



*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.*

## Using land cover data to determine the effects of lawn fertilizers on downstream water quality

*Article submitted by Steve Lundt, senior water quality scientist at Metro Water Recovery. Steve can be reached at 303-286-3272 or [slundt@metrowaterrecovery.com](mailto:slundt@metrowaterrecovery.com).*

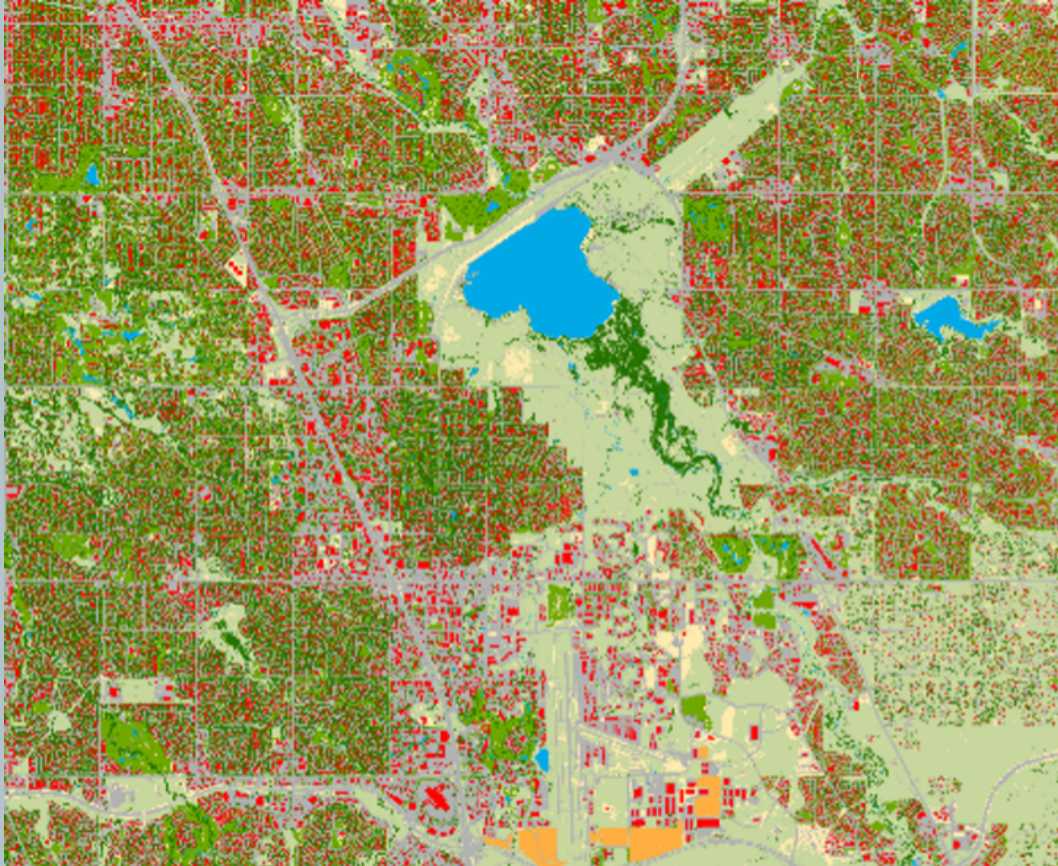
Barr Lake and Milton Reservoir Watershed Association is a nonprofit watershed group focused on reducing phosphorus loads to Barr Lake (Barr Lake State Park) and Milton Reservoir.

Its goal is to reduce nutrient loads coming from the watershed of 2.5 million people in the Denver region. Both reservoirs are vital to the agricultural community for irrigation. Barr and Milton are also used for drinking water, recreation and fisheries.

The association has identified as important a project related to source control through the use of phosphorus-free lawn fertilizers. DRCOG's 2018 land use land cover project has been vital in the efforts to estimate the amount of irrigated lawns in the urban area and how they might affect nutrient loading to the South Platte River and Barr and Milton reservoirs. Non-point sources of phosphorus from urban lawns can be enough to trigger large algal blooms during the summer.

