BETTER DATA FOR BETTER DECISIONS COALITION

BUILDING THE FUTURE

REALIZING THE VISION OF THE COLORADO LONGITUDINAL DATA SYSTEM

BETTER DATA FOR BETTER DECISIONS COALITION

CONTENTS

FOREWORD

Colorado currently stands at the precipice of a major opportunity—establishing the state as a national leader in using cross-sector data to expand students' access to and success in high-quality pathways from education to the workforce. With a commitment to the action steps outlined in this report, Colorado can use data across multiple sectors to shape a brighter future for its residents.

Colorado is already on a strong footing when it comes to data and metrics. Over the past decade, the state made significant strides in data collection and analysis and recently established a transparent and accountable system of governance that is sustainable across leadership transitions. With these efforts, there is a wealth of information available to inform decision-making and an explicit governance system to do so. **What's needed now is to leverage this existing work and create a cohesive, actionable approach to activate the true power of a longitudinal data system to support students across their full journeys to economic opportunity and mobility.**

As we look across our individual and collective experience over the past two decades, we suggest leaders in Colorado take to heart three suggestions as it works to implement HB24-1364:

- **Build on your current foundation:** Don't start from scratch. Leverage the great work already underway in Colorado to produce actionable information for stakeholders across the state.
- **Look to best practices:** Don't go it alone. There are many national frameworks that recommend best practices for data access and metric definitions. And there are a handful of states that have begun to walk a similar path. Use these resources to put Colorado on the leading edge.
- **Focus on early wins:** Don't let the perfect be the enemy of the good. By prioritizing quick, tangible improvements, the state can build momentum and demonstrate the value of the longitudinal data system.

We are excited that the Better Data for Better Decisions Coalition stands ready to support state agencies in achieving these goals. This coalition unites education and workforce organizations across Colorado to support a statewide longitudinal data system that empowers informed decision-making. Their collective expertise, alongside the strong foundation laid by Colorado's state education and workforce agencies and other state agencies, will be crucial in ensuring the success of this initiative.

The road forward may be rocky. Building a strong data infrastructure is the easy part; harnessing the will to provide robust access and use the system for decision making is the harder part. Colorado's governance structure sets the state up well, and still the coalition will be critical to ensure both happen on an appropriate timeline. It will be incumbent on the coalition to serve as both a cheerleader for progress and a monitor to ensure that work not only meets the immediate needs of stakeholders but also adapts to emerging challenges and opportunities.

The vision for a fully integrated, sophisticated data system is ambitious. **We are excited that the state is prioritizing the delivery of clear, actionable results in the short term, while also building a foundation for broader, more complex innovations over time.** We look forward to a time when the state can measure more sophisticated outcomes, such as economic mobility, and use that data to ensure that Colorado's education system is preparing all students for long-term success.

By embracing the report's recommendations, Colorado can realize the full potential of its longitudinal data system and set the stage for deeper, more sophisticated analyses in the future. This is a defining moment for the state to shape a brighter, more equitable future for all Coloradans. It's time to join hands and deliver on the promise of the Colorado Longitudinal Data System.

Ryan Reyna
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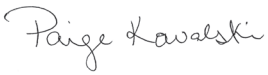

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INTRODUCTION

In 2021, the Colorado General Assembly created the Colorado Student Success & Workforce Revitalization Task Force (SB21-1330), which brought education, workforce, and business leaders from across the state together to make recommendations for improving Colorado's education and workforce development system. These leaders met over the course of six months and released a set of recommendations designed to help ensure that Colorado has a flexible and adaptive talent development system that is learner-centered and allows the state to invest in the most effective programming. These recommendations also set the stage for key legislation that continues to realize the vision of the task force, including:

- Creating the Opportunity Now Grant program (SB22-1350), which invests $90 million to support the creation and expansion of programs that prepare Coloradans for in-demand, high-wage jobs and careers.
- Convening a workgroup (HB22-1349) to advise on improving postsecondary student success data systems and define a new student success measure that includes outcomes and earnings.
- Working with industry to map postsecondary pathways in high-demand, high-wage fields (SB22-192) to make them easier to navigate for students and ensure industry-recognized credentials are included.
- Creating the Secondary, Postsecondary, and Work-Based Learning Integration (HB22-1215) Task Force to study how more high school students can access postsecondary credit, industry-recognized credentials, and high-quality work-based learning.

