeting will be the primary time for you to represent your organization's needs on a few remaining specifications before the final contracts are written with the vendor in January 2014.

Also, please be alerted that Letters of Intent (LOIs) will be going out earlier than normal for this project. The Letter of Intent (LOI) process is the means by which DRCOG solidifies the contract with partners and clarifies the amount due. These will be sent to potential partners in late November/early December and need to be signed and returned as soon as possible.

If you have questions or concerns, please contact Ashley Summers at asummers@drcog.org or 303-480-6746.

Colorado Data Summit brings data community together

Article provided by Brian Gryth with the Colorado Secretary of State's office. Brian can be reached at 303-894-2200, ext.6213 or Brian.Gryth@SOS.STATE.CO.US.

The Colorado Secretary of State's Office recently created a Business Intelligence Center (BIC) to "aggregate public data and make it available to the widest audience in the most useful format." To this end, the BIC hosted a Colorado Data Summit in late August to encourage a more cohesive open data community, identify issues and opportunities, and determine next steps for this statewide initiative. Attendance included representatives from cities, counties, regional and state government, non-profits, universities, the health care industry and private technology firms.

For those of us in the GIS community, the issues surrounding inaccessible data are well known. Silo-ed or restricted data leads to duplication of effort, as each organization has to mine, "clean," and interpret similar datasets, instead of sharing one amongst themselves. Due to current data restrictions, each organization in the state that needs this information must request it, pay for it, and prepare it for analysis. This process not only wastes time and money, but creates inconsistencies between datasets and results that are supposed to be comparable.

Another identified barrier is lack of a governance structure for open data to guide standardization of data models and associated data products (e.g. metadata). A governance structure could also create a policy framework for data publishing that honors ownership and maintains data integrity.

The group went on to discuss the need for a central repository for data that could serve as a "one-stop-shop" for the State of Colorado. Currently, there are many data portals working toward this goal. The [Colorado Information Marketplace](#), [OpenColorado](#), and the Piton Foundation's [Colorado Data Engine](#) all serve out statewide data. DRCOG serves regional-level data through the Regional Data Catalog, and many local governments are beginning to put data on their own websites.

While there were many issues and barriers to be discussed, there are equally as many opportunities for success. For example, better illustrating the benefits of open data versus the perceived risks could help build momentum for change. Celebrating the organizations already ushering in change by sharing their own data, and engaging the data user community to provide organizations with feedback on data usefulness are other strategies that were discussed.

Next steps for this group include meeting again in a few months to continue this discussion and to make an action plan.

What is a datum realization and why should we care?

Article written by Ashley Summers, DRCOG GIS Manager, inspired by Pam Fromhertz, NOAA NGS Colorado Geodetic Advisor. Ashley can be reached at 303-480-6746 or asummers@drcog.org; Pam can be reached at 303-202-4580 or pamela.fromhertz@noaa.gov.

In the world of GIS, we understand the importance of specifying the correct projection and datum of our data. To neglect this could cause misalignments or distortions that lead to error in our analyses. Even though we know this in theory, how many of us dig deeper into the accuracy issue and ensure that we are specifying the correct Datum Realization, Epoch and Geoid for all our datasets and capturing that in the metadata? Probably not many. That may need to change in the near future because with increasing capabilities of our data collection technologies (e.g. LiDAR) and more demanding project requirements (e.g. to support survey-level work), failing to understand and address these components could lead us down a rabbit hole of errors.

For those of us who haven't been in school for while or those who picked up GIS on the job, here's a little refresher on terms.

An Ellipsoid is a mathematical surface. Its dimensions are determined as a best fit to the world's geoid model and allows for easier calculation of positions.

The Origin in the past (e.g. for NAD27) was a point at Meades Ranch, KS based on the Clarke ellipsoid of 1866. The origin for more recent datums (e.g. NAD83 and WGS84) is the center of the earth's mass based on the Geodetic Reference System of 1980 (GRS 80).