Barr Lake and Milton Reservoir Watershed Association launched the statewide initiative to encourage lawn owners to use phosphorus-free all-purpose lawn fertilizers when it makes sense. By using the data from the land use land cover project, Metro Water Recovery was able to estimate that there are roughly 90 square miles of turf in the watershed. If a typical fertilizer of 20:10:5 was applied to those 90 square miles of lawn, it would equal close to 4,000 tons of nitrogen and another 2,000 tons of phosphorus annually.

Barr Lake and Milton Reservoir Watershed Association is building a major outreach campaign around phosphorus-free lawn fertilizers. A highly detailed understanding of land use and cover is important in showing the overall effects on downstream waters. With over 2.5 million people living in the Barr and Milton watershed, it is easy to blame water quality problems on everyone, and that can lead to the perception that the situation is hopeless. But with detailed watershed land cover data, 2.5 million people can now see that they can also be the solution to water quality problems.



## Percent area turf by jurisdiction



# Using land cover data to manage the Bluff Lake Nature Center

*Article submitted by Erickson Smith, land manager for the Bluff Lake Nature Center. Erickson can be reached at 720-440-2831 or [erickson@blufflake.org](mailto:erickson@blufflake.org).*

Bluff Lake Nature Center is a nonprofit, 123-acre wildlife refuge and outdoor classroom on the border of Denver and Aurora. Its mission:

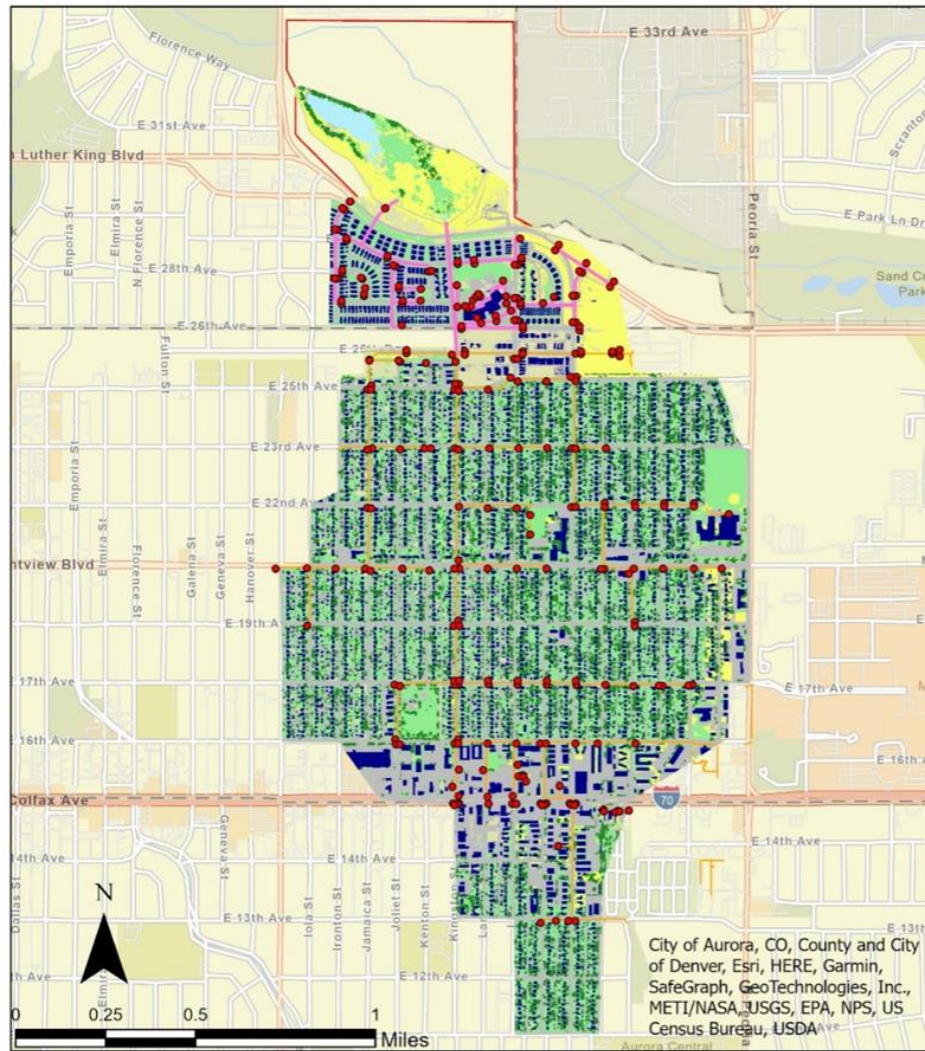
Bluff Lake Nature Center educates individuals to be engaged, resilient and curious; conserves a natural area in the city; furthers equity in outdoor access; and nurtures the health and well-being of communities and ecosystems.