All four initiatives highlighted that Colorado's lack of a robust longitudinal data system caused significant challenges to realizing the full potential of their work. Specifically, the "1215" Task Force faced challenges accessing critical outcomes information necessary to measure program effectiveness due to the lack of streamlined data reporting. Lack of data was identified as a critical challenge for decision-making of learning providers, students, and families. One of the Task Force's recommendations is for Colorado to "invest in a truly unified state system that connects learner information from preschool through college and career and that captures the full array of publicly available data about education, training, work-based learning experience and skills development experiences, including nondegree credentials."

Though there were important data needs defined by all the initiatives, the Colorado General Assembly acted in response to the 1215 Task Force's recommendations as a starting point. In 2024, the legislature created the Colorado Longitudinal Data System (CLDS) and its governance structure through HB24-1364. The bill tasks the Office of Information Technology to create a comprehensive tool designed to follow and analyze students' education and workforce outcomes over time. This system would integrate data from education, workforce development, and economic development agencies, providing a centralized resource to evaluate the effectiveness of postsecondary and workforce readiness (PWR) programs. By linking long-term wage outcomes, education and training participation, credential attainment, and work-based learning program participation, the system aims to offer a clear picture of how investments in these programs translate into real-world success for students.

The Better Data for Better Decisions Coalition unites education and workforce organizations across Colorado to support a statewide longitudinal data system that empowers informed decision-making. The coalition was instrumental in championing HB24-1364, the culmination of work over many years centered on creating a system that reflects the needs of Colorado's students, educators, and employers, as it aims to enhance outcomes and opportunities for all. The coalition is committed to leveraging our shared expertise to advance a relevant, accurate, and user-centered system, ensuring it aligns with the goals and opportunities of K-12, postsecondary, and workforce sectors.

One of the most critical decisions that the CLDS Governing Board will make is operationalizing the use cases defined in the legislation to create 'early wins' that show the value of the data system, creating momentum for future development. The legislation clearly articulates that Colorado's first use case should involve reporting outcomes for high school students, including wage outcomes, to better understand the impact of PWR programming. This report provides a roadmap of how leaders across the Governing Board and CLDS workgroups might accomplish this, learning from the state's existing work as well as national frameworks and best practices.

OPPORTUNITIES FOR COLORADO

MEETING THE INTENT OF THE LEGISLATION—EXPLORING THE IMPACTS OF PWR ON THE EDUCATION-TO-WORKFORCE PIPELINE

The 1215 Task Force set a vision that by the time a learner turns 21, every Coloradan should have no-cost access to in-demand industry credential attainment, college credit that is part of a defined pathway, and high-quality work-based learning (WBL) opportunities. As the state moves towards realizing this vision, it is increasingly important to understand the impacts of Colorado's PWR programs. This understanding will allow Colorado to maximize state investments and help schools identify the programs that best serve students. Perhaps more importantly, it will allow Colorado to provide accessible and understandable information directly to Colorado learners, informing their education and training choices and career pathways. Colorado currently provides multiple PWR programs designed to expand Coloradans' access to and success in postsecondary education and training. State-funded programs include:

- Career and Technical Education (CTE)
- Early College High School
- Dual and Concurrent Enrollment
- Accelerating Students Through Concurrent Enrollment (ASCENT)
- Pathways in Technology Early College High Schools (P-TECH)
- Teacher Recruitment Education & Preparation (TREP)
- Career Development Incentive Program (CDIP)

As the 1215 Task Force report highlighted, the outcomes of Colorado's PWR programs are currently not collectively available because data are distributed across agencies, and some necessary data are not easily accessible. The Department of Education has worked with districts to collect better program participation data, particularly participation in WBL (see Work-based Learning in Colorado), and data collection is expected to continue to improve if participation in these programs is included in the state's performance framework. However, to fully understand the impacts of these programs on postsecondary enrollment and eventual workforce success, data from multiple offices must be combined. A deeper understanding of the success of these programs, individually and collectively, can be reached by analyzing the outcomes for students who participated in PWRs, including assessing if outcomes differ based on participation at varying levels and intensity and across different populations.