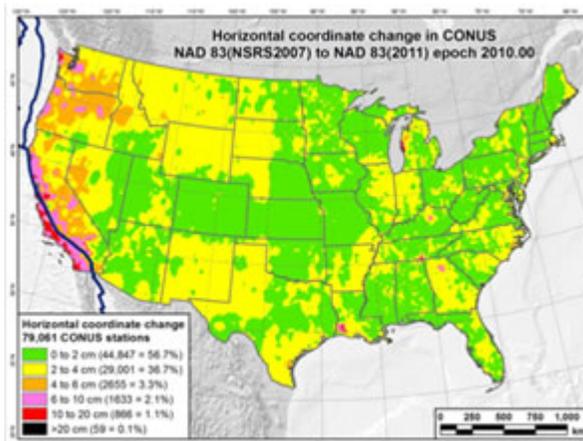


Image from <http://www.spatial-ed.com>

A Horizontal Datum refers to the reference specifications of a system of coordinates. The datum will specify the ellipsoid and the origin.

Datum Realization (also referred to as a Datum Adjustment) occurs when the [National Geodetic Survey](#) (NGS) re-computes the positions of known points (i.e. survey marks) based on new data observations to account for technological improvements and movements across the earth's surface.

An Epoch is the date that the coordinates were held in the realization. An epoch is simply an extra level of granularity used to provide a time stamp of the positional information. This has become more critical in places that are very tectonically active (Note that Colorado is fairly tectonically stable, so we don't have to worry much about epochs).

A Geoid represents the gravity potential that approximates mean sea level.

To summarize those terms, let's dissect this coordinate system description:

NAD 83(2011) epoch 2010.00.

- NAD83 - North American Datum of 1983. This is the geodetic datum. It references the GRS80 ellipsoid.
- (2011) - The year of the latest NGS datum realization.
- epoch 2010.00 - The time stamp of when the observational data computations were held.

Now the big question: Why do we care about these things?

Answer: Because it can affect the accuracy of our work.
NGS has made four realizations to NAD83.

1. The **first realization** was released in 1986 before GPS (so it was 2-dimensional). The relative national network accuracy was at the 1m level.
2. The **second realization** was done on a state-by-state basis due to the advent of GPS, and exceeded the accuracies published in the 1986 realization. This realization occurred in Colorado in 1992. It is referred to as the High Accuracy Reference Network (HARN) realization and it increased accuracy nationally tenfold; to the 10cm level. Relative accuracy was actually at the 2 cm level here in CO from the HARN.
3. The **third realization** was released in 2007 - called NAD83 (NSRS2007) - and was based on approximately 70,000 monuments. The data from GPS observations on the monuments were tied to 700 stations in the Continuously Operating Reference Stations (CORS) network - called NAD83(CORS96). Due to the continuous GPS data collected by CORS, the nationwide accuracy level increased to 1cm, and again, Colorado remained at a relative accuracy at the 2 cm level. (Keep in mind that this realization, as well as the first two, has been officially superseded).
4. The **fourth realization** was released in 2011 - called NAD83(2011) epoch 2010.00. Observed data at approximately 80,000 NGS monuments were tied to 1195 CORS (IGS08) epoch 2005.00 and produced better absolute accuracy, both horizontally and vertically. If you use any of the NGS products or tools (e.g. [Opus](#), NGS CORS data) it is best to use this realization to ensure consistency.

For much of the analyses that we do in government GIS, we are looking at data trends at a less-detailed level. Plotting incidents of crime, estimating canopy cover in urban landscapes, and determining a watershed to a train station don't rely on sub-centimeter accuracy.

However, when you are building bridges, putting in water lines, or working with planimetric data (e.g. Edge of Payment or Building Outlines) the difference between 1cm, 10cm, and 1m could be substantial. It all comes down to what you are trying to do with your GIS data.

The most important concepts to take away from this article are:

1. **Consider updating your datasets to the most recent datum realization to stay in sync with NGS. If you can't do that, then...**
2. **Document, document, document the full projection and datum for all your datasets and data sources so that you and all users of your data know the level of error when the data is applied.**

How to apply this knowledge in ArcMap:

Most of us use a State Plane projection in US Feet - either North or Central, so that leaves us with the following eight options when mapping our data. Here's how we think they correspond to the realizations listed above.*

