

# The Roadmap to a North Carolina Longitudinal Data System (NCLDS)

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This work was completed under a memorandum of understanding (MOU) between the Government Data Analytics Center (GDAC) within the Department of Information Technology (NC DIT) and the University of North Carolina at Chapel Hill (UNC-CH) regarding the provision of services to support a study evaluating how to modernize and increase interoperability of the North Carolina Longitudinal Data System.



## Background

North Carolina is at the forefront of a national movement to leverage longitudinal data systems (LDS) to inform policy decisions. Through the prior efforts of stakeholders—NC Department of Commerce (NCDOC), NC Community College System (NCCCS), NC Department of Health and Human Services (NCDHHS), NC Independent Colleges and Universities (NCICU), NC Department of Public Instruction (NCDPI), and the UNC System—much progress has been made in the collection of data and the creation of targeted data systems.

As the policy and program landscape becomes increasingly complex, there is an increased need for better data and analytics to help navigate complex decisions. An LDS can help North Carolina move from collecting data for compliance and accountability purposes to using data to support evidence-based policymaking, continuous improvement, and performance management. It can increase our knowledge of the opportunities and challenges that North Carolinians experience as they transition from early childhood, through the education system, and into the labor market. A North Carolina Longitudinal Data System—NCLDS—can enable the systematic use of evidence to guide decision-making and to improve citizens' lives.

### LDS Milestones in North Carolina

- 1992** The Common Follow-up System (CFS) was initiated to provide information on the educational and employment outcomes of participants in publicly supported educational, employment, and training programs.
- 2011** The Early Childhood Integrated Data System (ECIDS) was initiated to track program participation and to inform policies and practices that produce better outcomes for children and families.
- 2012** North Carolina SchoolWorks (NCSW) was initiated to select and provide access to information on cohorts of students, schools, and program data over time.
- 2016** The NC Department of Information Technology's (NCDIT) Government Data Analytics Center (GDAC) was charged with developing an implementation plan to phase in the establishment and operation of a North Carolina Longitudinal Data System.
- 2018** Governor Roy Cooper requested that the NC Education Cabinet convene a working group to plan for a broader North Carolina Longitudinal Data System.

## The Charge from the Education Cabinet

In 2019, GDAC entered into an MOU with the University of North Carolina at Chapel Hill (UNC-CH) to develop a strategic plan to modernize the NCLDS, grounded in the needs and priorities of policymakers, program leaders, and participating agencies. The team conducted over 40 interviews with stakeholders, including executive leadership, program managers, and technical leads within key agencies to understand their vision for an integrated state LDS, and the opportunities and challenges it would present.<sup>1</sup> The team also interviewed longitudinal data users and managers from other states to learn about their systems and processes. The perspectives of NC stakeholders, experts from other states, and evidence-based, best practices shaped this report and roadmap for building an NCLDS.

### A Note on Terminology

Interviews with stakeholders revealed confusion and/or conflicting perceptions around the term “educational longitudinal data system” or ELDS. Some stakeholders used ELDS to refer to an individual existing LDS and other stakeholders used it to mean a broader, integrated longitudinal data system that would encompass the functionality of the three existing systems: CFS, ECIDS, and NCSW. The report will use the term **North Carolina Longitudinal Data System (NCLDS)** to identify a modernized longitudinal system that will build upon the three existing systems in North Carolina.

### Shared Vision for NCLDS

The UNC-CH team interviewed stakeholders to understand their long-term goals and business priorities for a longitudinal data system. Stakeholders agreed that a comprehensive longitudinal data system would be a valuable tool for collecting and disseminating data to inform policy and program decisions.

Stakeholders shared a range of perspectives on data system specifics, but there was substantial consensus on the following points:

- NC’s most pressing questions should drive the content and functionality of a modernized NCLDS to support data-informed decision-making;
- NCLDS partners should collaborate to define procedures and safeguards to protect individuals’ privacy; to ensure data security; and to establish a transparent process for authorizing tiered access for different user groups;
- NCLDS should be designed to alleviate rather than to increase the workload for existing technical and program staff; and
- Analytical capacity should be strengthened to ensure that NCLDS data are transformed into actionable insights.

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<sup>1</sup> We would like to thank the many people who generously shared their time, expertise, and perspectives during the research and writing of this report. For a full list of project interviews, see Appendices 1 and 2 in the full report.

## Trust as the Key Building Block


NC stakeholders viewed trust as the key building block to an effective NCLDS. Each acknowledged that existing agency “silos” undermine trust and limit awareness, understanding, and use of data across entities.

Stakeholders shared a range of perspectives about how trust factors into NCLDS modernization efforts. Trust bolsters relationships between individuals—from system leaders to program and data experts—to improve collaboration across agencies. Partners described how ambiguity around longitudinal data system leadership and vision have strained trust between the partners and have contributed to overall project fatigue.