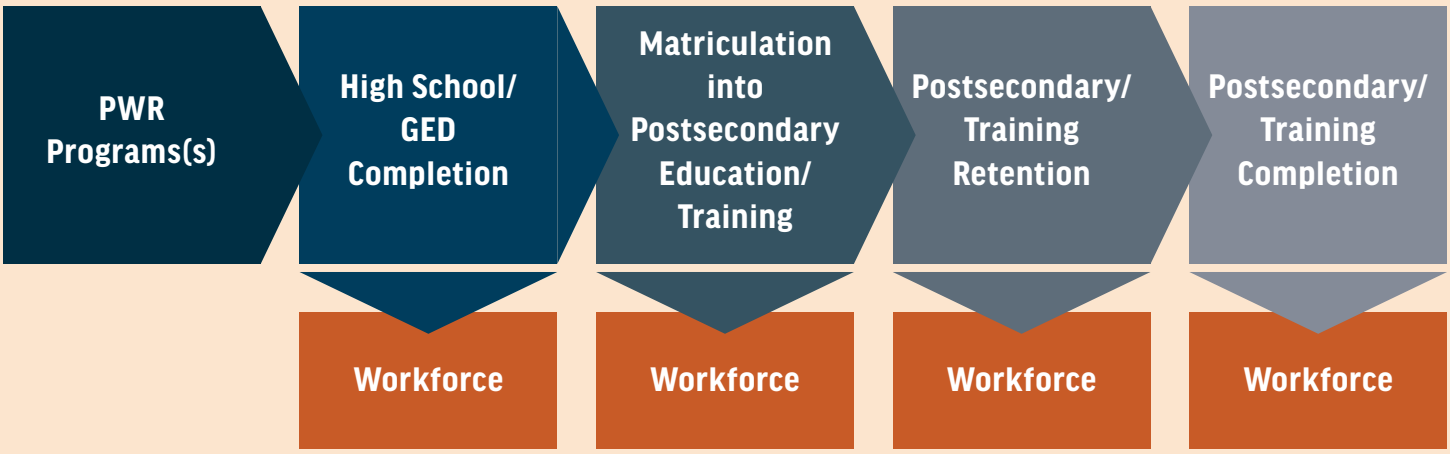
WORK-BASED LEARNING IN COLORADO

A growing body of evidence shows that participation in meaningful WBL experiences leads to better workforce outcomes. Colorado has made significant progress in both defining meaningful WBL experiences and expanding opportunities for WBL. Additionally, the Colorado Community College System recently began collecting data on WBL participation as part of CTE, but these data are not currently stored in a system required to report to the CLDS. As Colorado continues to focus on ensuring that all students have access to WBL, this is an area where the state will need to build data reporting capacity for high school students in the Colorado Department of Education's (CDE) data system and for postsecondary students in the Colorado Department of Higher Education's (CDHE) data system.

As illustrated in Figure 1, the impacts of each type of PWR are followed through the pipeline, with outcomes (e.g., high school completion, postsecondary matriculation and completion, and workforce/wages) tracked at each stage. Understanding this pipeline will help stakeholders better understand the impacts of different types and participation levels of PWR and the nuances of education and training (e.g., those who enter and leave postsecondary education at different times, including those defined as "Skill Builders" who attend postsecondary for specific training rather than a degree or certification).

FIGURE 1 Measuring Education-to-Workforce Outcomes

The following figure outlines the possible flow of an individual from high school to the workforce, with optional education and training along the path. Reporting of the pipeline should include, when appropriate, disaggregation by education provider, PWR program, and learner characteristics such as race/ethnicity, gender, disability status, and socioeconomic status.



Connecting previously disparate datasets through a longitudinal data system allows for a better understanding of the multiple pathways Coloradans take into the workforce, the impacts of various programs on these pathways, and the outcomes for Coloradans. Within each of these stages, we can better understand outcomes so individuals and policymakers can answer questions such as:

- Who is accessing PWR? Is access equitable? Are learners accessing multiple programs?
- What are the education and workforce outcomes of those who participate in PWR? Those who do not?
- What are the education and workforce outcomes of those who do not complete high school?
- What are the education and workforce outcomes of those who complete high school and enter the workforce directly?
- What are the education and workforce outcomes of those who complete short-term credentials (see Measuring the Outcomes of Short-term Credentials)?
- What are the education and workforce outcomes of those who complete some postsecondary education credits, but do not receive a credential?
- What are the education and workforce outcomes of those who complete postsecondary degrees (e.g., Associate, Bachelor, graduate, and professional degrees)?

MEASURING THE OUTCOMES OF SHORT-TERM CREDENTIALS

In addition to postsecondary education and training that results in a degree or certificate, Coloradans have opportunities to pursue short-term credentials as part of the education-to-workforce pipeline. These credentials can be:

- offered by high schools;
- offered by colleges and universities;
- offered and tracked through the Workforce Innovation and Opportunity Act (WIOA) and the state's Eligible Training Provider List (ETPL);
- offered by programs regulated by the Division of Private and Occupational Schools; or
- offered by other non-profit providers and exempt from state oversight.