Realization 1	NAD 1983 StatePlane Colorado North 0501 (US Feet) - WKID 2231 NAD 1983 StatePlane Colorado Central 0502 (US Feet) - WKID 2232
Realization 2	NAD 1983 HARN StatePlane Colorado North 0501 (US Feet)- WKID 2876 NAD 1983 HARN StatePlane Colorado Central 0502 (US Feet)- WKID 2877
Realization 3	NAD 1983 NSRS2007 StatePlane Colorado North 0501 (US Feet)- WKID 3504 NAD 1983 NSRS2007 StatePlane Colorado Central 0502 (US Feet) - WKID 3502 NAD 1983 (CORS96) StatePlane Colorado North 0501 (US Feet)- WKID 103247 NAD 1983 (CORS96) StatePlane Colorado Central 0502 (US Feet) - WKID 103248
Realization 4	The projection files for NAD 1983 NRS2011 will not be available in ArcMap until the 10.2 release. If you need them now, download here .

Read about the differences between CORS96 and NSRS2007 [here](#).
Download NAD 1983 NRS2011 projection files [here](#).

**Pam, Ashley, and ESRI Technical Support collaborated on crosswalking these projections to their corresponding realizations. With that said, the authors have not yet found official documentation that confirms these assertions.*

Next Steps

We will be featuring more articles and presentations on this topic through the Data Consortium over the next several months. In the interim, if you have specific questions or want more information on this complex topic, please contact Pam Fromhertz at NOAA.

City and County of Denver maps walksheds around transit stations

Article provided by Andrea Santoro with the City and County of Denver. Andrea can be reached at 720-865-2946 or andrea.santoro@denvergov.org.

As the population of the Denver metro area continues to grow, improving mobility and transportation infrastructure is key to our region's success. We have seen the commitment to an expanded rail transit system with the Regional Transportation District's FasTracks program and the recent opening of the West Rail Line, connecting downtown Denver to Golden. As this system is being constructed and stations are established, transit area planning and Transit-oriented Development (TOD) have become a high priority for the City and County of Denver. Denver's Community Planning and Development Department (CPD) has taken the lead on this by maintaining a TOD Strategic Plan and adopting numerous station area plans specific to individual stations.

TOD is defined as the development surrounding a transit station, where the station is a key feature. TOD areas ideally contain high-density and a mix of land uses, where people can live and work and move around without dependency on an automobile. They are generally identified by their walkshed, which covers the distance it is assumed that people will walk to get to a transit station. For light rail and commuter rail, it is estimated that people are willing to walk approximately half a mile. In the past, CPD has mapped TOD walksheds "as the crow flies," which does not necessarily represent the area where people are physically able to walk. To produce more accurate representations of the transit station walksheds, CPD's GIS staff utilized Esri's Network Analyst to map a half-mile distance against a walk network, incorporating off-street trails, and taking into account barriers such as interstates, rivers, and railroads.

The process of mapping the walksheds began with preparing the base data, or the walk network, against which the analysis would be run. The street network was modified to exclude streets where people do not walk, such as highways and highway ramps. Pedestrian bridges and off-street trails were added in, as well as future connections and network intersections. The dataset is populated with key attributes for distance, walk speeds, and time traveled, which allow the software to map all possible half-mile routes traveling away from each station. An area is generated by connecting the half mile routes, creating the walkshed polygon. This map of Perry Station shows the traditional half-mile buffer as compared to the modified walkshed derived from the walk network. By mapping the actual half-mile walksheds, CPD is able to assess connectivity, identify barriers, and evaluate where potential infrastructure improvements would be most beneficial, and planners are able to more effectively plan for future development



What can a public entity charge for electronic data in Colorado?

Article provided by Dave Murray with the City of Westminster. Dave can be reached at 303-658-2140 or dmurray@CityofWestminster.us.

I posed this question to one of our staff attorneys a few months back. There was a landmark case out of California this year; *The Sierra Club vs. Orange County*, which required the county to produce the records requested not to exceed the cost of duplication. Cost recovery could not be applied by the county and especially not to the tune of \$475,000, which was the price of their landbase. While this case was out of California and not Colorado, legal rulings out of California can influence similar cases here.

So what does Colorado permit a public entity to charge under the Colorado Open Records Act (CORA) for electronic data?

