



# COLORADO

## Governor's Office of Information Technology

**State:** Colorado

**Agency:** Governor's Office of Information Technology

**Award Category:** Data Management, Analytics & Visualization

**Project Title:** Reimagining Colorado's Broadband Maps

**Project Dates:** October 2022 - February 2023

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## EXECUTIVE SUMMARY

The need for accurate and easy-to-use broadband maps has never been higher. In June 2022, the [Colorado Broadband Office](#) (CBO) with the Governor's Office of Information Technology was tasked by Gov. Polis in [Executive Order D 2022 023](#) to connect 99% of Colorado households to high-speed broadband by 2027. To achieve this goal, we knew that we must understand the availability of high-speed internet service across the state and make location-based data available to ALL stakeholders for use in developing accurate and effective broadband plans. Faced with this reality, our team also recognized that an overhaul to the Colorado Broadband Map was necessary.

On Feb. 16, 2023, we launched the [Colorado Broadband Office Mapping Hub](#) (Hub), an easy-to-use resource for the public, internet service providers (ISPs), schools, communities and businesses around Colorado for their broadband education and planning purposes.

In the Hub, we leverage multiple data sources for analysis, reporting and decision-making. This new mapping platform goes beyond being "just a map" by including user-focused applications, maps and dashboards for broadband resource and mapping discovery:

- [Colorado Broadband Mapping Hub](#)
- [Colorado Broadband Map](#)
- [Grant Awards Dashboard](#)
- [Grant Discovery Portal](#)
- [Speed Test and Survey](#)

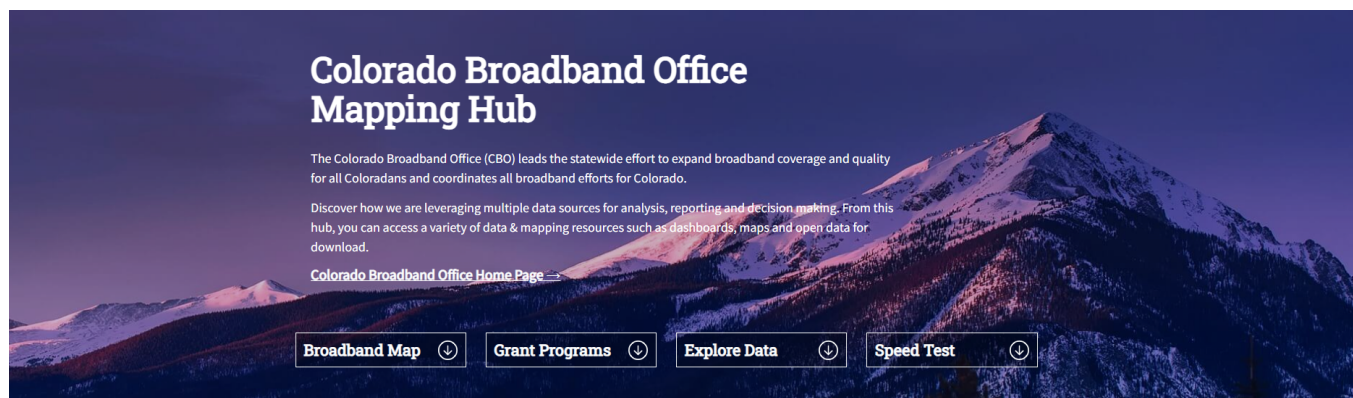
### Declarations from Executive Order D 2022 023:

A. Reliable broadband service is critical for anyone working or studying from home or accessing business, government, or healthcare services that are increasingly available online.

B. Fast, reliable, and affordable broadband access is critical to attracting, recruiting, and retaining a quality workforce across the State.

C. Colorado must leverage funding opportunities and partnerships with local, State, and federal governments, including ARPA and IIJA, communities, private industry, and other relevant organizations to ensure Colorado has robust and scalable broadband infrastructure.

D. Colorado's Goal of providing 99% of Colorado households with access to reliable, high speed broadband by December 31, 2027 will spur economic growth and provide meaningful support to individuals and families across the state.



## IDEA

The Broadband Hub and Maps are game-changing resources for internal and external broadband stakeholders including CBO broadband grant reviewers, staff and applicants; the Governor's Office;

legislators; ISPs; schools; communities and community leaders; businesses; residents; and the media. To maximize upcoming historic federal broadband funding, we needed to truly understand Colorado's broadband landscape. We also needed to ensure we are on the same page with all stakeholders for the sake of efficiency and transparency in our work.