While challenges currently exist in meeting the statutory requirements for inclusion of outcomes data on all of these providers (particularly those from "other providers," like private occupational schools), new efforts show that administrative wage data for short-term credentials is available, accessible, and verifiable. The Colorado Wage and Outcomes Results Coalition (WORC) partnered with a cohort of workforce development programs to leverage the Linked Information Network of Colorado (LINC) to conduct analyses that demonstrated how these data can be integrated. This project provides an example of how such data can be combined for analysis in the CLDS.

BUILDING ON EXISTING RESOURCES

Colorado has historically shared aggregate data on the education-to-workforce pipeline via a series of reports developed by various agencies, including CDE, CDHE, and the Colorado Department of Labor and Employment (CDLE), connected to aspects of the pipeline. Building the CLDS allows for the organization of all of these data in one place so reporting can occur in ways that show the flow through the entire pipeline rather than through a set of disparate reports relating to only one or more aspects.

Colorado's currently available reports and dashboards, presenting data related to education-to-workforce in the state (see Appendix A for a detailed description), provide a foundation of reporting metrics, but the reports, as currently organized, lack the streamlined PWR reporting structure recommended by the HB22-1215 Task Force. The fragmented data systems also create inefficiencies in the research process and gaps in the analysis. None of the reports link high school graduates directly to wage outcomes and none of them show education and workforce outcomes disaggregated by various PWR program participation.

TABLE 1 **Aggregate Data Currently Provided by Reports and Dashboards Relating to Colorado's Education-to-Workforce Ecosystem**

Report	HB24-1364 Required Metrics Currently Provided (in Aggregate)				
	PWR Enrollment*	Matriculation into Postsecondary	Postsecondary Retention	Postsecondary Completion	Wages
CDE District and School Dashboard		✔			
CTE Student and Teacher Data	✔	✔	✔		
CDHE Pathway to Affordability: Annual Report on Dual and Concurrent Enrollment in Colorado	✔	✔			
CDHE Pathways to Prosperity: Postsecondary Access and Success for Colorado's High School Graduates	✔	✔	✔		
CDHE Higher Education Return on Investment Report			✔	✔	✔
CDHE Postsecondary Degree Earnings Outcomes Tools				✔	✔
Colorado Post-Secondary Employment Outcomes Explorer (PSEO) data					✔

*Reports include aggregate participation data on some, but not all, PWR programs

Additional data reporting factors to consider as the CLDS is developed:

- **Same Data/More Information:** Individual agencies have access to local attributes that are currently unavailable in a centralized system, for example, the W2 data at CDLE includes industry information that often is not utilized and the Student Unit Record Data System (SURDS) housed at CDHE has detailed information about course-taking behavior. Making these available in the new CLDS will allow for enhanced reporting and analysis.
- **Increased Efficiency:** The collection of reports in Table 1 requires individual agencies to link data and perform similar analyses, creating duplication of effort and inefficiencies. Colorado has the opportunity to centralize cross-agency data sharing and reporting, freeing up individual agencies to strengthen their datasets, benefitting both the agency and future utility in the CLDS.
- **Usable Data Sets:** The Postsecondary Degree Earnings Outcomes Tools, listed in Table 1, are required to include downloadable datasets that can be utilized by stakeholders to analyze the data used to produce the dashboard. The creation of the CLDS and subsequent expansion of Colorado's data and reporting capabilities allows for increased provision of such datasets, a best practice in state data reporting.
- **State-Plan Alignment:** The Colorado PYs 2024-2027 WIOA State Plan and Colorado Perkins V State Plan outline priorities for the state that shape some of the current reporting highlighted in the table. The state's WIOA and Perkins plans should be aligned with the reporting recommendations required by HB24-1364.

LEARNING FROM BEST PRACTICES IN MEASURING K12, POSTSECONDARY, AND WORKFORCE OUTCOMES

As evidenced by the list of reports in Table 1, Colorado is measuring education-to-workforce outcomes in many ways that are helpful for decision-making. In fact, the state has received accolades for its education-to-workforce data ecosystem (e.g., Colorado's scores on Strada Education Foundation's State Opportunity Index (SOI) Clear Outcomes elements). **The creation of the CLDS will enhance these capabilities and allow relevant state agencies to collaborate in determining the best ways to combine data to measure and report the outcomes highlighted in the state's education-to-workforce pipeline (Figure 1), including an understanding of the impacts of specific PWRs on these outcomes.** This collaborative determination of measurement strategy should continue to be informed by national frameworks, such as Strada's SOI, the Education to Workforce Indicator Framework, and the Postsecondary Metrics Framework.