1. Nominal research and retrieval fee for the information requested. A fee of \$15 to \$20 per hour has been upheld as a reasonable fee in *Black v. S.W. Water Conserv. Dist.*, 74 P.3d 462.
2. The actual cost of manipulating data in order to generate a record requested by a person. CRS 24-72-205 (3).
3. If the public record is a result of computer output other than word processing, the fee for a copy, printout, or photograph thereof may be based on recovery of the actual incremental costs of providing the electronic services and products together with a reasonable portion of the costs associated with building and maintaining the information system. **Such fee may be reduced or waived by the custodian if the electronic services and products are to be used for a public purpose, including public agency program support, nonprofit activities, journalism, and**

- academic research. Fee reductions and waivers shall be uniformly applied among persons who are similarly situated.** CRS 24-72-205 (4)
4. All costs associated with records transmission but no fee for sending digital records via email. HB 13-1041.

In the case of a public entity that is charging for electronic data, the options suggested by our staff attorneys are:

Option 1. Work with Data Consortium members to persuade the charging entity that the data is being used for a "public purpose" and request the fee be waived per CRS 24-72-205 (4).

Option 2. Inquire as to other entities receiving this information from the public entity at no charge and convince the entity that the Data Consortium members are "similarly situated" as describe in CRS 24-72-205 (4).

Option 3. Ask the public entity the basis for the fees they charge so we can determine if the fees are consistent with CORA.

Option 4. If legally defensible, challenge the fee schedule in court.

The Data Consortium's mission is to provide members with the most current authoritative information to serve our customers. When some jurisdictions do not participate, we all lose. We are left scrambling to come up with data to fulfill our roles. This is why the effort to acquire data for public purposes is so important. Moving forward, I suggest we consider Option 1 when faced with government entities that charge for their data. A collective effort at making a formal request to waive fees for those of us in the public sector could be an effective course of action. Hopefully these entities would come to realize the greater benefit of sharing data and amend their current policies.

Options 2 and 3 would be the next steps to help us understand the scope of how data is being sold and to whom. As the CORA states, a portion of the cost of creating the data can be recovered. Do charging entities have a review schedule for their fees like many private- sector companies? Also, what constitutes a case where data is freely given to government entities and is it consistent with CORA? While jurisdictions like Denver and Broomfield have given up charging for digital data, what revenue is being generated by those that do? These are just some of the questions that would help us make a better case for data sharing.

The last option is not viable at this time. Court proceedings are expensive and time-consuming. Still, if it comes to that, there must be enough participants willing to fund an effort to make the case worthwhile. If you think of all the time wasted in duplicate effort, the economics become more favorable.

This is an ongoing effort that will discussed and followed up on at future Data Consortium meetings. If you have any comments or would like to discuss this effort, please contact Dave Murray at 303-658-2140.

Additional reading:

[21st Century Sunshine: Modernizing CORA](#)

[What is a reasonable CORA fee?](#)

[Changing technology landscape requires changing open data policies](#)

What's the plan for the Regional Data Summit?

DRCOG hosted its largest Regional Data Summit to date last January. We had excellent attendee turnout, and a full day of thought-provoking presentations and discussions. Although DRCOG staff were pleased with the event, the post-event survey showed mixed results on how to move forward. The Regional Data Summit premiered in 2009 as a way to highlight the accomplishments of the Regional Data

Consortium - a group of GIS professionals in the region working "to support informed decision making in the Denver region by organizing, developing, maintaining, sharing, enhancing, and distributing regional data." As many of our regular Data Consortium meeting attendees know, this mission is challenging. Collaborating to create authoritative, regional data takes staff time, executive support, agreement on methodologies and schemas, and consensus on a data sharing policy. As the Data Consortium coordinator, I am happy to report that we are beginning to make progress on some of these components by encouraging a more open and collaborative Data Consortium meeting format and by issuing a quarterly newsletter that highlights our successes and challenges. With that said, there is a considerable amount of work to be done to get traction and until we make further progress, DRCOG is postponing the Regional Data Summit. When we meet again for this celebration, the role of the Data Consortium and the purpose of the Data Summit will be clearly defined and set up for success!

Meetings

- a. [Materials from the 8/29 DRDC meeting](#)
- b. Next DRAPP meeting is 11/21/13
- c. Next DRDC meeting is 2/27/14

Contact us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

Disclaimer: The information provided in this newsletter is compiled from multiple sources and is intended for informational purposes only. DRCOG assumes no responsibility or legal liability for the accuracy, completeness or usefulness of any information in this newsletter.