Originally on the edge of the old Stapleton airport, Bluff Lake Nature Center has had a dramatic increase in development on the lands surrounding it since it became a nonprofit in 1994. The Central Park neighborhoods, industrial development and the construction of correctional facilities abutting Bluff Lake have dramatically changed land use surrounding the refuge.

Bluff Lake Nature Center's namesake, Bluff Lake, is a 9-acre lake originally constructed in the late 1800s as an irrigation pond fed by creeks. Today, Bluff Lake is fed entirely by precipitation and stormwater coming off Denver and Aurora's city streets, from a 766-acre watershed that is nearly 100% urban. Over 7 acres of cattails filter out many pollutants, and as a result, Bluff Lake provides valuable habitat in an

otherwise urban landscape for resident and migratory birds alike. The birding community has documented 226 species on-site. As Bluff Lake Nature Center finalizes its lake management plan in 2022, it has relied on geographic information systems data to contextualize Bluff Lake's water quality and pollution-related impairments.

Bluff Lake Nature Center staff consider DRCOG's 2018 land use land cover project invaluable in quantifying the various types of land use within Bluff Lake's watershed and determining metrics that are essential for lake health, such as the proportions of impervious surfaces and lawns. The data will also help identify areas within the watershed that may have a significant effect on the lake should a chemical or fuel spill happen there. Finally, as Bluff Lake Nature Center staff considers public outreach and education efforts concerning the use of phosphorus-free fertilizers on lawns, the land use land cover data will help them identify the largest concentrations of lawn within the watershed. As a nonprofit, having access to high-resolution land use land cover data has allowed Bluff Lake Nature Center personnel to understand its relationship with its surroundings better than they would have been able to elucidate on their own.



- Storm Drains
- Denver Storm Mains
- Aurora Storm Mains
- Barren Land
- Cropland

- Impervious Surfaces
- Prairie/Grassland/Natural Cover
- Structures
- Tree Canopy
- Turf/Irrigated Land
- Water

Prepared by: Erickson Smith  
Date prepared: 2/15/2022  
Data Sources: City and County of Denver, City of Aurora, DRCOG, ESRI  
Map Datum: WGS 1984  
Projection: UTM Zone 13N

## The City of Longmont launches an impervious surface dashboard

Article submitted by Brett Rosso, GISP, senior GIS analyst at the City of Longmont. Brett can be reached at 303-651-8311 or [brett.rosso@longmontcolorado.gov](mailto:brett.rosso@longmontcolorado.gov).

In 2016, City of Longmont leadership requested that the geographic information systems team investigate ways to calculate pervious vs. impervious surface on a parcel level. The city wanted a general idea of the average percent of pervious and impervious surface per Longmont land use category.