The map and resources our team had in place prior to the inception of this project were not sufficient for navigating the internet service availability landscape to make effective decisions given the new, high stakes. The old map was not meeting the needs of our stakeholders, as evidenced by the questions we consistently received on how to use and decipher the map. We identified a need for mapping and data discovery, giving stakeholders the necessary tools to gain a deeper understanding of their own broadband scenarios and helping them to make better decisions.

Currently, 88.8% of Colorado households are connected to high-speed broadband (100/20 Mbps), and Governor Polis has directed that 99% of Colorado households be connected to high-speed broadband by 2027. Bridging this gap to achieve the Governor's vision requires a clear and concise plan with supporting data for all stakeholders and also requires giving collaborators the right tools, resources and information. Our new, more granular maps, which feature connectivity metrics and associated grant award and application data, inform Coloradans and decision-makers, enabling them to collaborate on bridging the digital divide in their communities.

Our new Broadband Mapping Hub and Maps are not only innovative tools; they are unique in the field of state broadband mapping. Many states do not have a state broadband map and must use the [FCC National Broadband Map](#) and other publicly available tools for their in-office mapping needs. Other state broadband maps typically consist of a single map displaying basic data where the user needs to learn how to derive the desired information. Colorado's new Broadband Maps are more comprehensive and experience-based to suit each type of user (member of the public, grant reviewer or applicant, decision maker, legislator, etc.). The combination of maps and dashboards to meet user needs and allow for user analysis is unique in this field. Our new Colorado Broadband Mapping Hub offers:

- A well-organized and clear Broadband Mapping Hub that acts as a landing page for the user and houses all maps, applications and dashboards.
- The Colorado Broadband Map for all stakeholders who want to learn about broadband coverage in their area of interest. The map allows users to view broadband coverage by their desired location. The "search service in my area" functionality lets users search an address to find internet service providers that offer service at that location, find grant applications and awards that impact that location and find speed test data administered in the area.
- The Grant Awards Dashboard displays broadband grants (applications and awards) and features metrics, graphs, maps and data tables. Grant information is broken down and filterable by fund, year, geographic area and application number.
- The Grant Discovery Portal is a tool stakeholders can use to apply for funding. Grant applicants can view program eligibility guidelines and find resources to prepare applications. It includes state and federal broadband grant layers, broadband coverage data and demographic data. The Portal also allows users to place queries on broadband coverage data for further analysis. Stakeholders can also upload GIS Data in this portal to support a CBO grant program application.

- Anyone can access and take the Colorado Broadband Office Speed Test and Survey, which allows residents to test their home or business internet speed and share valuable information directly with the CBO. The Speed Test and Survey collects the following information:
  - Can be used to report locations with no service
  - Learn what broadband service is available at a given location
  - Conducts a speed test at a given location

The feedback we've received since launching the Broadband Mapping Hub and Maps in February tells us the Hub is a model for other states as they begin developing their broadband mapping programs.

The Broadband Mapping Hub features data that is built upon FCC Broadband Data Collection (BDC) Map data, which is the federally recognized authority on broadband data. We are working to augment the FCC dataset with our own office-collected broadband coverage data (to be published in May 2023) to offer the most accurate account of broadband data in Colorado. Since our maps are built upon this nationally mandated dataset, the Colorado Broadband Maps are universally understood and, as mentioned above, can be used as a model for other broadband programs.

## IMPLEMENTATION

This project was developed over the course of a year by the CBO Data Team. The team spent many sessions brainstorming and conceptualizing a resource that meets the need for a transparent, user-led, discovery-based mapping tool that will help drive and support disbursement of the historic amounts of upcoming broadband funding from our office. Our team has years of experience working directly with the stakeholders who would become users of our new maps. Therefore, we were able to keep stakeholder needs at the forefront of our minds throughout the development of our new mapping tools.

The Hub will continuously be assessed by a broad number of users as large amounts of federal funding will be disbursed from our office over the next five to seven years. The Broadband Mapping Hub directly supports all CBO funding decisions and as such, we have a constant, internal gauge as to its effectiveness. Additionally, external users such as internet service providers, members of the public and decision-makers rely on these maps to inform their decisions regarding broadband access and infrastructure implementation. Our office communicates daily with these external stakeholders and regularly holds check-in meetings to ensure we are on track to meet our goals. Our Broadband Mapping Hub is under constant scrutiny and assessment, internally and externally.

We used input from various stakeholder groups throughout this project's development and implementation:

- Internal CBO members (advocates, oversight, end-users and beneficiaries): During project conception, we held meetings and brainstorming sessions with various CBO teams and team members (grant staff, compliance officers, communications, etc.) who would be using our maps to support their work. We asked what functionality they needed in the new maps and what wasn't working with our old maps. As the project progressed, we continuously checked in with these CBO members on updates and development to ensure we captured their needs. Prior to the project launch, CBO members participated in testing to provide user experience

feedback. We did not have to market this project to this group since a successful product would greatly benefit their daily work.