July 15, 2013

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The Data Consortium consists of DRCOG members and regional partners with an interest in geospatial data and collaboration. The Data Consortium Newsletter is designed to improve communication among local GIS professionals and features updates from all levels of government as they relate to data and geospatial initiatives in our region. This newsletter will be published quarterly.

Introducing DRCOG's cutting-edge land use model - UrbanSim

For the past few years, DRCOG has been hard at work developing a new land use model. Land use models start with information on the existing built environment, including current zoning rules, how land is being used, and what types of buildings, jobs and people exist where. Then, using data on development trends, population growth, and other socioeconomic factors, the model makes predictions about what our region could look like in the future. These predictions inform planning and policy and are an essential component of the Metro Vision process.

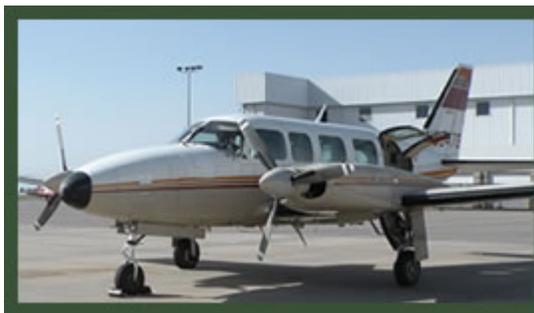
The new model, UrbanSim, is a cutting-edge tool with substantially more analysis capability than previous models. This increased capability comes from the detailed data that powers the model. DRCOG spent years compiling, cleaning, analyzing and standardizing local building, parcel, and job data to feed into UrbanSim, which will allow it to do analysis at the parcel level.

Currently, UrbanSim is being calibrated with a target date for completion in fall of 2013. Watch for more information about UrbanSim's launch in upcoming issues.

DRAPP 2014 planning is underway

Planning for the next Denver Regional Aerial Photography Project (DRAPP) has

already started. Previous partners had asked that additional deliverables, such as Light Detection and Ranging (LIDAR) and 3-inch resolution imagery, be considered as part of the 2014 project. To accommodate these potential additions, the planning process started in April 2013 with budget discussions. A LIDAR workgroup was also formed to provide guidance for this type of acquisition. RFPs are being drafted for imagery, data acceptance testing, web-mapping services, and a LIDAR acquisition. These documents are being reviewed by groups of volunteers made up of interested and knowledgeable partners.



The preliminary DRAPP 2014 Timeline is:

June 2013 - Provided RFPs to review workgroups

July 2013 - Finalize the RFPs

August 2013 - Release RFPs for bids

October 2013 - Vendor selection

November 2013 - Vendor approval by DRCOG Board

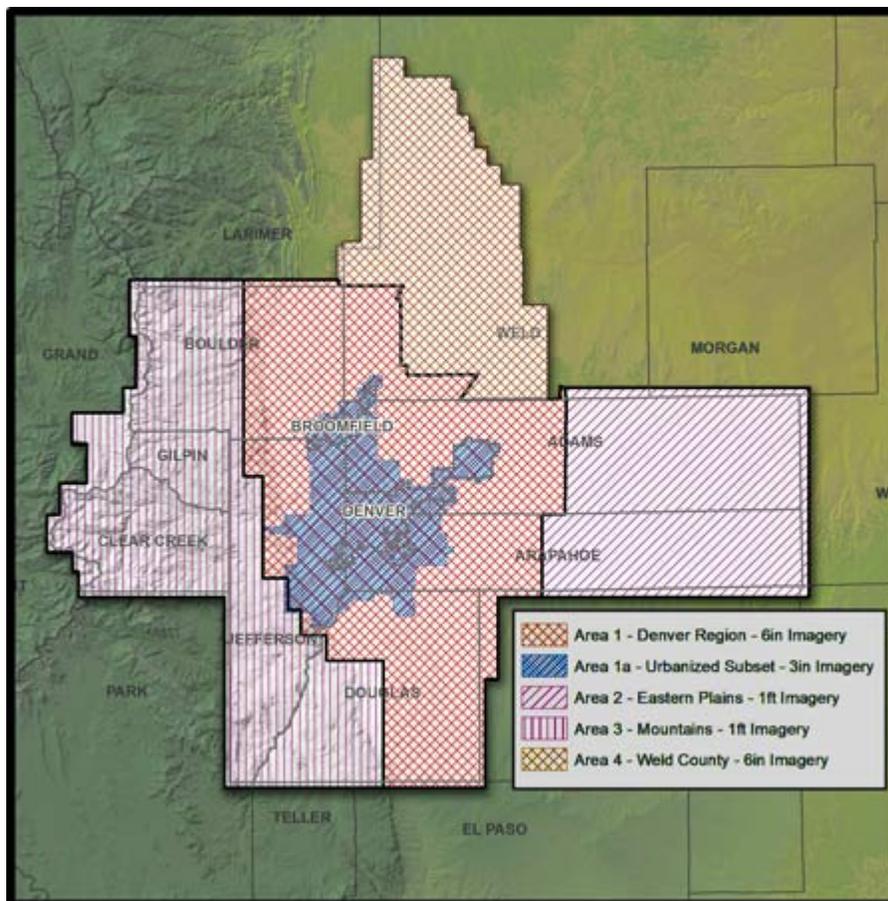
December 2013 - Preparation of Scopes of Work

