

State of Arkansas

Application for Workforce Data Quality Initiative – WDQI Round 8

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## **Statement of Need**

Although the minimum requirements for WIOA reporting are currently met, current systems lack the level of data and programming to produce enhanced products beyond the minimum that is required. Arkansas has established a longitudinal administrative database (LP2), the state must expand its current capacity to further the vision of WIOA and to more effectively analyze the impact of certifications, work experience, education, training programs, and federal workforce programs.

The current SLDS is primarily beneficial for reporting on education outcomes of high-skill jobs requiring postsecondary credentials. It does not provide coverage on WIOA programs, career pathways, apprenticeships, wraparound services and other data and deliverables needed to measure and improve services, remove barriers, and provide employment and training services to low-skill and middle-skill occupations. It also does not have the timeliness required for continuous program improvement and alignment, which was underscored by the dynamic nature of 2020 and has been identified as a priority for the SLDS by the Arkansas legislature (A.C.A. § 25-4-127). Arkansas education, employment, and training services also have the potential for a large increase in participation due to a new requirement for mandatory participation in SNAP employment and training services and a new incentive for work, education, or training under the Arkansas Medicaid expansion.

Lacking the ability to produce enhanced analytics that better support evaluations and strategic planning, the state will struggle to meet the needs of our state agencies to better evaluate their service delivery as well as the needs of Arkansans to fully understand the value of those services.

## **Current Status of the State's SLDS**

The State of Arkansas established its first Statewide Longitudinal Data System (SLDS) in 2008 as a partnership between the Arkansas Department of Education and an Arkansas university research center. This system has seen several expansions with the assistance of prior Statewide Longitudinal Data System and Workforce Data Quality Initiative funding opportunities, and the state has received many benefits from linking administrative records from K-12, postsecondary education, employment, and earnings. Research and data products produced from the SLDS are used to inform citizen decisions, support evidence-based policy, and evaluate the performance of education programs.

Arkansas Act 936 of 2019 moved the responsibility for the SLDS under the Arkansas Chief Data Officer and Data and Transparency Panel and expanded the vision of the SLDS to:

- Help the leaders of this state and service providers develop an improved understanding of individual outcomes resulting from education and workforce pipelines in Arkansas
- Identify opportunities for improvement by using real-time information
- Continuously align programs and resources to the evolving economy of this state

Modeling the general structure of the database established with the WDQI funds received in Round 5, the state moved the SLDS database in 2019 within the Arkansas Department of Transformation and Shared Services (TSS) Division of Information Systems (DIS). This effort was made under the direction and governance of the Chief Data Officer (CDO) and the Data and Transparency Panel (DTP). The DTP is a governance body established by Act 912 of 2017, with representation from the director or designee of each executive agency and appointees from the House, Senate, and Governor's Office.

Per the direction set by Arkansas executive agencies, the legislature, and the Governor's Office, the state seeks to incorporate more data and programs into the SLDS and using a centralized service model for maintaining the infrastructure required for a longitudinal database that serves the needs of multiple state agencies and partners.

A central service model establishes a standardized approach for data governance, providing all suppliers of data assurance needed to share their respective data. Adopting a cost recovery model to replace the current contract-based funding model also positions the state to support the database beyond the 3-year period. This centralized service model would also support MOU and DSA drafting for agencies that provide data, streamlining that process through standardization. Under the Arkansas "Ready for Life" initiative, the state is currently expanding the SLDS with additional longitudinal education and workforce data and products from pre-K through career to support more granular, mature, and actionable support for evidence-based policy, strategy, and citizen-facing data products.