- Governor's Office (end-users and beneficiaries): We worked directly with the Governor's Office throughout the duration of this project (conception and testing) to ensure our product aligned with and supported the Governor's goals and mission. Again, this project did not need to be sold to this group since our success directly supports their initiatives.
- Vendors (implementation): We worked closely with our mapping vendor to ensure our ideas and vision were represented and that our new maps were intuitive and easy to use for each type of potential user. Our success with this project equated to a job well done for our vendor.
- Industry and Community Leaders (end-users, beneficiaries): As mentioned above, we have ongoing discussions with these groups and have a comprehensive understanding of their mapping and data needs. We were able to incorporate these pieces into the entire life cycle of the project. With these groups, we have very specific marketing strategies geared toward gaining their trust and adoption of our new maps. Sharing the message that our success with this project will benefit all of our stakeholders (by providing an accurate account of broadband coverage and an interactive platform to access data for their own needs) was very important to their adoption of this project. Support of external stakeholders, such as the public, is crucial for the success of the project.

This project required significant financial, time and human resources. Funding was secured through federal sources that supported a prior year Wildly Important Goal (WIG) called Expanding Broadband Access. Aside from procuring funding and the administrative tasks associated with securing our vendor, the Colorado Broadband Office's data team put many hours into developing the Broadband Mapping Hub and Maps. Over the course of six months, the five-person data team dedicated at least 1.5 hours each week to meeting with our vendor for planning/product development. In addition, the data team spent many hours creating content, gathering feedback, developing data and workflows, user testing, and planning for the product launch. After launch, we have dedicated time for testing, knowledge transfer, awareness, and training for stakeholders.

The technical architecture of our project defines how it is delivered. Our team has attended numerous training sessions to understand the technical architecture and gain a foundation on how to best improve upon and creatively enhance our product. We are using the most current and cutting-edge geospatial visualization programs and methodologies and are working closely with the vendor to push the envelope not only on what we can produce visually or functionally but also on discovering new, creative ways to approach a problem that makes the most sense for our team and goals.

## IMPACT

Why does this project matter?

- Our stakeholders rely on us to get the maps right.
- It's a crucial step in achieving high-speed internet coverage for 99% of Colorado households.
- Coloradans deserve to be informed and to have a voice in this massive undertaking.
- It is necessary to accurately deploy millions of federal dollars for broadband infrastructure and accessibility in Colorado. The CBO has the responsibility to distribute a lot of money in an efficient and impactful way. The Broadband Mapping Hub lays the foundation for this mission.



We have put the work and research in to deliver the best, most cutting-edge resource for all users.

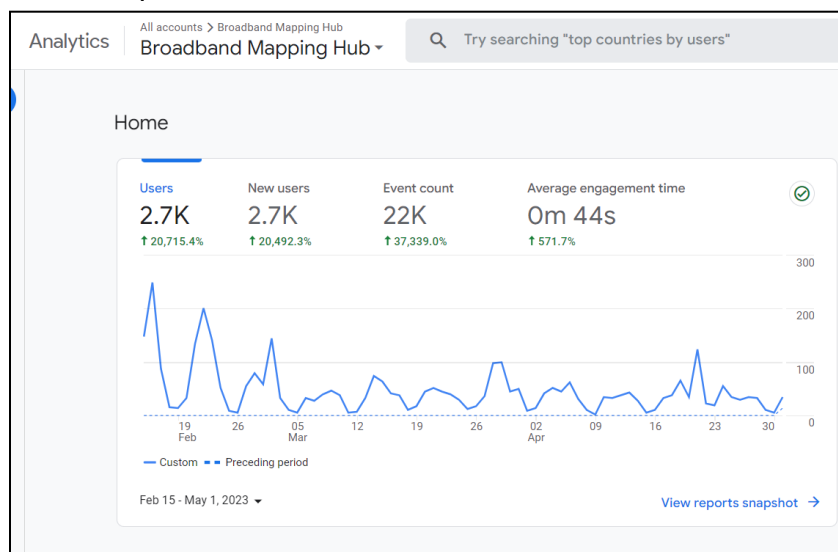
Before this project was completed, our stakeholders made decisions based on our old map, which had limited functionality and required users to rely on their level of geospatial savviness to derive the information they needed. This was limiting and led to misinformation and confusion. With the new Mapping Hub, we have simplified the process and have built experiences and dashboards to prioritize user stories and ease of navigation.

