

Connections Matter

Identifying the Pieces of the Workforce Data Puzzle

What does it take to understand, invest in, and improve a state workforce? Data. High-quality workforce data is a powerful catalyst for economic success. It can provide the insights needed to shape state policy while empowering individuals to navigate their education and career pathways. But right now, the data is sitting in silos, and states are leaving opportunities for economic growth on the table.

Statewide longitudinal data systems (SLDSs) can provide the insights individuals need to navigate their education and career pathways with confidence and the information leaders need to meet state workforce goals. Robust SLDSs bring together individual-level data from across different sectors—early childhood, K–12, postsecondary, and the workforce—over time. When an SLDS links education and training program data to individual-level wage and employment data, it can enable state leaders and individuals to answer questions such as:

- Which career-focused training programs deliver the strongest return on investment (ROI) for students and job seekers?
- Which education pathways lead to high-quality careers?
- How do specific industry-recognized certifications affect a worker's long-term wage growth?
- How effectively do local talent pipelines generate a sufficient, sustained supply of skilled workers to meet regional hiring needs?
- What critical performance metrics best indicate the workforce success of state-funded education and training programs?



Workforce data—including both data about workers (e.g., employment, wages) within the state and information about the broader workforce landscape (e.g., high-demand fields, aligned training programs)—is an essential component of an effective state data ecosystem. By analyzing the direct relationship between specific education and training programs, industry-recognized certifications, and subsequent wage growth, policymakers can identify which training and career pathways are most effective at driving economic mobility and provide a high ROI for both the individual and the state. But for SLDSs to be capable of enabling these kinds of insights, they need to be powered by high-quality workforce data sources.

Current Data Ecosystem: From Silos to State Insight

The existing workforce data ecosystem is largely siloed, and many workforce data collection practices were designed to ensure compliance, not to support larger state goals. Because the existing system is limited, state leaders cannot currently answer many workforce questions. But states have opportunities to use the available data to inform policies and programs. Better understanding the current workforce data landscape is essential to achieving that goal. Four categories of workforce data are available to states:

State-Level Insights

The foundation of state-level workforce data typically rests on **unemployment insurance (UI) wage records**. States collect these records to manage the program that supports workers who have lost their jobs. Standard UI wage records include quarterly gross wages, industry codes, and identifiers like partial names and Social Security numbers. Enhanced wage records may also include Standard Occupational Classification (SOC) codes, employer location, and hours worked. Although not originally collected for this purpose, UI wage data makes better understanding employment outcomes and measuring the long-term effectiveness of job training programs possible for state and federal entities. While UI wage data takes about six months to be fully finalized, it remains the most complete source of wage and employment data at the state level.

Professional licensing data, typically managed by a state's Department of Consumer Affairs or independent regulatory boards, connects an individual's education credentials to their specific occupational practice (e.g., verifying that graduates in health care, teaching, or engineering have the appropriate

qualifications to practice their trade). Unlike broad wage records that may show only an industry category, licensing data includes precise details such as active license status, professional specialties, and practice addresses for regulated fields like nursing, accounting, and engineering. Integrating professional licensing data with wage and employment data could enable policymakers to assess whether graduates are successfully entering their trained fields, identify regional workforce needs in critical services, and inform strong public policy.

State Example

The Maryland Longitudinal Data System Center receives professional licensure data from the Department of Health that it can link with postsecondary data to understand if students graduating with health care degrees receive licensure in the field. For students and workers, this data ensures that career pathways are transparent and that state investments are effectively aligned with the actual demand for licensed professionals.

Enhanced Wage Records

Because UI wage data was not designed for the variety of purposes it now serves, the data has significant limitations, including that the data has time lags and that data on workers not covered by the UI program is not available. In response, three states (Alaska, Indiana, and Washington) are working to close some of these gaps by transitioning to enhanced wage records to provide more granular detail. These enhanced records include:

- Job title and occupation, which are often coded using SOC codes to understand exactly what roles are being filled;

- Hours worked, which allows for the calculation of hourly versus salary earnings to identify living-wage outcomes; and
- Work location, which involves collecting information on where the individual actually works, rather than where the employer is located, to better understand regional supply and demand opportunities.

Because UI wage data is the most comprehensive and readily available wage and employment data, leaders in other states should consider following this example and take the opportunity to expand and improve their workforce data ecosystem.

Education Program and Workforce Development Data

Postsecondary institutions and workforce training providers receiving federal funding are required to collect and report data on their **student populations and educational outcomes**. Programs that receive federal and state funding (e.g., Workforce Innovation and Opportunity Act [WIOA], Strengthening Career and Technical Education for the 21st Century Act) are also required to track detailed **participant demographics and characteristics**, such as veteran status, disability status, and prior educational attainment. In addition, these programs are required to collect **long-term performance metrics**, including postprogram employment rates at specified quarterly intervals, measurable skill gains during enrollment, and the successful attainment of recognized industry credentials. They often have to store this information in their own data system separate from traditional postsecondary enrollment and completion data.