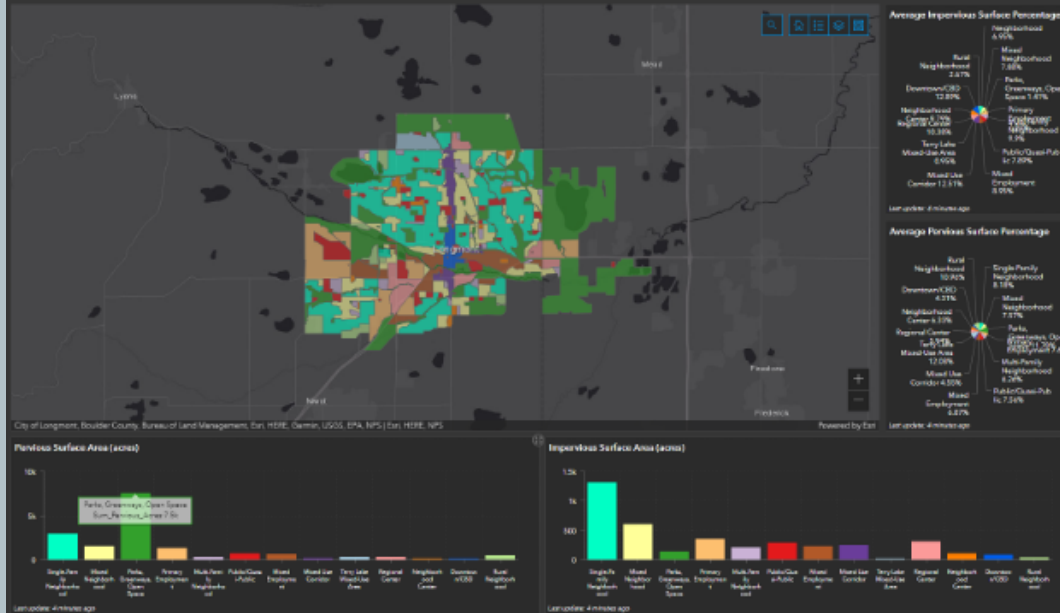
Thanks to the Babbit Center and DRCOG, the GIS team was able to use the land cover data that included impervious surface, structures, driveways, water and other class types.

The GIS team combined all pervious types of land use to create a single contiguous piece of pervious surface. The team then overlaid parcels for Boulder and Weld counties that covered the regional planning area and city limits. The parcels were then used as clip features to slice the impervious and pervious surfaces.

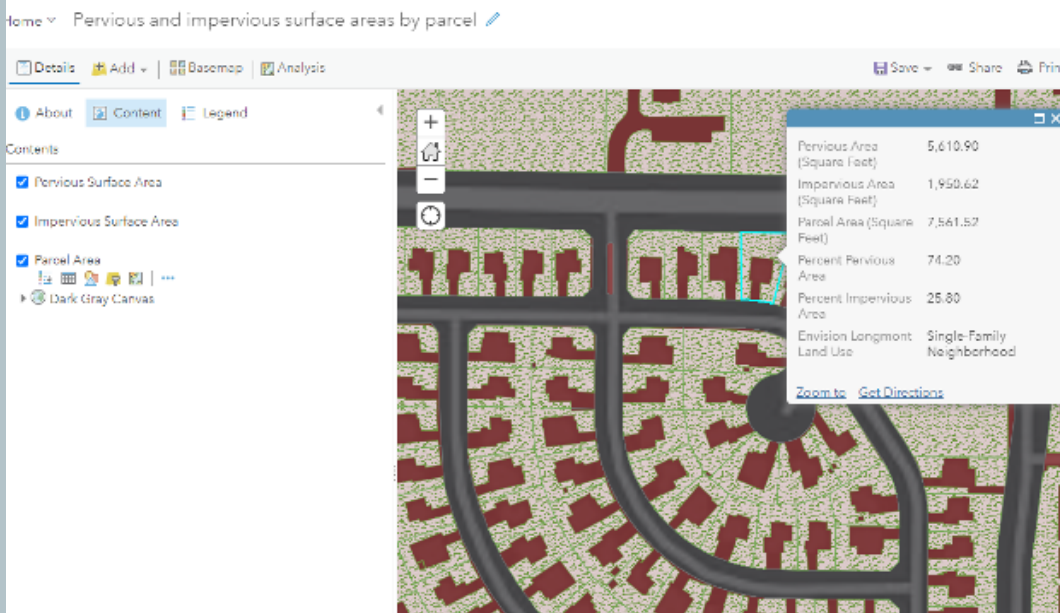
Next, the team made calculations in fields within the parcel layer for impervious and pervious square footage. The team calculated the percentage of each pervious and impervious surface per parcel area. The team then made a spatial join of land use data to the parcels and summarized data on the parcels to determine average percentage of pervious and impervious surface per land use type.

After all the data was in one place, the team inserted the datasets into the city's ArcGIS enterprise geodatabase and published them with the ArcGIS server into ArcGIS online.

Finally, the team compiled all the data into a dashboard for viewing the data by land use type. When users zoom in and out, widgets automatically recalculate within the map view.



The team also created a parcel level viewer for users to investigate pervious and impervious surface areas and percentages.