The Colorado Broadband Maps highlight our Office's dedication to finding the most clear way to connect 99% of Colorado households to high-speed internet through clear and concise data visualizations, data management, sharing and analytics. We have successfully transformed broadband data into insights and accessibility for decision-making.

News articles and media features of the Broadband Mapping Hub:

- [GovTech: What's New in Digital Equity: Colorado Launches Broadband Mapping Hub](#)
- [StateScoop: Colorado Broadband Office launches online hub to find funding](#)
- [GCN: Inside one state's decade-long effort to map broadband availability](#)
- [YouTube: A Look at Colorado's State Broadband Hub and Map](#)

The following clickable screenshot shows analytics for our Broadband Mapping Hub webpage. Since the Hub was published on Feb. 15, 2023, there have been nearly 27,000 users; our current average is five users per minute.



The next clickable screenshot shows many users exist outside of Colorado, potentially supporting the notion that other states are using our Hub as a model for their work. After the launch of the Hub, our vendor shared feedback they received, saying: "I was told by other states that they have 'map envy' of Colorado."

All accounts > Broadband Mapping Hub

Broadband Mapping Hub - Try searching "top countries by users"

shot + Demographic details: City - Feb 15 - May 1, 2023

		2,706 100% of total	2,677 100% of total	2,418 100% of total	53.87% Avg 0%	0.89 Avg 0%	0m 44s Avg 0%	22,089 100% of total	0.00
1	Denver	395	357	401	57.78%	1.02	0m 48s	3,417	0.00
2	(not set)	212	196	142	51.08%	0.67	0m 37s	1,406	0.00
3	Ashburn	187	174	8	4.19%	0.04	0m 01s	902	0.00
4	Colorado Springs	82	81	81	72.32%	0.99	0m 40s	633	0.00
5	Lakewood	76	71	72	77.42%	0.95	0m 49s	511	0.00
6	Moses Lake	68	65	24	35.29%	0.35	0m 09s	287	0.00
7	Cheyenne	64	62	27	42.19%	0.42	0m 09s	284	0.00
8	Lansing	53	53	38	62.3%	0.72	0m 25s	307	0.00
9	Aurora	49	43	44	58.67%	0.90	0m 31s	358	0.00
10	Boulder	38	31	29	55.77%	0.76	1m 03s	295	0.00
11	Los Angeles	38	36	12	23.08%	0.32	0m 14s	204	0.00
12	Englewood	36	34	30	71.43%	0.83	0m 41s	221	0.00
13	Phoenix	33	29	18	40.91%	0.55	0m 24s	190	0.00
14	Westminster	33	30	29	58%	0.88	0m 47s	254	0.00
15	Anaconda	30	23	33	66%	1.10	0m 46s	260	0.00
16	Pueblo	29	27	28	84.85%	0.97	0m 58s	202	0.00
17	San Antonio	27	27	16	57.14%	0.59	0m 10s	129	0.00
18	Washington	27	26	27	64.29%	1.00	0m 37s	233	0.00
19	Des Moines	26	26	15	55.56%	0.58	0m 03s	108	0.00
20	Fort Collins	26	23	24	51.06%	0.92	0m 53s	211	0.00
21	New York	26	24	8	27.59%	0.31	0m 07s	116	0.00

On Mar. 28, 2023, we held a “How to Use our New Maps” webinar for 147 participants. This webinar focused on how to use the new Broadband Mapping Hub and applications. During this webinar, attendees chatted praise and feedback including “GREAT job! The page looks really good!”

The Broadband Mapping Hub and related resources provide a foundational, transparent and accurate depiction of broadband coverage in Colorado that will support the CBO’s work into the coming years. It will also provide an account of state and federal investments through our grant programs and assist our grant staff in appropriately awarding and monitoring broadband projects in the future.

On the technical front, the applications were developed with the update workflow in mind so we can easily maintain them, push data updates, as well as improve upon them by adding new features and functionality. The data team is currently developing workflows and strategies for long-term maintenance and updates and is excited to work with our stakeholders to obtain more feedback. We are creating detailed documentation and following a training plan to ensure the team has the skills necessary to maintain and enhance the applications to meet future needs.

This priority project has transformed the daily work of the CBO data team. We’ve dedicated many hours to perfecting every aspect because the impact is so great on all stakeholders. We are dedicated to continuing to meet their needs and will adapt and improve the Hub as those needs evolve in the coming years. Ultimately, this project creates the foundation for the CBO to efficiently and effectively use state and federal funding to reach the Governor’s goal of connecting 99% of Colorado households by 2027.