March/April 2014 - Spring imagery flights (could also include LIDAR)

June 2014 - Summer imagery flights (could also include LIDAR)

Fall 2014 - Potential LIDAR flights (if they haven't occurred already)

If you are interested in volunteering throughout the RFP process, have any questions about DRAPP, or would like to join (new participants may join the 2014 project until early next year), please contact Ashley Summers at 303-480-6746 or asummers@drcog.org.



[Click here for larger view of map!](#)

U.S. Census launches Geographic Support System Initiative

Article provided by Jim Castagneri with the US Census Bureau in Denver. Jim can be reached at 720-962-3882 or james.d.castagneri@census.gov.

The Geographic Support System Initiative (GSS-I) is an integrated program of improved address coverage, continual spatial feature updates, and enhanced quality assessment and measurement.



The Census Bureau designed this voluntary program to make the 2020 Decennial Census more efficient by collecting address and map information from its partners throughout the decade. By working with partners at all levels of government, the Census Bureau intends to create an accurate and up-to-date address list for most jurisdictions without the need for conducting a full address canvassing operation just before the 2020 Census. This will save time and resources during census operations as well as improve data collection and quality for current surveys, including the American Community Survey.

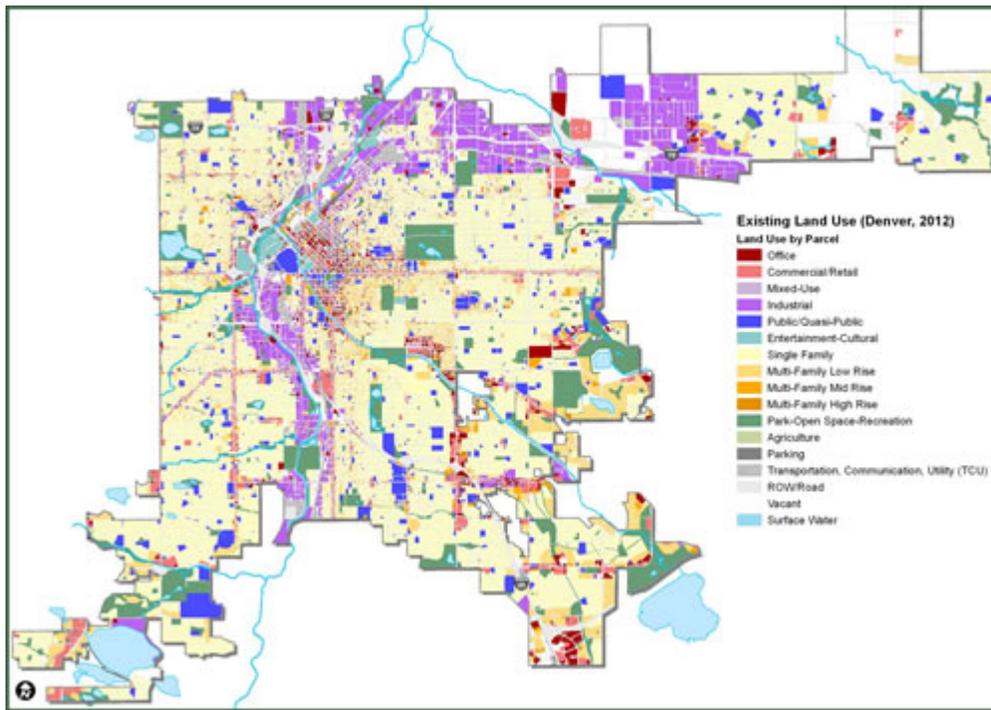
1. Address improvement: explore methodologies to achieve complete coverage and a current address list, concentrating on rural areas, Puerto Rico, and group quarters, and improving geocoding of all addresses to their location
2. Feature improvement: continual update of the street network and attributes to improve the matching of addresses to their correct geography
3. Quality improvement: broaden quality assessments and provide quantitative measures
4. Improved Partnerships: strengthen existing and develop new partnerships