Trust can be strengthened by a transparent, formalized process that authorizes access to and use of NCLDS data, and by a secure technical infrastructure, housed by a neutral entity, that safeguards high-quality, confidential data. All partners agreed that NCLDS governance would play a pivotal role in building trust and reducing silos.

## Recommendations

NCLDS should be designed to support evidence-based policymaking, continuous improvement, and performance management. These recommendations reflect an assessment of steps that North Carolina must take to establish a system with the capacity to inform decisions regarding policy and programs along the early childhood, Kindergarten-Grade 12 (K-12), higher education, and workforce continuum. The recommendations are organized topically (rather than sequentially) into eight categories. Collectively, they put the people and processes in place needed to support NCLDS. These conclusions are based on interviews with NC stakeholders, discussions with system experts in other states, and a review of best practices from recognized experts such as the U.S. Department of Education’s State Longitudinal Data System (SLDS) project, the Data Quality Campaign, and Actionable Intelligence for Social Policy.<sup>2</sup>

The recommendations are designed to nurture trust by structuring stakeholder engagement, governance, analytical and research capacity, and sustainable investments to provide transparency and to facilitate collaboration across partner agencies and entities. The recommendations marked with  are part of a comprehensive strategy to build trust.

**Recommendation 1:** Affirm the NCLDS vision as a “system of systems” that links data from across agencies and over time to support evidence-based policy, performance management, and continuous improvement:

- Eliminate use of the term ELDS in outreach and education efforts to ensure clarity regarding the relationship between NCSW and NCLDS.
- Use the term NCLDS to identify a “system systems” that links data across early childhood, K-12, postsecondary education, and workforce. Beginning

Figure 1: NCLDS Vision





<sup>2</sup> For a list of electronic reference materials, see Appendix 7 in the full report. Figure 1 adapted from [The Integrated Data System Approach: A Vehicle to More Effective and Efficient Data-Driven Solutions in Government](#).


immediately, employ the term NCLDS consistently in documentation, communication, and related online resources.

- Revisit General Statute 116E to address ambiguity regarding NCLDS definition, location, and governance. NC stakeholders identified the following examples of ambiguity:
  - §116E is titled “Education Longitudinal Data System,” although §116E-5 creates the “North Carolina Longitudinal Data System.”
  - §116E-4 specifies the powers and duties of GDAC, but §116E-5(a) states that the system will be located administratively within the Department of Public Instruction.
  - §116E-4(a) directs GDAC to establish a committee on data quality but does not confer authority to establish a governance structure to coordinate participation of partner agencies.

**Recommendation 2:** Craft a stakeholder engagement strategy to build support for NCLDS:

-  Leverage Education Cabinet support for NCLDS to secure buy-in from the General Assembly and key system and agency decision-makers.
-  Engage a broad group of NCLDS stakeholders using an equity approach—policymakers, agency leaders, program managers, data contributors, legislative and fiscal analysts, postsecondary leaders, school districts, parents/families, and community leaders—to participate in NCLDS design and to identify questions that it should be able to answer.<sup>3</sup>
- Encourage contributing partners to promote NCLDS’ potential to support data- and knowledge-driven solutions that address policy challenges along the early childhood, K-12, postsecondary education, and workforce continuum.
- Offer user-friendly information sessions for different user groups on NCLDS functionality, including dashboards, analytical tools, and other system outputs.

**Recommendation 3:** Establish NCLDS governance and organizational structures:<sup>4</sup>

-  Establish an Executive Board (by statute) comprised of senior leaders or their designees from each contributing agency. In the interim, appoint an Executive Committee (by administrative action) with the same representation.

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<sup>3</sup> The Hunt Institute’s Informed Decision-Making Collaborative, funded by the Bill and Melinda Gates Foundation, has convened North Carolina stakeholders to identify research questions and begin development of a shared research agenda.

<sup>4</sup> This will require clarifying the relationship between the NCLDS governance structure and existing LDS.