### **Sustainability Plan**

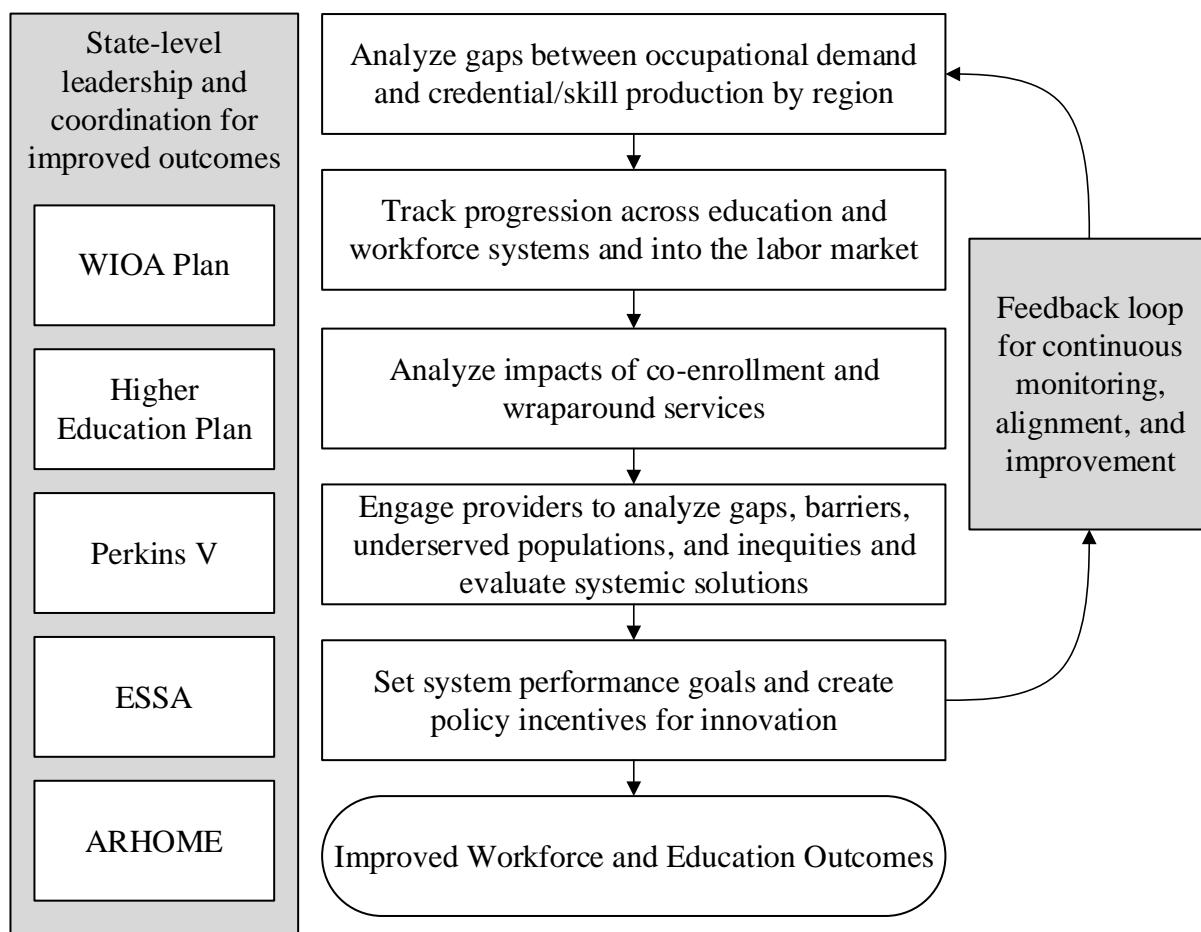
The Arkansas Legislative Council Data-Sharing and Data-Driven Decision-Making Special Subcommittee recognized the importance of developing and supporting the Statewide Longitudinal Data System to expand data driven tools to help Arkansans develop key workforce skills and connect to employment opportunities. In 2021, additional appropriation was approved to support this type of state enterprise initiative. The proposal will be implemented using state shared services and cost recovery via 2 CFR 200-compliant cost allocation mechanisms and are cost effective to support after initial design and development due to statewide economies of scale. This combination provides a stable foundation for sustainability beyond the initial grant period of any expansions or enhancements made possible by this funding opportunity.