The dashboard and viewer have been well-received and will be updated with newer data in the future. Although still in the planning stage, the application and data may also be used to determine new stormwater rate fees based on impervious surface.

The GIS team is grateful to the Babbit Center and DRCOG for allowing it access to this valuable dataset to be able to develop this project for the City of Longmont.



# You're invited to beta test EnviroScreen

*Article submitted by Margaret Horton, environmental epidemiologist at Colorado Environmental Public Health Tracking. Margaret can be reached at [margaret.horton@state.co.us](mailto:margaret.horton@state.co.us).*

Colorado EnviroScreen, the state's new environmental justice mapping tool, will be open for public beta testing from April 18 to May 1.

Colorado EnviroScreen will enable users to identify disproportionately impacted communities based on the definition in [Colorado's Environmental Justice Act](#) (House Bill 21-1266) in order to maximize funding and resources for efforts to avoid, reduce and repair environmental harms. For example:

- The Environmental Justice Advisory Board at the Colorado Department of Public Health and Environment will use EnviroScreen to determine where to distribute environmental justice grants created by the new law.
- The Colorado Department of Public Health and Environment and the U.S. Environmental Protection Agency's [Memorandum of Understanding](#) will prioritize enforcement and compliance in disproportionately affected communities identified through tools like EnviroScreen.

Visit the [EnviroScreen web page](#) starting April 18 to test and provide feedback on the tool.

The Colorado Department of Public Health and Environment

and a team from Colorado State University are developing the tool.

All Coloradans, especially people who live in communities disproportionately affected by environmental health risks, also are invited to join a virtual community meeting from 6-7:30 p.m. on Monday, April 25, to see a demonstration of and give feedback on Colorado EnviroScreen. [Sign up for the meeting.](#)

[Sign up for the meeting](#)

## Update on the Colorado State Plane Coordinate System of 2022

*Article submitted by John Hunter, global navigation satellite system coordinator at Denver Water. John can be reached at 303-634-3519 or [john.hunter@denverwater.org](mailto:john.hunter@denverwater.org).*

The Colorado State Plane Coordinate System of 2022 was originally set to be released in 2022, but due to several factors such as COVID-19, the release has been delayed. No official release date has been set. However, industry speculation suggests a release date in 2025 or 2026 is likely. Denver Water will keep its partners, including readers of this newsletter, posted as more information is made available.

The Colorado State Plane Coordinate System of 2022 will differ from the current State Plane Coordinate System (State Plane Coordinate System 83) in that it will be moving from

three zones to 36 total zones made up of one statewide zone (Image 1) and 35 smaller local zones (Image 2).