In its report, the Data Quality Campaign (DQC) presents ten best practices to support data access through improved State Longitudinal Data Systems (SLDSs). The directives of HB24-1364 will allow Colorado to execute eight of these best practices, including:

- codifying cross-agency data governance into law;
- establishing an independent entity to administer the state's SLDS;
- mapping existing assets to identify system strengths and limits;
- engaging the public to prioritize data access needs and seek continual feedback;
- funding SLDS and the source systems that contribute data to them;
- developing and acting on rollout plans when building data access; and,
- centering privacy.

DQC maps these practices, noting the importance of investing in the talent and human capacity needed to modernize SLDSs toward access and supporting local leaders in building their capacity to use data as necessary steps to building an SLDS that supports data access and use at all levels. Colorado has the opportunity to build an aligned system that empowers leaders at the local and state levels to engage with the data and leverage the insights for continuous improvement. Having the legislative runway to build an SLDS is only the first step. **A critical component is how these directives are implemented. For example, checking the box for codifying a data governing body is insufficient to create an aligned and impactful SLDS. The state needs to consider cross-agency leadership, decision-making power, required participation, and more to establish systems of transparency and accountability. DQC's report provides inspiration for ways the state can tackle the directives outlined in HB24-1364.**

DEFINING EDUCATION-TO-WORKFORCE MEASURES

National organizations and states, including Colorado, are considering the most useful ways to measure education-to-workforce outcomes. In determining the reporting process to meet the intent of HB24-1364, the CLDS team will identify the data points along the education-to-workforce pipeline that indicate outcomes. Some are relatively straightforward, like high school completion and postsecondary degree completion, and can be pulled from currently available datasets that will be part of the CLDS. Others, like 1-, 5-, and 10-year wages, have complicating factors, such as the necessity of obtaining data from outside the state of Colorado to understand the outcomes picture fully. While plans are underway to enhance aspects of available employment data (see Future Opportunities to Enhance Colorado's Education-to-Workforce Data), starting with the data that is readily available to be included in the CLDS is an important foundational step. Placing these data in context will be critical to effectively assess the impacts of Colorado's PWRs. The national frameworks listed above provide guidance for Colorado in identifying the measures the CLDS team will develop as part of the legislative reporting requirements.

Recommendations for Colorado

- Review the education-to-workforce pipeline and document the data necessary to follow individuals through the pipeline from PWR participation to the workforce at whichever stage they begin post-education employment (including re-entry into the pipeline).
- Identify the key outcomes that help stakeholders best understand the impacts of PWR participation and individuals' journeys through the pipeline. These should focus on elements listed in the statute and others that are informative and easily accessible, including:
  - participation in and completion of a PWR program(s);
  - high school/GED completion;
  - short-term/industry-recognized credential completion;
  - apprenticeship enrollment/completion (while not included in statute, data may be easily accessible);
  - postsecondary enrollment, retention, and degree or certificate completion;
  - employment; and,
  - 1-, 5-, and 10-year wages post-completion of each educational outcome.
- As outlined in the legislation reporting requirements, disaggregate these outcome measures by appropriate factors to determine equitable access to and flow through the education-to-workforce pipeline (see the Education-to-Workforce Framework Data Equity Principles for guidance). Colorado education-to-workforce reporting has traditionally included disaggregation, and the state is encouraged to continue this commitment and expand disaggregation where appropriate and meaningful.

LEARNING FROM BEST PRACTICES IN EDUCATION-TO-WORKFORCE DATA REPORTING APPROACHES

Despite its lack of an SLDS, Colorado has found methods to connect datasets in ways that allow state agencies to report some useful education-to-workforce metrics. Developing the CLDS will allow the state to build on this foundation and expand its ability to report on all aspects of the education-to-workforce pipeline. As previously noted, in April 2024, the Strada Education Foundation released its State Opportunity Index (SOI). For the Clear Outcomes section of the SOI, states were rated on ten elements foundational to successful data sharing to stakeholders. In Strada's state report for Colorado, the state received an overall rating of "Leading", the highest rating on the 4-level scale. For the elements directly related to the data reporting that is the focus of this report, Colorado received "Advanced" and "Leading" ratings. Despite these high ratings on elements identified by Strada as necessary for an effective education-to-workforce data ecosystem, Colorado is not yet able to effectively report on the impacts of its PWR programs. The development of the CLDS will give Colorado this opportunity. The recommendations outlined below include specific examples from states that have successfully integrated aspects of reporting that serve as examples for Colorado to consider.