## Expected Outcomes and Outputs

### Objectives

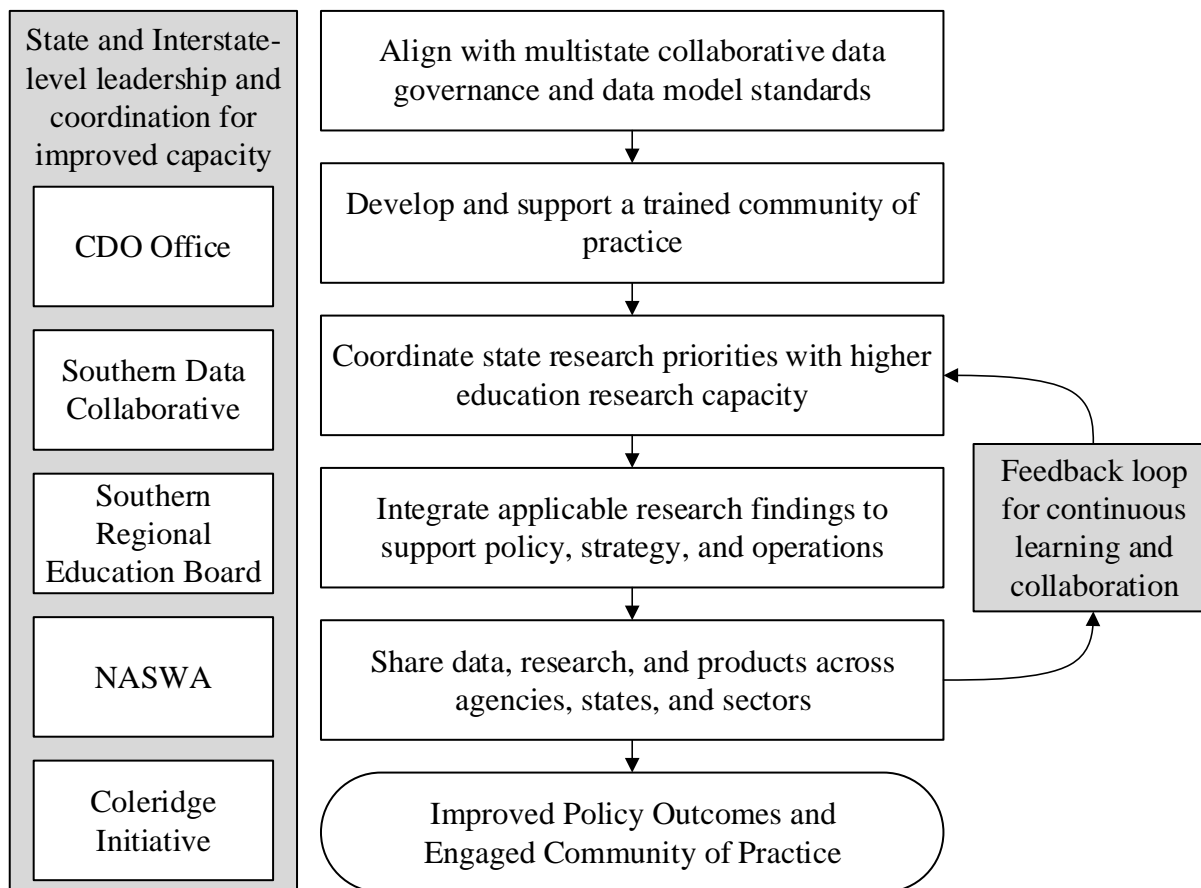
Arkansas objectives for expanding and enhancing the longitudinal data system are centered around the needs of two complementary strategies for promoting continuous learning and improvement in workforce and education. The first strategy is to help the state leaders and service providers continuously improve programs and services and align resources to the evolving needs of citizens to deliver better workforce and education outcomes.

### Strategy for Promoting Continuous Improvement in Workforce and Education



The second strategy is to facilitate continuous learning and collaboration through shared standards and governance, analytic capacity building, coordinated research and data products, and interagency, interstate, and cross-sector collaboration to support improved policy outcomes and an engaged community of practice.

### Strategy for Promoting Continuous Learning in Workforce and Education



Both strategies are heavily reliant upon the availability of:

- A comprehensive database of high-quality, timely, linked administrative longitudinal data
- Training for analyzing data and applying insights for improved performance and policy
- Mechanisms for providing secure, governed, tiered data access and data products to a wide range of state workforce, research, and public users

Arkansas objectives for the major activities supported by this funding opportunity include:

- **Expanding the workforce longitudinal database** – The state seeks to expand the scope of the SLDS to support application of the above strategies to WIOA Title I, II, III, and IV programs, Registered Apprenticeship Programs, Supplemental Nutrition Assistance Program (SNAP), and Temporary Assistance for Needy Families (TANF).
- **Improving the quality of workforce data** – The state seeks to improve the quality of workforce data by maturing from a legacy repository data warehouse approach to a modern data hub approach that extends SLDS analytical capabilities with best practice data governance and data quality management capabilities including metadata management (data dictionaries), data quality management, and master data management.
- **Expanding capacity to match workforce and education data** – The state seeks to expand its capacity for administrative data linkage by leveraging advanced probabilistic identity resolution across a broader population and adding support for household linkage.
- **Using data for analysis of workforce and education programs** – The state seeks to develop a statewide skills gap analysis to support program improvement and alignment as well as products to support analysis of co-enrollment, equity, program cost effectiveness, credential attainment, skills gains, career pathways, work history, and apprenticeships.
- **Producing and disseminating workforce training provider performance information and outcomes** – The state seeks to disseminate workforce training provider performance information and outcomes via provider performance dashboards.
- **Creating user-friendly portals to inform consumer choice** – The state seeks to support user-friendly options for informing consumer choice by adding products to the state open data portal and the learning management system informed by user-centered design.



## **Outcomes**

The measurable outcomes expected to result from the project include:

- Increase the employment outcome reporting frequency from annual to quarterly (300%)
- Increase the annual completers covered by the skills gap analysis by 250%
- Increase Arkansas labor force coverage in the SLDS
- Increase coverage of credential attainment in the SLDS
- Provide applied data analytics training on integrated workforce data to 60 participants.
- Increase the number of consumer-facing workforce outcome products from 1 to 6 (500%)

## **Outputs**

The tangible product and service deliverables that will result from the project:

- A consumer-facing product for informing program choices based on costs and outcomes
- A consumer-facing workforce asset map for easy identification of workforce resources
- A statewide skills gap analysis to support program improvement and alignment
- A product for analyzing co-enrollment and outcomes and to inform policy and strategy
- A product for identifying underserved populations to support equity and outreach
- A product for informing resource strategy and allocation based on costs and outcomes
- A product for analyzing skills gains and outcomes for credentials and career pathways
- A product for analyzing registered apprenticeship outcomes
- A product for analyzing the impact of work history on program outcomes
- A product for analyzing frequency and outcomes of common intake referral patterns between SNAP, TANF, WIOA, and career pathways

## **Project Design**

### **Timeline**

The quarterly timeline for completion of project work is:

- Quarter 1 – Project initiation, detailed planning and design, Asset mapping
- Quarter 2 – WIOA data integration, Apprenticeship data integration
- Quarter 3 – WIOA data integration continued, WIOA costs and outcomes analysis
- Quarter 4 – SNAP data integration, WIOA resource allocation analysis
- Quarter 5 – TANF data integration, SNAP/WIOA policy analysis
- Quarter 6 – FEDES data integration (if available), Underserved communities analysis
- Quarter 7 – Applied data analytics program, Work history outcomes analysis
- Quarter 8 – Workforce research conference, Skills gap analysis, Skills gains analysis
- Quarter 9 – Applied data analytics program, Apprenticeship analysis
- Quarter 10 - Co-enrollment outcomes analysis, Common intake referrals analysis
- Quarter 11 – Applied data analytics program
- Quarter 12 – Workforce research conference, Final documentation and reporting

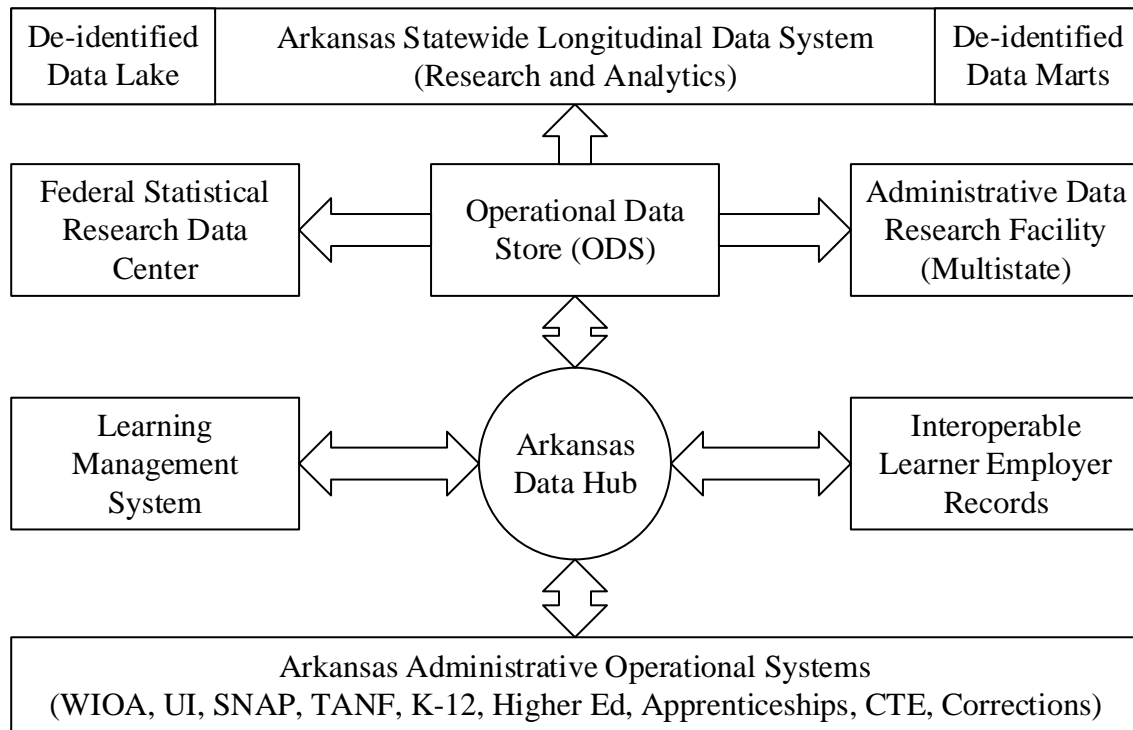
Project work will be performed in quarterly development sprints with planning preceding data integration preceding related analysis and data product.

