

# Charting Colorado's Longitudinal Data Future



**2024**

**Prepared and submitted by the Colorado Department of Higher Education (CDHE)**

Report to the Education Committees of the Colorado House of Representatives  
and the Colorado Senate

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## Introduction

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Colorado continues to establish programs that support the success of all individuals, enact bold policies, and build a Colorado for all. To further advance those efforts, the well-governed, responsible use of data crossing various sectors over extended periods is necessary to elevate evidence-based decision-making. The collection, connection, and use of these longitudinal data supports the work to move these goals to reality.

Pursuant to HB22-1349, the Colorado Department of Higher Education (CDHE) is required to report on necessary steps and any barriers identified including recommendations for necessary legislative changes to deliver a statewide longitudinal data system in Colorado that connects K-12, postsecondary education and workforce information (CRS 23-1-141(7)). This report is the second of two reports that guide policymakers about Colorado's longitudinal data landscape and ways to support this work going forward.

In [last year's report](#), CDHE provided a detailed overview of Colorado's long history of efforts to support more connected, longitudinal data along with examples from other states and their efforts around longitudinal data. The report also provided national best practices related to state longitudinal data systems. Recent reports and efforts at agencies across the state have continued to elevate the importance of longitudinal data, specifically:

- The Secondary, Postsecondary and Work-Based Learning Integration ([HB22-1215](#)) Task Force convened by the Colorado Department of Education (CDE) recommended establishing and using a robust statewide longitudinal data system that should interface with data reported from the relevant entities that are shareable across agencies and comply with existing statutory parameters, including state and federal data privacy laws. The task force recommended that there should also be an associated investment in a public-facing dashboard with education and employment outcomes to help inform decisions made by learners and families.
- The 2023 Colorado [Talent Pipeline Report](#) published by the Colorado Workforce Development Council (CWDC) recommended establishing a longitudinal data system capable of following learners and earners throughout their education and training, providing valuable insight about practices to address the demand for and supply of talent in Colorado.
- CDHE is engaged in work related to longitudinal data via [HB22-1349](#). While the charge of HB22-1349 is not to create a new statewide longitudinal data system, it tasks stakeholders with modernizing various data systems and calculating new measures of postsecondary student success, which supports the contribution of detailed postsecondary data to a longitudinal data system. In doing so, CDHE and other state government staff can conduct better analyses on topics along the education, training and workforce continuum to make evidence-based decisions.

This year's report provides updates on CDHE's work over the past year, elevates specific use cases that can benefit from a more robust longitudinal data infrastructure and provides concrete actions Colorado can take to strengthen work around longitudinal data.

## Longitudinal data - Benefits, opportunities, and barriers

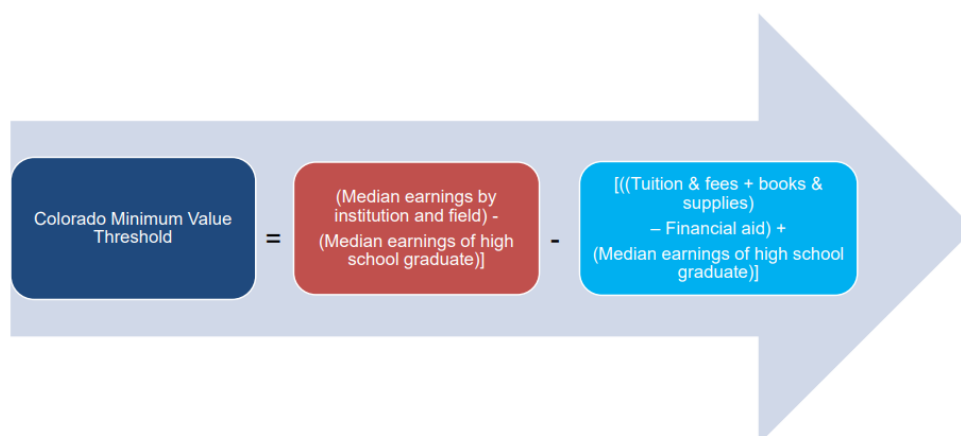
### Calculating value and return on investment for postsecondary education