Visit <http://www.census.gov/geo/www/gss/> to learn more.

DRCOG and the City and County of Denver collaborate to address local and regional planning needs

Article provided by Andrea Santoro with the City and County of Denver. Andrea can be reached at 720-865-2946 or andrea.santoro@denvergov.org.

Existing land use is a fundamental representation of the built environment in the field of urban and regional planning. Evaluating the current distribution of uses can tell a lot about the character of a landscape, while projecting future demand is critical to establishing a long-term, sustainable, land-use plan.



Several years ago, the City of Denver's Community Planning and Development Department (CPD) recognized that the Assessor's parcel data was not sufficient for analyzing existing land use consistently across the city. There are hundreds of tax classifications in the parcel layer, many of which do not represent true ground conditions. This drove CPD to derive its own more simplified and accurate land use layer. It was around this time that DRCOG was also developing a regional built environment layer for use in its predictive modeling software, driving another need for a generalized land use schema.

While the ultimate uses of these land use layers would vary between CPD and DRCOG, it seemed that creating a schema that could accommodate both needs and minimize redundant data processing would be the best approach. CPD and DRCOG drafted their initial land use classifications, and discussed those which overlapped or conflicted with each other. For example, DRCOG's multi-family classifications have a focus on ownership (apartment vs. condominium), while CPD's focuses on density (low-, mid-, or high-rise). To address this and other discrepancies, CPD incorporated two tiers of land use classes into their schema: Level I, which consists of 18 highly generalized classes, and Level II, which has a finer grained breakdown of uses. The Level II values translate directly to DRCOG's schema, while Level I accommodates the needs of CPD. Below is an example of how the schemas are related.

CPD Land Use Level II	CPD Land Use Level I	DRCOG Land Use
Apartment Condominium	Multi-Family Low Rise	Apartment Condominium
Apartment Condominium	Multi-Family Mid Rise	Apartment Condominium
Apartment Condominium	Multi-Family High Rise	Apartment Condominium
Factory Manufacturing	Industrial	Industrial Industrial
Library School	Public/Quasi-Public	Government School
Museum	Entertainment-Cultural	Government

As CPD and DRCOG continue to update their land use layers in the future, the groundwork laid through collaboration will make it simplify consistent updates.

DRCOG distributing InfoGroup residential and business data

In September of 2012, DRCOG purchased business and residential data from InfoGroup (formerly InfoUSA) to supplement existing built environment data that feeds the UrbanSim Land Use Model. During the purchase, DRCOG negotiated a deal with InfoGroup that allows sharing these two datasets with DRCOG member governments and partners.

The Infogroup business and residential data are valued at \$25,000, but were offered to DRCOG partners and members at no cost.

Attributes include:

Business: Company name, address, work at home information, modeled square footage, lat/long etc.

Residential: address, demographics, own vs. rent info, sale date, sell price, year built, square footage etc.

This data covers the entire DRCOG region and is accurate for 2012.

For access to this data, please contact Ashley Summers at 303-480-6746 or asummers@drcog.org.