Applied data analytics programs will be held in quarters 7, 9, and 11 to build analytic capacity and community of practice through collaborative work on projects related to current research.

These quarter-long programs will consist of 20-25 interagency and interstate participants.

Annual workforce research conferences will be held starting in quarter 8 to bring together higher education researchers and workforce development stakeholders to present workforce research and discuss implications, potential applications, future needs, and next steps.

## Database Design



The statewide longitudinal database design includes and leverages the following components:

- Arkansas Data Hub** – Centralized, shared-service platform for secure, governed interagency data sharing, integration, orchestration, and use. The rationale for this approach are detailed in the final report of an 18-month [statewide data warehouse study](#).
- Operational Data Store** – Data from Arkansas administrative systems are loaded via the Data Hub into a secure operational data store (ODS) prior to being loaded to the SLDS. This layer stores timely, individual level identified data in interoperable, standard formats to facilitate authorized operational needs such as common intake referrals.
- SLDS Data Lake** – Deidentified individual-level data from the ODS are stored in an SLDS data lake for repeatable research and analytics on raw data in standard formats.
- SLDS Data Marts** – Deidentified subject-oriented dimensional data marts are loaded with transformed data from the ODS to support easy, performant self-service analysis.

## **Data Quality Assurance**

Support for data quality assurance is provided by mature self-service tools in the Data Hub for profiling and monitoring of operational data quality via data quality dashboards. Enterprise Master Data Management provides support for identifying, resolving, and avoiding data quality issues with share master data such as persons, households, organizations, programs, and locations. Enterprise Reference Data Management provides access to a share set of reference values for shared attributes such as county or gender for improved representational consistency. Several members of the SLDS team hold graduate degrees in information quality.

## **Proposed Uses**

The proposed uses of the SLDS include:

- Informing consumer decisions and supporting transparency
- Supporting program alignment, improvement, outreach, and resource allocation
- Supporting research for evidence-based policy and state priorities
- Supporting multistate integration and research through the [ADRF](#)
- Integration of data from and supply of LMI data to the [Learning Management System](#)

## **Potential Risks, Barriers, Mitigations**

Sustained data sharing is a risk factor, but the state has a mature data sharing culture and a standardized statewide data sharing agreement. Resource availability and turnover are risk factors that are mitigated by using a shared pool of expert resources with documentation and knowledge transfer. Potential privacy and security concerns are mitigated through governance and oversight by the Chief Privacy Officer and Chief Information Security Officer. Synergies with Ready for Life, ARHOME, and other priority state efforts help ensure continued support.