National Insights

Because the labor market is not confined to state borders, states must often leverage federal partnerships to track students and their long-term outcomes. States can use the following systems to give state leaders additional insight and context for wage and employment data:

- **State Wage Interchange System (SWIS):** SWIS is a US Department of Labor database that facilitates the secure exchange of interstate wage data between participating states. It allows a state to “ping” another state’s UI records to verify if a program participant is employed elsewhere. While powerful for compliance, SWIS is strictly governed by federal law—its use is currently restricted primarily to performance reporting for programs authorized under WIOA. This restriction means it is often unavailable for broader research or general state-level policy analysis.
- **National Directory of New Hires (NDNH):** The NDNH is a federal database maintained by the Office of Child Support Services that compiles nationwide employment, quarterly wage, and UI records. It allows authorized entities to track worker mobility across state lines, offering a comprehensive look at multistate employment outcomes. However, the NDNH is generally unavailable to state-level policymakers and researchers for broad workforce evaluation or longitudinal studies.

- **US Bureau of Labor (BLS) Data Tools:** BLS Data Tools consist of a suite of public-facing web applications and databases that provide comprehensive regional and national labor market information. They allow state leaders, employers, and individuals to use aggregate data to analyze high-level trends, wage averages, and occupational projections across various industries.
- **Longitudinal Employer–Household Dynamics (LEHD):** A partnership between state agencies and the US Census Bureau, LEHD combines state-level UI wage data with federal census data to create a detailed map of worker flows, industry shifts, and earnings. LEHD allows states to view this information broken down by race, gender, age, and education level. However, it publishes only aggregate data, and because the system relies on the merging of massive datasets from different levels of government, the data is often subject to significant time lags (sometimes 12 to 24 months). Furthermore, while it provides deep demographic insights, LEHD does not always capture individuals’ specific skills or credentials.

Example: Post-Secondary Employment Outcomes

Post-Secondary Employment Outcomes (PSEO) uses LEHD data to track and calculate longitudinal earnings data for college graduates at milestones of one, five, and 10 years after graduation, and it follows these graduates across state lines and industry sectors. While expanding rapidly, PSEO also publishes only aggregate data. In addition, it currently focuses primarily on postsecondary graduates and may not fully capture individuals who exit the system with nondegree credentials or short-term workforce certifications. The participation of higher education institutions also varies by state.

Proprietary Sources

Proprietary data from vendors like Lightcast, Indeed.com, or LinkedIn can provide real-time snapshots of job postings and demand for specific skills. These tools are useful for tracking career pathways for individuals who move out of state and for identifying immediate skill shifts that other records may lag in reporting.



What Tracking Outcomes Really Takes

To transform workforce data into a catalyst for ROI and economic opportunity, states must intentionally build bridges between agencies that have historically operated in isolation.

Develop a Robust SLDS

A functional, integrated education and workforce data ecosystem requires states to do more than just collect records; it requires leaders to navigate complex legal and technical silos. States must bridge the divides among their source systems and bring the systems together with the shared goal of creating a robust data system that supports state priorities. While states can use individual data-sharing agreements between agencies, SLDSs with cross-sector data governance are far more effective and provide the longitudinal insights necessary to track long-term success. This governance model also allows for state leaders to develop shared data priorities and navigate legal and regulatory issues with a united approach.

Build Connectivity

Technical interoperability between historically siloed systems, which collect different kinds of identifying information, is critical to tracking longitudinal outcomes. States must invest in sophisticated crosswalk systems that align disparate coding structures, such as Classification of Instructional Programs (CIP) codes for education and SOC codes for occupations. Beyond simple alignment, states must ensure that they have effective, statistically sound ways of connecting that data in meaningful ways—ensuring, for instance, that a “nursing major” can be accurately tracked into a “health care industry” wage record to determine if training matches employment.

CIP and SOC codes

To map workforce pipelines, track economic trends, and measure whether higher education programs are successfully meeting regional employment demands, states rely on CIP codes to categorize **academic majors and training programs** and SOC codes to classify **specific occupations**. However, states face significant challenges because **crosswalking the two systems is notoriously complex**; a single degree can lead to dozens of distinct careers, and these rigid federal taxonomies often lag behind rapidly evolving, real-world job titles.

State Example

Washington’s Education Research & Data Center (ERDC) used a CIP–SOC crosswalk to align instructional programs—including apprenticeships—with occupational categories from the state’s enhanced UI wage record system. This alignment enables the ERDC to publicly display through the Earnings for Graduates Dashboard aggregate earnings of students who’ve completed education and training programs, broken down by institution, field of study, award level, and industry of employment.