Recommendations for Colorado

- As the state continues to respond to the recommendations of the various task forces, it should pay attention to how the recommendations complement one another. In particular, as it pursues program modernization that makes PWR programs more accessible, aligned, and recognized in state accountability measures, data quality and collection methods must continue to be strengthened within individual agencies so the CLDS can provide robust outcomes reporting and analysis.

- Review current reporting processes across agencies to determine areas for improvement, alignment, and efficiency. (See detailed list of reporting in Appendix A.) Reporting on PWR outcomes should include:

  - reports that explain the context and implications of the data;
  - dashboards that present data in ways useful to stakeholders; and,
  - data files available to researchers who can conduct analyses to enhance stakeholder's understanding of the data.

- Develop methods to merge these successful reporting processes into a centralized location via the CLDS and communicate the new reporting methods and locations to stakeholders who previously viewed the information in separate reports.

- Review examples from states that effectively report aspects of the education-to-workforce pipeline, with particular focus on evaluating the impacts of various types and levels of PWR. While few of the states listed in Table 2 include the entire education-to-workforce pipeline outcomes in their dashboards and reports, each has positive aspects that Colorado should consider including in its PWR reporting.

- Utilize CDHE's engagement in networks, such as the PSEO Coalition and SHEEO Communities of Practice, and other agencies' networks to engage with colleagues in states with streamlined SLDS reporting to better understand their methods while also sharing successful strategies employed by Colorado.

- Collectively develop a research agenda that will benefit all data-sharing agencies and stakeholders and include clear information on the application process to access these data to conduct analyses that complement this agenda. In addition to the national resource from the Data Quality Campaign, "What Now: A Vision to Transform State Data Systems to Inform People's Pathways through Education to the Workforce", pages 23-26, the following examples of state research agendas were developed primarily within SLDS governing bodies and provide good examples for Colorado to draw from.

  - Kentucky: KYSTATS 2023-25 Research Agenda
  - Maryland: MLDS Research Agenda
  - Nebraska: NSWERS Information & Research Agenda
  - Virginia: VLDS Research Agenda

- Continue to expand the provision of downloadable datasets for researcher access, as exemplified by the links included with CDHE's Higher Education Return on Investment Report and Postsecondary Degree Earnings Outcomes Tools.

TABLE 2 State Examples of Effective Education-to-Workforce Data Reporting

State	Characteristics of Note	Description & Opportunities for Colorado
Kentucky 	▶ Covers entire pipeline ▶ Includes downloadable data ▶ Disaggregated	Through KYSTATS, Kentucky has public downloadable data files and a public interactive reporting tool for both high school-to-employment outcomes and other life outcomes for high school graduates. These files and tools disaggregate data by race, ethnicity, family/household characteristics, income, and gender. In addition to student characteristic disaggregation, Kentucky data are filterable by PWR program (e.g., CTE, Dual Credit/Enrollment). Median salary data are then presented in comparison by post-high school outcomes. However, in order to see comparisons across PWR programs, the user needs to open multiple windows. Colorado could build on Kentucky's example as a method of comparing education and wage outcomes across the education-to-workforce pipeline.
Texas 	▶ Includes career schools ▶ Wage data in context ▶ Follows learners from 8th grade to postsecondary completion (wages to be added soon)	Texas has integrated and published several key types of postsecondary education, training, and employment data via the Texas Consumer Resource for Education and Workforce Statistics but has not yet integrated high school data into its reporting tools. Using the "Explore universities, colleges and career schools" option, Texas' tool provides data on enrollment, completion, and employment rate of postsecondary education providers, including career schools, but does not report comparison data in one table (possibly due to the sheer number of providers in the dataset). Through the "Explore majors and degree programs" option, the tool provides wage data in connection to tuition, completion time, and loan data. The Texas Higher Education Coordinating Board (THECB), as part of the state's Tri-Agency Workforce Initiative (with the Texas Education Agency and Texas Workforce Commission) evolved a previously static report into the Texas Talent Trajectory (T3), an interactive tool that follows learners from 8th grade through some of the outcome measures of interest to Colorado. Expansion of the tool to include wage data is in development. These tools provide ideas for Colorado as it expands its work to provide wage data in context (see Future Opportunities to Enhance Colorado's Education-to-Workforce Data). The first tool provides an example of the inclusion of career school data, necessary to effectively report the education-to-workforce data Colorado is striving to measure and report. The second tool provides an example of data reporting through the education-to-workforce pipeline that Colorado could expand on by adding PWR participation and wage outcomes.
Minnesota 	▶ Visual comparisons ▶ Clear design ▶ Filterable ▶ Disaggregated	Minnesota has public downloadable data files and a public interactive reporting tool for high school-to-employment outcomes, with disaggregation by race, ethnicity, and gender. Minnesota's dashboard allows the user to add multiple views to make side-by-side comparisons among filters, including school, region, graduation year, race/ethnicity, gender, and other criteria (including CTE participation). Minnesota also has extensive integration and publication of postsecondary education and training and employment data through the Minnesota Employment and Economic Development site. While a user needs to visit both dashboards to view outcomes of the entire education-to-workforce pipeline, the dashboards are somewhat consistent in design, making it easier for the user to review data across the two. Colorado could build on Minnesota's clear filter and multiple view options by connecting the entire education-to-workforce pipeline in one interactive dashboard.