## Scope of Longitudinal Workforce Data

Programs that are included in the SLDS database:

- Post-secondary ([CEDS Layout](#))
- K-12 ([CEDS Layout](#))
- Quarterly UI wage-record information ([QCEW/QUEST Layout](#))
- Weekly UI benefit information ([LAUS Layout](#))
- Career and Technical Education ([CEDS Layout](#))
- Career Pathways ([CEDS Layout](#))
- Federal Statistical Data (OES, LEHD, LAUS, QCEW, ACS, ONET)

Programs that will be included in the SLDS database under WDQI:

- WIOA Title I programs ([PIRL Layout](#))
- Adult Education and Family Literacy (AEFL) program ([PIRL Layout](#))
- Vocational Rehabilitation (VR) program ([PIRL Layout](#))
- Employment Service program ([PIRL Layout](#))
- Trade Adjustment Assistance (TAA) and Trade Readjustment Allowances ([PIRL Layout](#))
- Jobs for Veteran' State Grants (JVSG) ([PIRL Layout](#))
- Registered Apprenticeship Program ([RAPIDS Layout](#))
- Temporary Assistance for Needy Families ([Chapin Hall FSSDC TANF Data Model](#))
- Supplemental Nutrition Assistance Program ([USDA Gold Standard Layout](#))
- Federal employment data ([FEDES Layouts](#)) when reestablished (temporarily suspended)

Additional sources including occupational licensing, corrections, the state learning management system (LMS), interoperable learner employer records (LERs) will be added by September 2022 as part of the GEER-funded Ready for Life initiative.

## **Personal Identifiers**

Statewide universal identifiers are assigned in the state Master Data Management system, which provides robust, probabilistic identity resolution across identified administrative records from all participating systems. This centralized approach improves the accuracy and consistency of matching across all systems and reduces risk from sharing PII. Linked “golden records” for each individual, organization, and household are assigned surrogate identifiers and deidentified for longitudinal analysis. Deidentified record linkage across states is facilitated through the use of a [hash-based Message Authentication Code](#) algorithm provided by the Coleridge Initiative.

## **Partnership with the State Education Agency**

The state workforce agency has a mutually beneficial partnership with the state education agency that is needed for both education and workforce state plans. Integrated education and workforce data is a key component of the Governor’s Ready for Life initiative, and there is broad support for integrating education and workforce data from state agencies, the legislature, and the Governor’s Office. An existing SLDS data sharing agreement exists between the state workforce and education agencies, and a statewide data sharing agreement is currently being signed.

## **Other Inter- and Intra-state Agency Partnership**

A key additional partnership is with the state human services agency, which enables the linkage of SNAP data, benefitting both agencies and supporting SNAP E&T requirements and Medicaid expansion incentives. Arkansas is also in the process of completing a data sharing agreement with the Coleridge Initiative for multistate data sharing via the [Administrative Data Research Facility](#) (ADRF), and has partnered with Kentucky, Tennessee, Texas to form the Southern Data Collaborative with support from the National Association of State Workforce Agencies (NASWA).

## **State-based Wage Data Matching Systems**

Current state-based wage data matching systems are based on a deterministic match of Social Security Number (SSN) between the quarterly UI wage file and cohorts of postsecondary completers and other program participants. An annual report of employment and wages outcomes is published via a static report. Other state administrative data are linked via more mature probabilistic identity resolution across additional attributes and data sources to improve match accuracy and completeness, and this project will apply the same approach for wage data matching and expand outcomes reporting to all WIOA performance indicators and measures. While all minimum performance accountability reporting requirements under WIOA are currently met under state workforce agency operational processes, this project would leverage the SLDS to expand beyond the minimum requirements and provide data and analytic capacity to analyze outcomes and contributing factors more thoroughly for performance improvement.

## **Confidentiality**

The security of data will be ensured through comprehensive defense-in-depth security in the state data center and secure state network. Data Hub and SLDS systems have been assigned the highest-security classification available and have security controls, settings, and policies equal to or more stringent than those for administrative data covered by FERPA, CJIS, HIPAA, or CMS. Only a limited number of authorized state employees can work with identified data to facilitate record linkage, testing, and validation.

All data sharing agreements specify methods and procedures for assuring compliance with any applicable regulations. Privacy of public use data is protected through disclosure avoidance techniques and disclosure review processes. Privacy of individual-level deidentified data access for research is protected through a [Five Safes](#) framework.