Recent work to determine the return on investment for students investing in postsecondary education is one use case that benefits from a more robust longitudinal data infrastructure. The Colorado Commission on Higher Education's (CCHHE) updated [Strategic Plan](#) focuses squarely on the goal of increasing the number of Coloradans benefiting from valuable career skills that, at a minimum, enable additional lifetime earnings greater than the cost of postsecondary attendance. This plan includes measuring the value of career skills gained while in high school or via postsecondary education. As institutions and policymakers work to ensure that all pathways provide a return on investment, CCHHE and CDHE will simultaneously work to understand barriers and invest in proven practices that expand educational opportunities for all Colorado learners.

Pursuant to HB22-1349, CCHHE convened a Technical Working Group of state-level stakeholders and national experts to determine and define:

- Colorado-specific measures of postsecondary value, including a “minimum economic value threshold” focused on ensuring that Colorado learners, at a minimum, can count on their investment in postsecondary education enabling an increase in their lifetime earnings (over what they would have made had they not pursued postsecondary education) to exceed their cost of attendance (inclusive of the opportunity cost of foregone wages), and
- Student success measures that assess the progression of students through postsecondary education and the impact of postsecondary pathways on a student's career opportunities and success. The student success measures must include postsecondary success measures and workforce success measures.

The Technical Working Group met throughout 2023 to identify the best methods to calculate a minimum economic value threshold for postsecondary education programs in Colorado. The technical working group agreed on a framework that reflects incremental earnings minus the cost of attending higher education equaling the Colorado minimum value threshold. A more detailed equation can be seen below. This work builds on CDHE's annual [Return on Investment \(ROI\) report](#) and the measures published in that report. Measures such as time and credits needed to complete a credential along with cost and earnings information provide a foundation for calculations of value.



The technical working group spent a great deal of time discussing the data sources needed to calculate the Colorado minimum value threshold with fidelity. Various national experts, institutional representatives, and state agency staff discussed the ideal datasets and data elements necessary for this line of work. Centrally collecting and connecting individual-level data including pre- and post-secondary enrollment earnings, costs of higher education programs, and financial aid awards would be the best-case data scenario to calculate the minimum value threshold. Additionally, other non-financial measures of postsecondary success could be elevated to better understand the experiences of students as they navigate and complete postsecondary education. These measures would be disaggregated by gender, race/ethnicity, socioeconomic status, geography, etc.

However, given the current data infrastructure and landscape in Colorado, the working group was mindful that these data may not currently exist or be available for use as these data across a wide range of state, federal and administrative guidelines on their use. CDHE staff will continue to work with the technical working group to refine the Colorado minimum value threshold equation and identify the necessary and available data sources. This will support further conversations between institutions of higher education, policymakers and other stakeholders to better understand how postsecondary programs can provide individuals with valuable skills for lifetime success in the workforce.

While CCHE, CDHE, and the technical working group will continue this work, **better longitudinal data is necessary to truly understand the value of all types of postsecondary education to the individual, community, region, and state.** To accomplish CDHE's current ROI reporting requirements (CRS 23-1-135), a data sharing agreement between CDHE and the Colorado Department of Labor and Employment (CDLE) allows for the secure sharing of the necessary data. However, this is limited to very specific fields, and measures (such as earnings outcomes) are only calculated for individuals who complete a postsecondary program. Additionally, the cadence of postsecondary data collection is usually at the end of an academic term or year limiting its ability to inform decision making in a timely manner. Ideally, measures of student success, including Colorado's minimum value threshold, will include comparisons with individuals who did not engage in postsecondary education thereby showing a clearer picture of value/ROI for institutions, policymakers, and individuals in a timelier manner.

