



*The data consortium comprises Denver Regional Council of Governments members and regional partners interested 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.*

## Urbanization's effects on streamflow in the Denver area

Article submitted by Aditi Bhaskar, associate professor of civil, environmental and architectural engineering at the University of Colorado Boulder. Aditi can be reached at [aditi.bhaskar@colorado.edu](mailto:aditi.bhaskar@colorado.edu).

Data from DRCOG on land cover, aerial photography and elevation is important for researching how urban development affects water resources in the Denver area.

Urban development strongly affects the amount of water in streams during dry periods and after storms but has mostly been documented in cities with wet climates. There is a lack of knowledge regarding the impact of urbanization on streams in dry-climate cities.

Excessive lawn watering can affect urban streams during periods of drought, either by overwatering plants or by misaimed sprinklers hitting sidewalks or driveways. [Water Resources Research published an article](#) that utilized a new method to estimate the stream flow amount originating from excess lawn irrigation using a tracer that distinguishes between tap water and local rain. This approach examined 13

urban streams and two grassland streams in 2019. Tap water accounts for over 65% of urban stream flow during dry weather. Lawn irrigation was a larger water source than leaking water pipes in the streams. Urban streams typically flow all year, whereas grassland streams experience less streamflow and dry out for part or most of the year.

Turning to storm events, in an [article published in Hydrological Processes](#), the authors found that in the Denver area, urbanization increased the responsiveness of streamflow to small rain events. This increased responsiveness resulted in urban streams experiencing more frequent stormflow, increased peak streamflow and a shorter elevated streamflow time after a storm.

In an [article published in Multidisciplinary Digital Publishing Institute Water](#), the authors discussed how altered storm responses affect roadway flooding and travel delays. Analysts then investigated the impact of green stormwater infrastructure on the Harvard Gulch watershed in Denver.

Analysts use DRCOG data to enhance the protection of water resources in the Denver region by providing information on new developments and changes to existing ones.



# Using ArcGIS to collaborate across organizations

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Modern geographic information systems technology allows organizations and platforms to share authoritative data easily. Sharing information across organizations promotes transparency and collaboration. Additionally, it reduces the need to develop and store redundant content. More recently, adopting cloud-based ArcGIS software has facilitated internal collaborations, enabling organizations to share sensitive or confidential data and engage in joint data development initiatives.

There are two types of collaborations depending on the utilized infrastructure. A ***distributed collaboration*** allows organizations to connect their installations of ArcGIS Enterprise Portal or with ArcGIS Online. You can set up ***Partnered collaborations*** across ArcGIS Online organizations. Specific organization members can access content in the collaboration workspace or associated groups.

## Collaborating within a County (Portal to ArcGIS Online)

Jefferson County recently installed ArcGIS Enterprise Portal to promote geographic information systems by making it more accessible to county employees. Before this, Jefferson County was utilizing ArcGIS Online, which limited the number of users and available content due to storage constraints. However, the Jefferson County Open Data Hub relies on publicly shared content through its ArcGIS Online organization. To avoid publishing duplicate content, the Jefferson County Business Innovation and Technology geographic information systems team set up a distributed collaboration between their new Enterprise Portal and their existing ArcGIS Online organization, allowing content to be sourced directly from their local database through ArcGIS Enterprise and out to ArcGIS Online for open data sharing.

The content passes *through* ArcGIS Online without being hosted, eliminating the need for storage credits or copies of data.

## Collaborating beyond a County (Portal to Portal)

Jeffcom911 is a regional emergency communications center responsible for dispatching services to various law enforcement, fire and emergency medical agencies operating within and beyond Jefferson County lines. Traditionally, Jefferson County primarily managed spatial data relevant to emergency response and emergency operations planning. However, recently, there has been a shift towards a more decentralized approach, with Jeffcom911 assuming a more prominent role in geographic information systems capacity and data management. Consequently, Jeffcom911 has substantially enhanced its geographic information systems capabilities to better align with the evolving requirements of emergency response efforts. As part of this transformation, Jeffcom911 and Jefferson County have established a Portal-to-Portal collaboration, enabling the seamless exchange and access of sensitive emergency-related data between the two entities.

## Collaborating across a region (ArcGIS Online to ArcGIS Online)

DRCOG partners with many regional government agencies to maintain updated aerial imagery and associated planimetric data. With the development of an updated planimetric associated with the 2022 aerials, DRCOG utilized partnered collaborations through ArcGIS Online to allow member governments access to the preliminary data. Through collaborations, members can access an interactive web mapping application designed for data review and quality assurance.

These are just a few examples of how ArcGIS distributed and partnered collaborations streamline data sharing to promote collaboration and efficiency across organizations.

# Regional Vision Zero story map collection

*Article submitted by Rachel Pierstorff, geographic information systems specialist at DRCOG. Rachel can be reached at 720-*

Adopted by the DRCOG Board in June 2020, [Taking Action on Regional Vision Zero](#) establishes a target of zero fatalities and serious injuries on the Denver region's transportation system and defines what objectives and action initiatives will be required to accomplish this goal. These actions help local governments strategically reduce and eliminate fatal and serious injury crashes. The plan also includes intensive data analyses of fatal and serious injury crash statistics from 2013 to 2017, categorized by each crash's area type: urban, suburban, rural or limited access highway.

In creating a story map version of Taking Action on Regional Vision Zero, DRCOG staff organized the data and information in an ArcGIS StoryMap Collection. A collection comprises individual StoryMaps containing narrative text, embedded web maps and visual media. For the Regional Vision Zero content, DRCOG staff created a StoryMap for each area type from the original plan and broke down each crash profile within those StoryMaps. Each crash profile pairs context and statistical information with a map of crashes belonging to that profile. As the user zooms in on the map, the symbology switches from regular points to clustered points to better sense where that crash type is particularly prevalent. DRCOG staff also use Infogram graphics to show the share of each crash type within all crashes.

The Regional Vision Zero StoryMap Collection is the first time DRCOG staff meaningfully implemented unprecedented accessibility features and design choices. DRCOG is subject to House Bill 21-1110 and Senate Bill 23-244 and has started integrating accessibility features into more of its web maps, StoryMaps and other online geographic information systems products. New and improved accessibility elements in the Regional Vision Zero StoryMap Collection include vision-deficiency-friendly symbology, color schemes, and alternative, e-reader-friendly text elements.

Please check out the [Regional Vision Zero collection](#). As always, DRCOG staff welcomes and appreciates feedback at [geospatial@drcog.org](mailto:geospatial@drcog.org).

**Regional Vision Zero**

Working towards zero fatalities and serious injuries on the Denver region's transportation system.

**Get started**

This story map explores the fatal and serious injury crash trends in the Denver region, breaking down where these crashes are occurring on the regional roadway system and the top contributing factors. Analyzing the patterns in the data shows where crashes occur, how they happen, and help determine which countermeasures will make the biggest impact.

- 1 Taking Action on Regional Vision Zero
- 2 Urban areas crash profiles
- 3 Suburban/compact communities crash profiles
- 4 Rural areas crash profiles
- 5 Limited-access highway crash profiles
- 6 Behavior profiles
- 7 Implementing Vision Zero

## 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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