Image 1: Proposed Colorado statewide zone

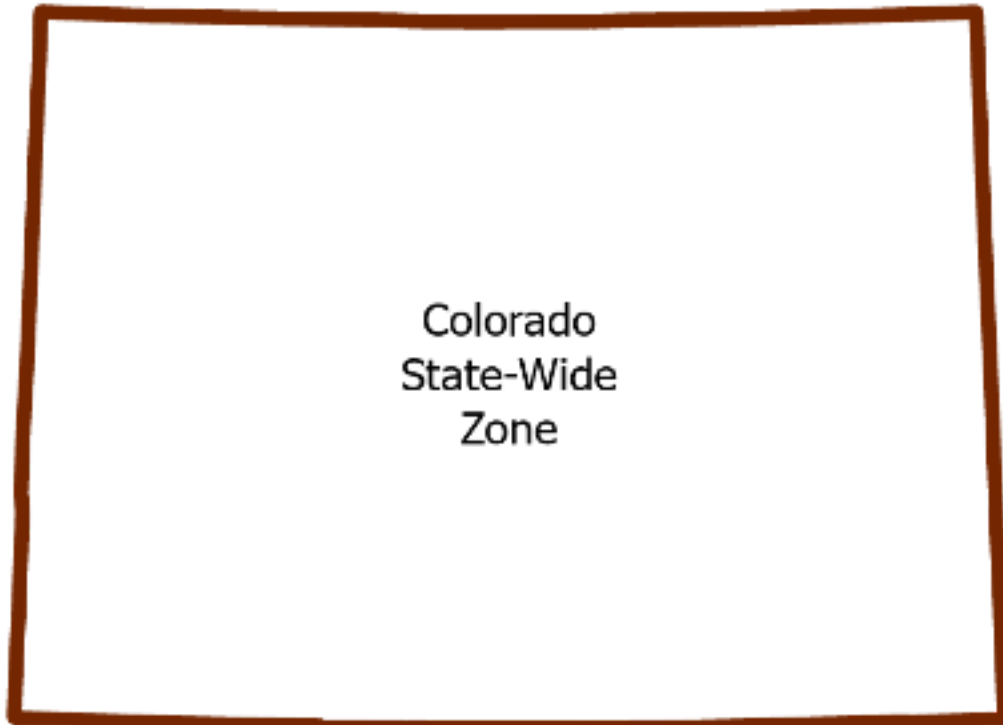
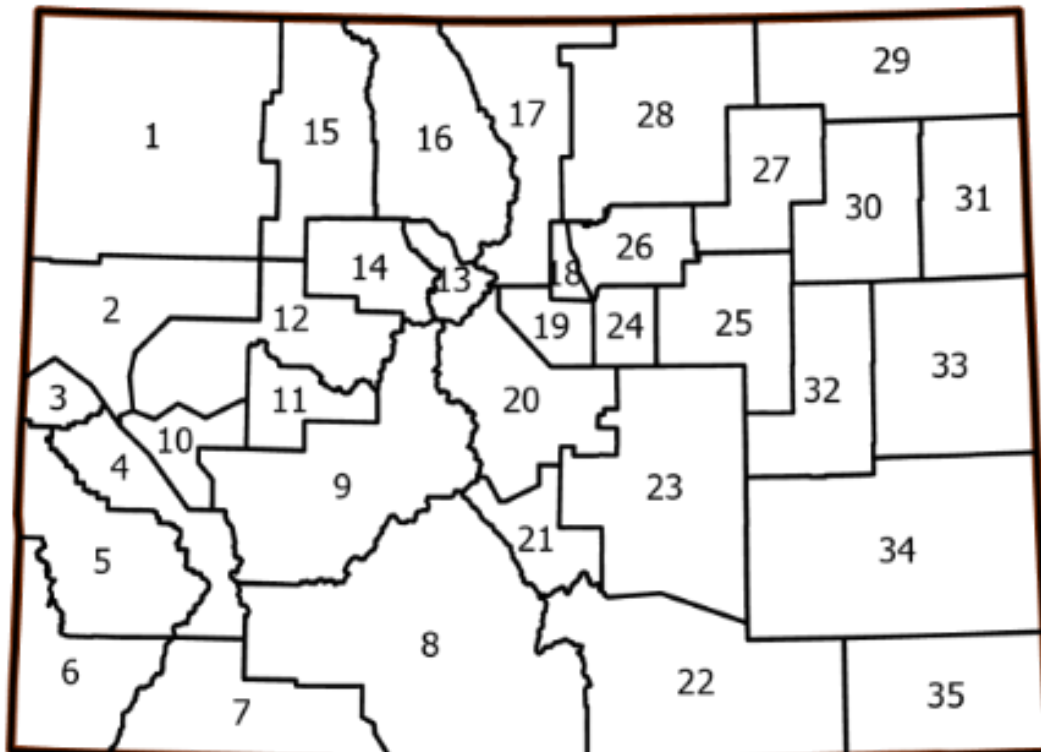


Image 2: Proposed 35 local zones



The statewide zone is geared more for GIS general use, whereas the local zones are geared more for the surveying, engineering and scientific communities that may require a higher degree of precision in terms of mitigating the effect of mapping distortion in their work. You may be thinking 36 zones is a lot to keep track of, and it is. No doubt, the new system will require more user diligence than the current system. However, the new system works for the majority of the geospatial community. For example, high accuracy mapping, surveying, geomatics and engineering cannot use the current system without modification. The good news is that all these zones will be in users' coordinate system library in all major geographic software applications such as Esri.

All coordinate system zone definitions have been submitted to the National Geodetic Survey for its review. Denver Water does not anticipate any changes in what was submitted other than, perhaps, coordinate values. The Geodetic Coordination team has an [ArcGIS Online web experience called "Colorado Geodetic Coordination Website"](#) where you can find more information about Colorado State Plane Coordinate System and the modernization of the National Spatial Reference System.