### **Defining Stackable Credential Pathways**

Another use case related to the value of postsecondary education involves the development of stackable pathways for students. These pathways enable students to complete education and training programs and "stack" those experiences into additional educational opportunities thereby building connections between programs and reducing the time it takes an individual to achieve higher education. In 2022, [SB 22-192](#) was passed to improve access to quality credentials of value in the workplace and create greater alignment between credentials and work-based learning. The law mandates that CDHE work with other government agencies and stakeholders from industry, K-12, and higher education to develop ten stackable credential pathways across five high-demand, high-growth industries by December 31, 2025. As outlined in a [report](#) on these pathways, **better longitudinal data are necessary to evaluate if stackable pathways are working to see the value of short-term credentials and how those credentials impact wages, further credential attainment, and workforce outcomes over time.** However, without a longitudinal data system, the data necessary to evaluate the effectiveness of programs remains siloed and inaccessible.

### **Improving access to basic needs supports**

Cross-agency data sharing facilitated by a longitudinal data system would also significantly improve Colorado's ability to use data to better understand the number of students struggling to meet their basic needs. Colleges and universities have the responsibility to promote student success beyond just the classroom by providing students with basic needs such as food, housing, and financial stability. Though schools want the best for their students, many schools can be met with financial or capacity barriers when trying to implement programs. CDHE continues to elevate the various [social determinants of student success](#) to ensure that the needs of students are met while still working within available resources.

CDHE is working with the Colorado Department of Human Services (CDHS) and RAND Corporation on a [study](#) funded by the U.S. Department of Education's Institute for Education Sciences (IES) to inform Colorado's efforts to increase college attainment by supporting students' needs for food and related human services. Researchers will conduct four studies to inform Colorado's decision-making:



- A quantitative description of current and historical rates of Supplemental Nutrition Assistance Program (SNAP) eligibility and participation among college students and variation in SNAP participation across institutions and student characteristics.
- A quantitative analysis of the relationships between SNAP participation and student academic outcomes, using quasi-experimental methods to compare academic outcomes for SNAP participants to SNAP-eligible non-participants.
- A quantitative simulation of how SNAP participation and student outcomes might change under four different approaches to expanding SNAP participation.
- A mixed methods description of how postsecondary institutions are implementing basic needs services to increase SNAP participation and an exploration of which practices are associated with high rates of SNAP take-up among eligible students.

Data necessary to accomplish this work will be contributed by CDHE and CDHS to the Linked Information Network of Colorado ([LINC](#)) and leverage its [processes](#) for data sharing for projects intended to conduct robust analyses and to inform policies. While LINC processes will allow this effort to accomplish its goals, **better longitudinal data is necessary to enable more coordinated outreach to postsecondary students who may be eligible for SNAP benefits.** For postsecondary students to enroll in SNAP benefits, a variety of criteria must be met. Various stakeholders (including CDHE, CDHS, institutions of higher education, and county human service offices) must coordinate with each other to ensure that data on the eligibility criteria for SNAP enrollment is available to make eligibility determinations.

Better data connections between Colorado state agencies via an improved longitudinal data infrastructure can support institutions and the state in serving students and ensuring their basic needs are met. Better access to public benefit programs can help address the various social determinants of student success and thereby support postsecondary student success.

## Recommendations

Colorado has an opportunity to leverage past work related to longitudinal data along with compelling use cases to create a robust statewide longitudinal data system that not only supports more evidence-based policymaking but also provides individuals with additional information to make decisions best for themselves, their families, and their communities.