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State	Characteristics of Note	Description & Opportunities for Colorado
Virginia 	▶ Visual guidance through the data ▶ Wage progression display ▶ Disaggregated ▶ Static reports	Virginia has extensive integration and publication of postsecondary education and training and employment data via the State Council of Higher Education for Virginia (SCHEV) Higher Ed Data site. While they do not include all the data points Colorado is planning to include in their PWR reporting, the interactive charts section of SCHEV's website provides an example of how to guide a user from left to right through a pipeline-type set of data to understand different aspects of the education-to-workforce journey. Publicly downloadable data and complementary interactive reports for public four-year, private four-year, and community colleges are also available through dashboards on the Virginia Office of Education Economics data page. These datasets are all disaggregated by race, ethnicity, family/household characteristics, income, and gender. This site also includes static reports which can offer Colorado inspiration as the state considers how they systemize and align required reporting. The Wage Progression tab of this dashboard provides an example of clear presentation of data over time that includes summative data in the final columns. This method could be helpful as Colorado develops methods for displaying multiple years of wage data disaggregated by various educational outcomes.
Illinois 	▶ Includes high school to workforce ▶ Provides comparisons	Illinois links and has a public interactive reporting tool for high school-to-employment outcomes, with disaggregation by race, ethnicity, income, and gender available by using the "Compare and Filter" function. Illinois's tool requires the user to answer questions that guide them to appropriate datasets and provides in-state earnings data 3-, 6-, and 9-years after high school. It also allows comparisons of earnings data for those with a high school diploma, postsecondary certificate, 2-year degree, and 4-year degree. The user question method may be more useful in a tool such as My Colorado Journey than in reporting, but Colorado can learn from Illinois' inclusion of high school directly to workforce data in its online resources.

Sources: SOI Clear Outcomes Element 3 summary, SOI Clear Outcomes Element 4 summary and the links included in the table

FUTURE OPPORTUNITIES TO ENHANCE COLORADO'S EDUCATION-TO-WORKFORCE DATA

As with any data reporting process, not all desired data are currently available for inclusion in analysis and reporting. Some future-focused opportunities for Colorado include:

- **Adding early childhood data into reporting.** The Office of Early Childhood is part of the CLDS; however, it is still developing its data system. Including early childhood in the data conversations is essential, and future reports should include early childhood in the education-to-workforce pipeline.
- **Addressing gaps for following students without access to social security numbers.** Potential exists for matching options employed by other states, such as Iowa partnering with its state Department of Motor Vehicles.
- **Enhancing unemployment insurance (UI) wage records (e.g., job title, pay rate, work location, worker type).** Strada Education Foundation, the U.S. Chamber of Commerce Jobs and Employment Data Exchange (JEDx), and the Postsecondary Employment Outcomes (PSEO) Coalition (of which CDHE is a member) are exploring methods states can use to expand the data currently collected and provided in UI records.
- **Establishing access to expanded workforce data via W2 records.** The U.S. Census is planning to add W2 data elements to the PSEO dataset (in which CDHE participates); LINC provided WORC (referenced earlier) access to W2 data via CDLE for their project, providing an example of the types of analysis that can be conducted with access to these data.
- **Placing wage data in context by reporting on minimum economic returns.** The CLDS can build on the work CDHE has begun by their development of a minimum value threshold calculation. (For national context, see Postsecondary Metrics Framework, page iv.)
- **Expanding workforce outcomes.** After the foundational workforce outcomes metrics of 1-, 5-, and 10-year wages are addressed for all aspects of the education-to-workforce pipeline, Colorado can continue to serve as a leader in the national emphasis on expanding wage outcomes to include measures of economic mobility and economic security (see pages 84-86 in the Education-to-Workforce Indicator Framework and the Postsecondary Value Commission Framework).