## Surveyors needed for Marshall Fire recovery

The Marshall Fire catastrophically affected the communities of Louisville and Superior at the end of 2021. DRCOG has reached out to both communities to provide support and identify their needs for assistance. One challenge that staff have identified is a lack of surveyors. Site surveys are a critical first step in the rebuilding process, but the survey efforts are delayed due to an inability to find certified surveyors that are

immediately available to work. If you are a surveyor interested in helping the communities recover, please reach out to Flo Raitano at DRCOG at [fraitano@drcog.org](mailto:fraitano@drcog.org).

Contact Flo Raitano

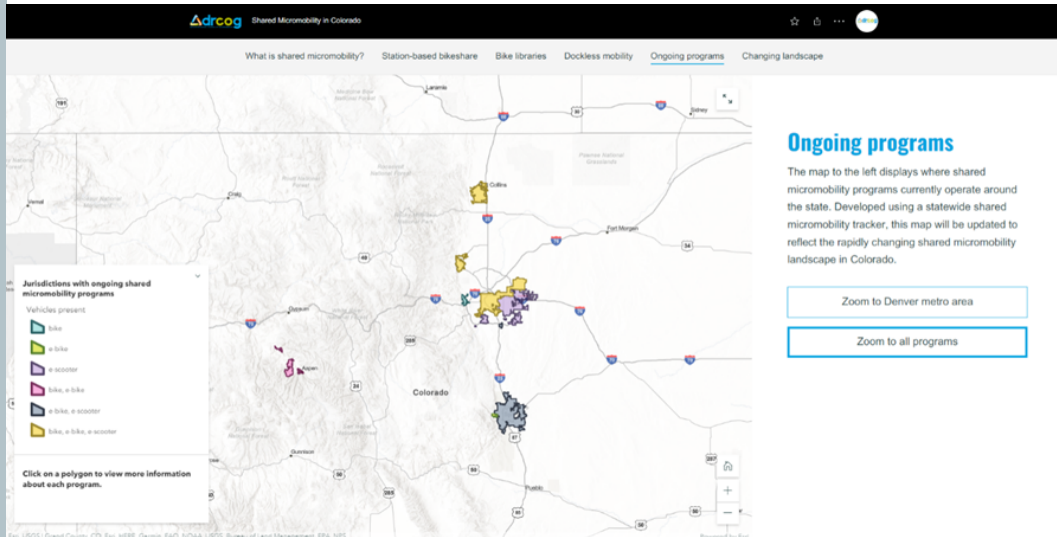
## Shared micromobility in Colorado story map

*Article submitted by Rachel Pierstorff, GIS specialist at DRCOG. Rachel can be reached at 720-278-2340 or [rpierstorff@drcog.org](mailto:rpierstorff@drcog.org).*

Shared micromobility refers to shared, low-speed, lightweight, small human- and electric-powered transportation solutions. The solutions can include station-based bike sharing, dockless bikes and e-bikes and devices like e-scooters. In December 2020, the regional Micromobility Work Group developed a document detailing [shared micromobility in the Denver region](#), including considerations for local agency implementation and regional consistency. In fall 2021, DRCOG worked with partners through the subgroup to inventory shared micromobility programs throughout Colorado; [the inventory is available in a Google spreadsheet](#).

DRCOG staff used the inventory to develop an ArcGIS StoryMap, an interactive web map, to describe and display shared micromobility programs throughout the state. The interactive product describes the state of shared micromobility in Colorado, along with information about various shared micromobility programs in operation. Three

maps display the status (ongoing, piloting or discontinued) of shared micromobility programs of three types: station-based bike-sharing programs, bike libraries and dockless mobility. The final map displays all jurisdictions containing ongoing programs, symbolized by the vehicles present (bikes, e-bikes and e-scooters).



Please check out the [Shared Micromobility in Colorado story map](#). As always, DRCOG staff welcomes and appreciates feedback!