CDHE's efforts in [last year's Longitudinal Data Landscape report](#) evaluated Colorado's current longitudinal data landscape using a [framework](#) developed by the U.S. Department of Education's Institute for Education Sciences (IES). This evaluation assessed the current landscape against categories such as:

- Purpose + Vision
- Project Planning + Management
- Stakeholder Engagement
- Data Governance
- System Design
- Data Use
- Sustainability

While the evaluation found that Colorado has made progress in creating well-governed, responsible data connections across state agency partners, a major weakness in Colorado's landscape currently is capacity and resources. **This evaluation found that the current landscape in Colorado is not sustainable without increased investment and clear commitment to this work.** The data landscape within the state cannot be conducive to enhancing a longitudinal data system over time without sustained human, organizational and material resources committed to the work. Additionally, a **better understanding of how various state-level initiatives work together, clear collaboration across agencies, and established data governance frameworks between these initiatives are keys to any future success.**

Last year's report also outlined how other states have accomplished this work. In the report, the work of Connecticut, Hawai'i, Kentucky and Virginia were showcased as exemplars. Each state navigated its own landscape and identified resources to ensure that the efforts to develop better longitudinal data had sustainable commitments from all stakeholders involved in the process. Each state has a different context, but sustained staffing and financial support over the years ranging from approximately \$3 million to \$17 million enabled these states to achieve success in developing these systems. [Additional research](#) by the National Skills Coalition (NSC) and Data Quality Campaign (DQC) provides more detailed breakdowns by state of upfront and ongoing costs associated with centralized and federated statewide longitudinal data systems. Their analysis found upfront costs for longitudinal data systems ranged from \$1.6 million to \$6.75 million. Ongoing (annual) costs for these systems ranged from \$200,000 to \$1.3 million.

In addition to the best practices showcased in these states, national partners have also provided a roadmap for states embarking on this work. The Data Quality Campaign has been a partner to many states in supporting the development of state longitudinal data systems and recommended actions to make these systems a reality. DQC recently released [recommendations](#) informed by state partners that provide policy and practice steps that states must take to make access to data possible from statewide

longitudinal data systems (with a specific focus on connecting data from early childhood through the workforce). These 10 recommendations include:

- Codify cross-agency data governance in state law.
- Establish an independent entity to administer the state's longitudinal data system.
- Map existing assets to identify system strengths and limits.
- Engage the public to prioritize data access needs and seek continual feedback.
- Fund state longitudinal data systems and the source systems that contribute data to them.
- Develop legal and privacy frameworks to enable and guide state data efforts.
- Develop and act on rollout plans when building data access.
- Invest in the talent and human capacity needed to modernize statewide longitudinal data systems toward access.
- Center privacy.
- Support local leaders in building their own capacity to use data.

In their report, DQC provides specific steps states can take on each of these topics along with examples of related actions other states have taken. They note that while these recommendations are essential, by themselves the recommendations are insufficient to ensure that individuals, the public, and policymakers have access to the data they need. **States must prioritize these enabling conditions with leadership from agency leaders, governors, legislatures, and other state leaders.**

Colorado has already implemented some of these recommendations. Efforts by CDHE and the Governor's Office of Information Technology (OIT) to map existing assets greatly enhance Colorado's ability to understand the strengths and limits of the work accomplished to date. Through various projects (some summarized in this report), state agencies have engaged stakeholders in identifying compelling use cases and data needs to support the success of policy priorities. Initiatives like the [Colorado Data Trust](#) (led by CWDC) and efforts of the Government Data Advisory Board ([GDAB](#); led by OIT) have developed legal and privacy frameworks to guide data efforts. **However, codification of longitudinal data efforts (via state law and/or an independent entity to administer the state's longitudinal data system) and sustained funding for systems have not made progress over the years and are areas of opportunity.** CDHE encourages the implementation of all these recommendations to bring the vision of a state longitudinal data system to reality.

Colorado continues to strive to better serve students by providing robust information about postsecondary options and finding ways to meet their basic needs. By building off previous efforts, identifying sustainable leadership and resources, and implementing best practices from other states and national partners, Colorado can develop a robust statewide longitudinal data system that supports shared goals of building a Colorado for all.