## Planned Reports and/or Deliverables

We are developing capacity to conduct analysis and research at multiple levels to increase the state's ability to use data and evidence to drive improvements in policy and practice:

- **Enterprise-level data analytics team** to provide centralized shared services, coordination, and support across multiple agencies. This team focuses on projects that use cross-agency integrated data and/or have implications for programs/services across multiple agencies. The team also facilitates collaboration and solutions sharing across agencies and states.
- **Increase agency-level capacity through project-based training and support.** The state plans to deliver project-based training focused on workforce performance that will help agency-level analysts develop new skills and data-driven solutions. This effort is supported by Arkansas' participation in the Coleridge Initiative where we have worked with other states to develop new approaches for analyzing unemployment claims.
- **Coordinate higher education research capacity.** The state university system is a reservoir of subject-matter and research expertise. We plan to leverage this capacity by identifying researchers in key priority areas and establishing an ongoing working relationship with them by which we can routinely call on their expertise to assist on projects that require deep expert knowledge and/or more intensive analysis.

The key policy questions the state intends to use the expanded SLDS to answer include:

- The outcomes of co-enrollment strategies and potential benefit cliff effects
- The equity of program participation. Who is falling through the cracks and why?
- The cost effectiveness of programs
- SNAP/WIOA policy topics such as spillover effects, duplicative services, and metrics



Stakeholders can use the enhanced data, products, and capacity to:

- Analyze gaps between occupational demand and credential/skill production
- Support timely planning and allocation of limited resources in a dynamic environment
- Identify underserved demographics and inform targeted outreach and resource allocations
- Inform continuous program alignment, improvement, and referral strategies
- Track participant progression into the labor market and across career pathways
- Examine the impacts and cost effectiveness of education and workforce programs
- Analyze barriers to participation and impacts of interventions and wraparound services

The extensive research and analysis products that will be generated include:

- **Statewide Skills Gap Analysis** – Expand the successful postsecondary supply/demand gap analysis model and reporting with more granular skills-based supply/demand gap analysis and expansion beyond occupations requiring postsecondary credentials.
- **Underserved Communities Analysis** – Extensive analysis on analytic methods for identification of demographic disparities in service receipt at the state and regional levels.
- **Co-enrollment Outcomes Analysis** – Extensive research, analysis, and reporting on the frequency, patterns, outcomes, and barriers (cliff effects) of parallel and serial program co-enrollments and credential attainments to inform optimal co-enrollment strategies.
- **Work History Outcomes Analysis** – Extensive research, analysis, and reporting into the impact of work history coupled with credentials and education on participant outcomes.

All research and data products will be documented, repeatable, based on standard data models, and shared for implementation at interstate and Federal levels. The state plans to inform, support, validate, and implement the above research and products via interagency, cross-sector, and interstate communities of practice and repeatable applied analytics training programs.

## **Dissemination to Public**

Workforce provider performance information and outcomes will be disseminated to the public once developed via easy-to-use self-service dashboards on the state's open data portal, which is based on the Socrata Open Data & Citizen Engagement Portal and embedded Tableau dashboards. Access to longitudinal data and products will also be embedded in the [Ready for Life](#) statewide learning management platform for delivery with personalized and regional context. All public-facing data products are subject to statistical cell size suppression, top/bottom-coding, and other disclosure avoidance techniques to ensure privacy and compliance.

## **Organizational, Administrative, and Fiscal Capacity**

### **Applicant Organization**

The mission of the Arkansas Division of Workforce Services (ADWS) is to support and secure Arkansas' economic vitality through a highly skilled workforce by administering programs and providing efficient services that empower employers and job seekers. ADWS services can be categorized into three main groups: Unemployment Insurance, Employment Assistance, and Temporary Assistance for Needy Families, but ADWS also provides products such as Labor Market Information. ADWS offers these services at Arkansas Workforce Centers located throughout the state.

ADWS builds effective partnerships with other organizations to better serve customers. Through these partnerships, ADWS and its partners can leverage each other's core competencies and resources.

## **Organization Under Contract**

The Arkansas Division of Information Systems (DIS) is the centralized information and technology shared services provider for the state of Arkansas. To support this mission, DIS hosts the state network and a pair of centralized state data centers where state data are hosted in a secure, fault tolerant, managed environment with 24/7/365 support. The department houses the positions of the state CTO, CDO, CPO, CAO, CISO and the state enterprise architecture (EA) and state cybersecurity offices. The DIS Data Management and Analytics organization ([ARData](#)) was originally established in 1997 as DIS Data Warehouse to provide statewide data warehousing, data integration, and business intelligence solutions and has evolved to support a full range of modern enterprise information management, research, and analytics needs.