## DRCOG data acquisition updates

*Article submitted by Ashley Summers, GISP, PMP, information systems manager at DRCOG. Ashley can be reached at 303-480-6746 or [asummers@drcog.org](mailto:asummers@drcog.org).*

### Denver Regional Aerial Photography Project 2022

Contracts are in place with Sanborn and Nearmap to provide imagery to DRCOG's project partners in 2022 and 2023.

Sanborn will be flying custom imagery of the [6,000-square-mile Denver region](#). Flights to collect the Front Range have begun. Flights to collect the mountainous area will occur in June and July. Imagery will be delivered to partners in the first quarter of 2023 and will be in the public domain in early 2025.

Nearmap is offering a subscription to DRCOG partners that includes access to four imagery captures over the next two years. The data is for internal use only.

If you are not a project partner and would like to be, reach out to me at [asummers@drcog.org](mailto:asummers@drcog.org). Read more about DRCOG's [imagery projects](#) on the [website](#).

## Regional Lidar Project 2020

DRCOG received a grant from the U.S. Geological Survey in December 2019 to collect quality level 2 lidar in 5,000 square miles of the region and derive contours in most of the Denver metro area. Flights to collect the data were completed between May 26, 2020, and Sept. 7, 2020, and quality control performed by the U.S. Geological Survey was completed in December of 2021.

Point clouds and bare-earth digital elevation models are available to download from DRCOG's Regional Data Catalog by tile. You can also download the index by going to Get Data/Shapefile and the metadata by going to Get Data/Supplemental Information.

- <https://data.drcog.org/dataset/2020-q1-lidar-index-in-co-sp-central>
- <https://data.drcog.org/dataset/2020-q1-lidar-index-in-co-sp-north>
- <https://data.drcog.org/dataset/2020-q2-lidar-index-in-co-sp-central>

- <https://data.drcog.org/dataset/2020-ql2-lidar-index-in-co-sp-north>

Lidar can also be downloaded from the National Map. These datasets will be in Universal Transverse Mercator.

If you would like a hard drive to be filled with the entire dataset, you can send an empty hard drive to the Governor's Office of Information Technology. For requests small enough to be transferred another way, please use [this form](#) or contact [this email address](#).

Contours are still being processed and DRCOG staff anticipates they will be done by the end of the month. When available, these datasets will also be posted on DRCOG's Regional Data Catalog.

The Colorado Water Conservation Board has made its lidar data download portal live, and [it can be accessed here](#).

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

Do you have an interesting use case for lidar data? [Tell us about it by emailing me](#) at [asummers@drcog.org](mailto:asummers@drcog.org).

## Planimetric Data Project 2020

The planimetric data project began in February 2021 and deliveries began in June 2021. Building roofprints, edges of pavement, parking, sidewalks and ramps, trails, driveways, and impervious surface were collected throughout the metro area. [Check out the map](#).

[Download the latest data](#).

If you are not a project partner and would like to be, reach out to me at [asummers@drcog.org](mailto:asummers@drcog.org). Read more about



the [planimetric data projects](#) on the [website](#) and [download datasets](#) from past projects.

## Regional Land Cover Project 2020

DRCOG was awarded a Colorado Water Conservation Board Water Plan Grant in March 2021, which supplies a 50% match to local contributions for the project. The project kicked off in June 2021 with a presentation from Sanborn and the University of Vermont regarding the “[interpretation key](#),” an illustrated guide to classification schema.

The product will be a 9-class, 1-meter resolution land cover dataset that covers the 6,000-square-mile Denver region. Deliverables are expected in early May 2022 and will be made publicly available on DRCOG’s Regional Data Catalog.

If you are not a project partner and would like to be, reach out to me at [asummers@drcog.org](mailto:asummers@drcog.org). You can stay apprised of project happenings on the [website](#).

## Engage with us

- This quarterly newsletter reaches more than 400 people, has a higher-than-average open rate, and is written by professionals like you. It is the perfect place to show off your projects, highlight your work and contribute ideas to the GIS community in the Denver region. Newsletter release dates are the 15th of January, April, July and October (or the next business day). Please contact Ashley Summers at 303-480-6746 or [asummers@drcog.org](mailto:asummers@drcog.org) to contribute.
- Did you miss a newsletter or a meeting? [Visit our website](#) for past newsletter issues and Data Consortium meeting materials.



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