Cultivate Analytical Capacity

Raw data is only as valuable as the insights derived from it. There is a critical need for analytical capacity and expertise at the state level. Building this capacity requires a sustained commitment to funding—both for hiring specialized personnel and for providing ongoing training to ensure that agency staff can translate complex datasets into actionable evidence. The best way to cultivate analytical capacity is by investing in a robust SLDS that can connect data across different sectors and both leverage and amplify the analytical power of the source systems as well.

State Example

The Kentucky Center for Statistics (KYSTATS) is the managing entity of Kentucky's SLDS and is governed by a cross-agency board composed of the heads of all of the state agencies that contribute data. This shared responsibility for decisionmaking about cross-agency data has enabled cross-sector insights like the [Postsecondary Feedback Report](#). This report uses UI wage and postsecondary data to show enrollment and employment outcomes, including median wages disaggregated by institution and major at three, five, and 10 years following graduation, for students who attended Kentucky postsecondary institutions. Cross-sector governance, backed by ongoing investments in analytic capacity, has created a data ecosystem that produces high-value insights that optimize state funding and track long-term economic outcomes.

Make Data Useful

The ultimate measure of a data system's success is whether people actually use it to improve lives. States must meet data users—from state policymakers to individuals and their families—where they are. Information must be accessible, intuitive, and designed to meet the communities' specific needs. Meeting this goal requires substantive [community engagement](#) and a shift toward user-centered design to transform dense reports into interactive dashboards that empower audiences to make informed choices about education, career pathways, and public investments.

State Example

California has prioritized community engagement since the inception of its SLDS, the California Cradle-to-Career Data System. This effort to build trust and seek feedback paid off in the development of tools like the [Student Pathways Data Story](#), which displays postsecondary pathways and translates them into employment and earnings in an easy-to-navigate format. Community feedback resulted in improvements to the tool, such as the addition of variables so users can disaggregate information, enhanced mobile functionality, and the launch of [query builder tool](#).

Workforce Pell

Workforce Pell extends federal financial aid eligibility to short-term, career-focused training programs lasting eight to 15 weeks that prepare students for high-demand occupations. By aligning education and workforce data, an SLDS can bridge silos so that leaders can better assess postcompletion employment, stackable credential progress, and program performance and continuously align successful workforce offerings with real-time labor market demand.



Barriers to Success

Several barriers to using workforce data to better support people and policymaking persist:

- **Data Matching:** Because UI wage records often lack the granular identifiers necessary to precisely match individuals in education and workforce datasets, states are frequently forced to rely on “likely matches” or probabilistic methods for data matching across sectors. To solve this issue, some states are leveraging alternative datasets, such as Department of Motor Vehicles information, to ensure that the longitudinal insights produced by their data systems are reliable, high quality, and ultimately useful for decisionmaking. Driver’s license data can be used to fill gaps in other records, empowering leaders, decisionmakers, and individuals to make informed choices that meet their needs.
- **Omitted Individuals:** Many individuals—including active military personnel, independent contractors, self-employed individuals, and “gig economy” workers (e.g., rideshare and delivery drivers)—are largely invisible in traditional UI wage data because they do not qualify for the program. This omission prevents state leaders from fully understanding wage and employment outcomes, which is critical when designing programs to meet employer and individual needs. To further close information gaps, states can consider leveraging state income tax data, which can help them compile more complete information about individuals’ employment and fill in gaps left by other source data.
- **Data Lag:** UI wage data and income tax data lag six to 12 months behind the actual labor market. This delay prevents state agencies from implementing the rapid-response economic planning required to meet immediate workforce needs as circumstances change within their state. Policymakers and program leaders must have access to timely, current information to align training programs with existing demand and support workers in real time. Shortening this lag can transform static historical reporting into more proactive tools for economic mobility.
- **Privacy:** Protecting individual privacy is paramount when working with individual-level data. Navigating the complex regulatory landscape, including the Family Educational Rights and Privacy Act and federal UI confidentiality laws, can present a significant hurdle for state leaders. However, states across the country are proving that protecting privacy and producing robust, actionable outcomes data are not mutually exclusive goals. With strong cross-agency data governance and secure policy guardrails, states can successfully unlock the value of integrated data while ensuring that individuals’ data is secure.

Connected Workforce Data. Clearer Paths.

Today's Reality

Individuals often make education and career decisions with incomplete information. Important data exists, but it's spread across disconnected systems, making it difficult to compare options or understand likely outcomes.

Randall
Veteran / Reskiller
How do I turn my experience into a civilian career?

Explore
Discover opportunities that align with interests, experience, and local workforce needs.

Learn
Compare education and training options, then build the skills people need to move forward.

When that data is connected, individuals gain clearer information about pathways through education and employment, and policymakers gain the evidence to strengthen the workforce for everyone.