## **Staffing**

The **Chief Analytics Officer** (CAO) serves as the SLDS Program Manager and has 20 years of experience with public sector data warehousing, data management, and analytics, holds an MS in Information Quality, and is an Information Science PhD candidate conducting dissertation research on advancing the field of longitudinal data analysis for increased insights from data.

The **Data Management Lead** supervises a team of data engineers, has over 20 years of public sector data management experience, and holds a BA in Computer Information Systems.

The **Data Analytics Lead** supervises a team of data analysts and data scientists, has over 10 years of public sector data analytics experience, and holds an MS in Information Quality.

The **Quality Manager** supervises quality analysts and has over 10 years of quality, operations research, and higher education experience and holds a PhD in Integrated Computing.

The **Chief Privacy Officer** (CPO) has 18 years of legal and database development experience, holds a JD in Law, and served as the attorney for the state education agency for 4 years.

## **Fiscal and Administrative Controls**

The Division of Information Systems (DIS) is a billed central service entity per a Cost Allocation Agreement State and Local Governments (CAASLG) and is bound to the guidance provided in 2 Code of Federal Regulation 200 (2CFR200) regarding cost allocation for state shared services. Per 2CFR200, billed central services are to bill using rates established by the State, based on the estimated costs for providing services and adjusted to actual allowable costs. Under 2CFR200, DIS must separately account for all revenues, expenses, and profit/loss generated or incurred by the services, maintain independent fund balances per service, and monitor cost recovery against 60-day working capital allowances. DIS monitors the funds balances monthly and adjusts rates annually to adhere to the 2CFR200. Ad hoc rate adjustments are done during the year if there is a need to adjust a rate prior to the annual rate adjustment process. This is typically done when there is a contract renegotiation which significantly changes the cost of the service.

## **Data Governance**

The executive data governance structure for the state is the Data and Transparency Panel (DTP) established under Arkansas Act 912 of 2017. The Chief Data Officer (CDO) and DTP oversee development and management of the Statewide Longitudinal Data System (SLDS) per Arkansas Act 936 of 2019. An SLDS subpanel of the DTP is comprised of agency data officers for routine SLDS data governance and data change management.

All data sharing agreement, privacy, and disclosure review policies and procedures are governed by the Chief Privacy Officer.

Support for operational data governance is provided by self-service platforms for metadata management, data quality management, data governance, and data lineage.

## **Past Performance**

### **Lead Applicant's Prior Experience**

Arkansas received \$1,064,377 of Workforce Data Quality Initiative funding in Round 5 for the fiscal year 2015. As referenced above, these funds were used to establish a longitudinal database, administered by the Arkansas Research Center. All objectives of the grant were successfully met.

The state successfully established a database that produced the Economic Security Report, which is very similar to the WIOA required reporting for Eligibility Training Providers. At that time, many of those requirements had not been implemented for WIOA, but Arkansas was well positioned to report on WIOA and non-WIOA clients. The database included primarily post-secondary and wage data, which have been in place and maintained to produce the Economic Security Report annually since 2015.

To demonstrate the Arkansas Division of Workforce's experience improving the quality and breadth of data, specifically those data and reports that enable customers to select training programs informatively, please see the most recent version of the [Economic Security Report for 2020](#).

The work performed under WDQI round 5 provides a solid foundation for expansion under this project to go beyond postsecondary outcomes and provide workforce development stakeholders with information to make informed decisions on a broader range of programs and outcomes as well as focused research into key related policy areas for improving programs and outcomes. Additionally, please accept the attached data sharing agreements and plan described in this application as further evidence of the state's ability to expand the integration and use of longitudinal administrative data should Arkansas be selected for Round 8 funding.

## **Partner's Experience**

The CDO office has been actively engaged since established in September 2017 with promoting and supporting increased sharing, integration, and use of state data assets. Arkansas was selected by the National Governor's Association to participate in the "Harnessing the Power of Data to Achieve State Policy Goals" project to address governance, cross-sector data sharing, and systems capabilities to enhance data informed policy and capacity building across state agencies. DIS has been providing data integration, data warehousing, data management, business intelligence, application development, and database administration services since 1997. DIS staff have significant experience in designing, implementing, and managing statewide information systems. Of particular relevance to the successful implementation of this project is DIS' expertise in data integration, master data management, data federation, business intelligence, analytics, data quality management, data governance, security management, web application development, and web service development.