CONCLUSION

Colorado currently provides the public with multiple sources of information on education and workforce outcomes, but these information sources are spread across agencies, websites, and reports, making it difficult to understand the entirety of the education-to-workforce pipeline. **A well-designed SLDS can serve as a powerful tool to understand and improve how individuals engage with education and training to enter into and improve their experience with the workforce.**

The current process of developing the CLDS allows Colorado the opportunity to implement data-informed best practices demonstrated by state peers and national experts in order to collect and report education and workforce outcomes data. **Collaborative development of the CLDS requires an aligned state vision, the maximization of resources, and an understanding of Coloradans' engagement with the education-to-workforce continuum. The resulting collaboratively-built, best practice-informed CLDS makes Colorado nimble and adaptable to expanding data availability and identifying new outcomes of interest.**

Reporting education and workforce outcomes data using the recommendations outlined in this report will remove data silos, minimize duplication of efforts, and free up critical agency resources, allowing decision-makers to focus on other priorities based on the data insights, and giving them a better understanding of the impacts of the state's PWR programs. Reporting these data publicly via dashboards that allow user exploration, reports that provide context to the data, and downloadable datasets that allow researchers to engage with the data will allow Coloradans to better understand the outcomes of different types and levels of education and therefore make more informed decisions that directly impact their careers and lives.

APPENDIX A:
REPORTS/DASHBOARDS RELATING TO COLORADO'S EDUCATION-TO-WORKFORCE ECOSYSTEM

Report/Dashboard	Agency	Data	Disaggregation
CDE District and School Dashboard (Postsecondary Readiness tab)	CDE	▶ High school enrollment ▶ High school matriculation	▶ School ▶ Gender ▶ Race/ethnicity ▶ Disability status ▶ Socioeconomic status
CTE Student and Teacher Data	CTE	▶ CTE enrollment ▶ Postsecondary matriculation ▶ Postsecondary retention	▶ School district
Pathway to Affordability: Annual Report on Dual and Concurrent Enrollment in Colorado*	CDHE	▶ Dual and Concurrent Enrollment ▶ ASCENT enrollment ▶ CTE enrollment ▶ High school enrollment ▶ Postsecondary enrollment	▶ School ▶ Postsecondary institution ▶ Race/ethnicity ▶ Gender ▶ Socioeconomic status (for ASCENT)
Pathways to Prosperity: Postsecondary Access and Success for Colorado's High School Graduates**	CDHE	▶ Dual and Concurrent Enrollment ▶ CTE enrollment ▶ Postsecondary enrollment ▶ Postsecondary retention	▶ Race/ethnicity ▶ Gender ▶ Socioeconomic status ▶ Geography
Higher Education Return on Investment Report***	CDHE	▶ Postsecondary enrollment ▶ Postsecondary retention ▶ Postsecondary completion ▶ Wage outcomes	▶ Race/ethnicity ▶ Gender

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Report/Dashboard	Agency	Data	Disaggregation
Postsecondary Degree Earnings Outcomes Tools	CDHE	▶ Postsecondary completion ▶ Wage outcomes in-state	▶ Postsecondary institution ▶ Program of study ▶ Degree level ▶ Gender ▶ Race/ethnicity
Colorado Post-Secondary Employment Outcomes Explorer (PSEO) data	Federal	▶ Wage outcomes of postsecondary completers in- and out-of-state	▶ Postsecondary institution ▶ Program of study ▶ Degree level ▶ Employment industry ▶ Geographic region
Colorado Talent Pipeline Report	CWDC	▶ Wage outcomes	▶ Employment industry
Colorado PY22 WIOA Annual Report	CWDC	▶ Workforce and WIOA programs ▶ Skills gains	▶ Programs: adult, youth, dislocated worker, vocational rehabilitation, Wagner-Peyser, adult education
Colorado Labor Market Information Gateway	CDLE	▶ Employment statistics, industry and occupational projections	

* This report is no longer statutorily required.
** State statute gives districts the authority to request data included in this report at the student level, but most districts do not request these data.
*** CDHE has a statutory reporting allowance to include private occupational data in the ROI report, but this is not yet possible due to the lack of social security numbers needed to connect the data.

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