New additions to the Regional Data Catalog

A large amount of data was recently added to DRCOG's [Regional Data Catalog](#), including 2012-17 Transportation Improvement Project data, updated Urban Center data, and several census and boundary layers created through collaboration with Data Consortium subcommittees.

Also available are the Municipal Boundary and County boundary dataset for 2013. The Data Consortium Boundaries Subcommittee decided to use agreement points from the Colorado North Central Homeland Security Region (NCR) as a guide to resolve boundary discrepancies when creating the 2013 Regional County Dataset. The NCR Agreement Points are agreed-upon locations between counties where a road enters or leaves their jurisdiction. Boundaries were not necessarily snapped to the NCR Agreement Points. The Regional Municipal Boundary Dataset also used NCR agreement points where municipal boundaries followed county boundaries. The Agreement Points shapefile is also available on the Regional Data Catalog.

The Data Consortium Census Subcommittee was tasked with making census tables easily linkable to existing census geographies and available for download. In the Regional Data Catalog a selection of tables are now available for download in .csv format. As this is only a small selection of the census data available, future additions could depend on user demand and feedback. From the 2010 Census, the following tables are available at the Block Group and Tract levels. The Tract data covers the entire state, while the Block Group data covers the Denver-Aurora-Boulder CSA (DRCOG + Park, Elbert, & Weld Counties).

- Urban And Rural
- Occupancy Status
- Vacancy Status
- Hispanic or Latino Origin by Race
- Sex by Age



From the 2011 American Community (ACS) 5-Year Survey, the following tables are available at the Statewide Tract level.

- First Ancestry Reported
- Poverty Status In The Past 12 Months by Sex by Age
- Aggregate Travel Time To Work (In Minutes) Of Workers by Sex (Also by Place)
- Means of Transportation To Work By Age (Also by Place)
- Family Income In The Past 12 Months (In 2010 Inflation-Adjusted Dollars)
- Commuting Matrix (2010, County Level Only, No Metadata table needed)

Each of the Census and ACS tables mentioned above also have a corresponding downloadable metadata table with full field definitions. The geographies these tables link to are already available for download in the Regional Data Catalog: 2010 Census Tracts, 2010 Census Block Groups, and 2010 Census Designated Places.

Moving Open Data Forward

Article provided by Scott Primeau with OpenColorado. Scott can be reached at scott.primeau@opencolorado.org

When OpenColorado formed three years ago, one of the biggest questions about open data was "why?" Three years later, the question is "how?"

City, county, state, and federal governments across the U.S. and worldwide are seeing the value of publishing data for public consumption. You can see this in examples from Arvada, Denver, San Francisco, Cook County, IL, the U.S. federal government, and many others around the world.



Now we are working on how to make public data widely available. I use the term "public" because we are dealing with the public's data that governments hold. This data comes from citizens' and businesses' interactions with government.

Identifying, acquiring, and utilizing the knowledge, skills, and technology to publish large amounts of data is a challenge. Even for large governments that have the resources to set up a data catalog, open data competes with many other priorities, like education, health care, and public safety.

OpenColorado has been providing a solution to many of those challenges. By providing an easy-to-use, centralized data catalog OpenColorado is eliminating the infrastructure needed for governments and other organizations to publish data. Through <http://data.opencolorado.org>, an organization can upload a data set or link to a data set on the organization's servers.

Sharing data through OpenColorado builds a single source for Colorado city and county data. This allows the public to use information to build websites, apps, and other products that support commerce, entertainment, and overall well-being.

Real estate website Zillow is an example of how private citizens can develop government-held data into a useful product.

Thanks to government and private sector collaboration, entrepreneurs and innovators are developing many more tools from open data. Hack-a-thons have become a common event for governments and other organizations to promote open data and fuel business development.

Cities around Colorado have felt the hack-a-thon enthusiasm and have held several events in the past year. Starting with the Code for Communities hack-a-thon in July 2012, Colorado citizens have hacked in Longmont and at Hack4Colorado, the largest hack event on the National Day of Hacking. OpenColorado has been a proud supporter of those events and very excited to see open data coming to life.

Please visit our [website](#), check out our data, and stay in touch

Contact us

For more information on any of the topics mentioned in this newsletter or if you have an idea for an article, please contact DRCOG GIS Manager Ashley Summers at 303-480-6746 or asummers@drcog.org

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