Complete
Earn credentials, licenses, or degrees that open doors to employment.

Succeed
Move confidently into the workforce with better visibility into future opportunities.

DQC
Data Quality Campaign

Raj
Early Worker
What's my next step—and what will it take to get there?

Grace
College Student
Which path gives me the best opportunity after graduation?

MANY POSSIBLE DIRECTIONS

INFORMATION CLARIFIES OPTIONS

SKILLS BECOME CREDENTIALS

VERIFIED SKILLS
Credentials connect education to real workforce opportunities.

CAREERS THAT FIT

COMPARE PROGRAMS
See how people on similar paths fare after they graduate.

CAREER EXPLORER
Compare local careers, wages, and education pathways.

OUTCOMES INFORM THE FUTURE
Workforce outcomes data helps improve pathways for the next generation.

The Foundation

The Complex Data Ecosystem

Workforce data exists but lives in disconnected systems. No single source shows the whole picture. But, when brought together, this data can help leaders support meaningful workforce pathways.

State-Level Insights
National Insights
Education Program and Workforce Development Data
Proprietary Sources

Connect

Connect data through an SLDS.

UI Wage Records
Labor Market Information
Postsecondary Enrollment and Completion Data
Professional Licensing Data

Understand

With connected data, leaders can:

Anticipate Needs



Identify workforce shortages before they become critical.

Guide Investments



Prioritize programs that lead to strong career outcomes.

Measure Impact



Evaluate the return on education and workforce investments.

Improve

Enable better decisions.

What's at Stake

Connected data helps leaders identify what works, invest more effectively, and strengthen pathways for every learner and worker.





Recommendations: Strategic Value of an SLDS

The true power of an SLDS lies in its ability to connect otherwise siloed data to answer questions that a single agency cannot. By linking education data to workforce data, state leaders are able to assess wage outcomes, identify and implement policies that support state workforce goals, and assess the ROI of education and workforce training policies and programs for both the individual and the state. To transform workforce data into a tool for economic opportunity, state leaders should:

- **Connect Siloed Data:** Combining workforce and education data allows leaders to evaluate education and career pathway outcomes and use a data-driven approach to state investments. Successfully developing these comprehensive systems requires identifying clear use cases and establishing cross-agency consensus by providing service and tangible value back to the contributing data providers, demonstrating how a more connected ecosystem can support agency capacity and produce better policy outcomes.
- **Enhance and Expand Wage Record Data:** Expanding UI wage data by securely incorporating more information about workers can equip state leaders with a fuller picture of their workforce. By ensuring that SLDSs include the most robust workforce data available, leaders will be able to gather and act on insights to improve their education-to-workforce pipelines, grow their economies, and support workers in securing high-quality careers.
- **Strengthen Governance:** Cross-agency data governance codified in law helps ensure that education and workforce data brought together in an SLDS can be responsibly linked and used to inform decisions that support student achievement and successful transitions into careers. Best practice governance legislation establishes the governing board's structure, membership, processes, and charge.
- **Invest in Capacity:** SLDSs can hold the key to understanding what works in education, workforce development, and beyond, but only if states have the capacity to analyze and use the data. State leaders should ensure that funding is ongoing and dedicated for both source data systems and the analytical talent states need to make data useful.
- **Empower Researchers:** Empowering independent researchers with access to secure SLDS data can help drive policy improvements by enabling experts to provide trusted insights that help individuals, the public, and policymakers understand education and workforce transitions and outcomes.
- **Create Public Tools:** Even robust data is only as valuable as it is accessible. Community engagement with the intended data audience is essential as states develop effective public data tools. States should invest in intuitive tools that translate complex metrics into clear, actionable insights. By demystifying information, states can empower students and workers to make highly informed, data-driven education and career choices.

Broaden Source Data Captured by SLDSs

States can further enhance their SLDS by integrating data sources beyond education and employment metrics—such as Supplemental Nutrition Assistance Program (SNAP), Medicaid, Temporary Assistance for Needy Families (TANF), and early childhood program records. This data can help state leaders better evaluate the economic impact of state priorities and policies. With broader source data, leaders can answer questions about how investments in the workforce affect the number of residents using programs like SNAP and Medicaid or how increased participation in education and training programs affects state tax revenues.



Conclusion

Building a robust, integrated workforce data ecosystem is a substantial undertaking that requires sustained commitment, cross-agency collaboration, and dedicated investment. The technical and cultural challenges of connecting siloed systems—and aligning policy to ensure privacy and security—are significant. But this effort is fundamentally worth the investment. When states successfully bridge the data gaps among disconnected systems, they unlock the longitudinal insights necessary to understand what works, drive economic mobility, and ensure that every individual has a clear pathway to success. States across the country are proving that this work is possible and that by prioritizing this work leaders can transform robust workforce data into a powerful engine for opportunity.