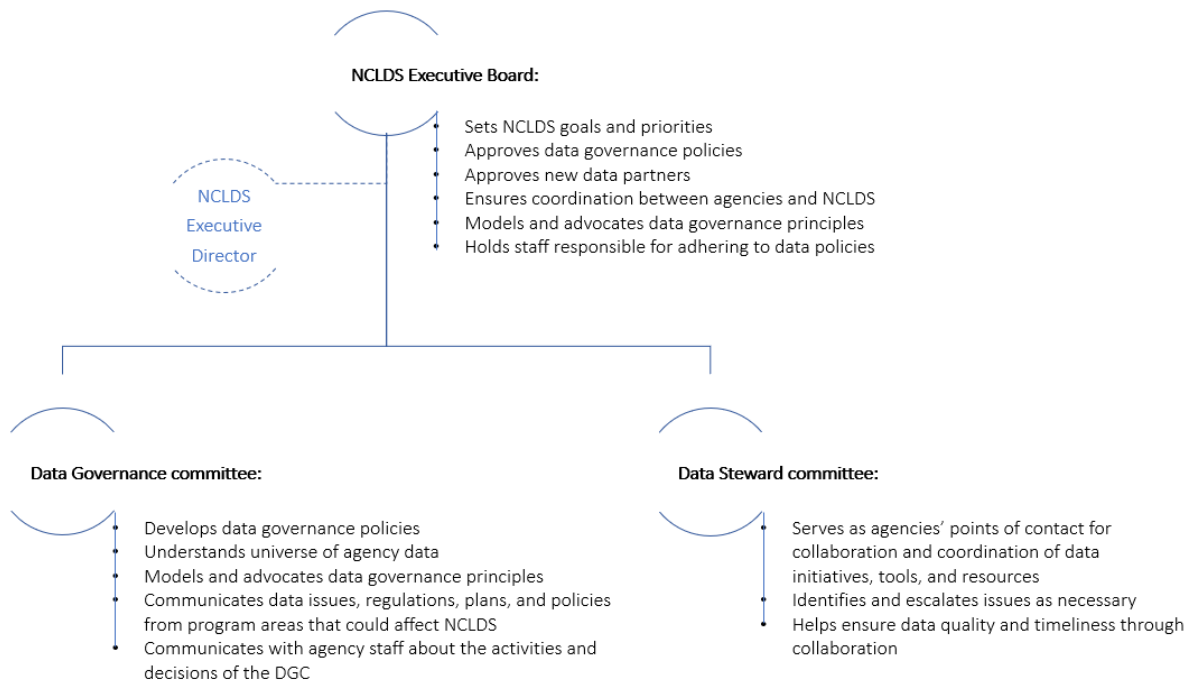
-  Hire an NCLDS Executive Director to oversee the implementation and operation of the system and to act as a liaison between the Executive Board/Committee and NCLDS data governance committees.
-  Name representatives from data-contributing agencies and entities to Data Governance and Data Steward committees.
-  Adopt data governance policies that provide data stewards with control over the use of their data and that build trust in NCLDS as a partner in safeguarding that data.
-  Designate GDAC as the administrative home for NCLDS, leveraging its standing as a neutral entity that has secured stakeholder trust and the trust of the NC General Assembly. This role would be consistent with GDAC’s responsibilities to support NC’s efforts to improve longitudinal data systems.<sup>5</sup>

Figure 2: Proposed NCLDS governance structure



<sup>5</sup> As identified in statute, GDAC’s role in statewide data integration and sharing is to identify data integration and business intelligence opportunities that improve the efficiency and effectiveness of state agencies, departments, and institutions ([G.S. 143B-1385](#)). GDAC currently hosts ECIDS, NCSW, and CFS. Chapter 116E grants GDAC enumerated powers and duties with respect to operation and oversight of North Carolina’s Longitudinal Data System.

**Recommendation 4:** Prioritize NCLDS requirements for a phased implementation:

- Prioritize NCLDS users, starting with policymakers, agency and program leaders next, and external researchers next.
- Document and prioritize functional requirements for a flexible system of inquiry, including standard and customizable dashboards, reports, data stories, knowledge visualizations, research-ready data sets, metrics, and analytics. Identify “low-hanging fruit” (e.g., research-ready data sets) for initial implementation.
- Identify the current data contributors to ECIDS, NCSW, and CFS as initial data contributors for NCLDS.
- Identify and prioritize additional data sources for inclusion in NCLDS over time (e.g., National Student Clearinghouse, U.S. Census Bureau, U.S. Bureau of Labor Statistics data, NC Families Accessing Services through Technology (NC FAST), Juvenile Justice, or NC licensing board data, see Appendix 4).



Communicate the plan to NCLDS stakeholders.

**Recommendation 5:** Develop a system architecture to meet NCLDS functional and technical requirements:

- Design a scalable NCLDS architecture and system infrastructure to meet the functional priorities identified by NCLDS governance.



Include NCLDS stakeholders in the system design process to ensure that the technical infrastructure has the flexibility to support NCLDS’ short- and long-term goals and the safeguards to address concerns about data quality, data security, and data privacy.



Form a working group to broaden and to formalize discussions about data quality issues that need to be resolved.



Coordinate and further develop data privacy practices and procedures with data contributors.

- Establish a centralized system for entity resolution. In the interim, NCLDS can use source systems’ unique identifiers and manual crosswalks. Over the longer term, leverage GDAC’s Enterprise Entity Resolution (EER) to provide a consistent and scalable mechanism for linking data and adding data sources over time.<sup>6</sup>

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<sup>6</sup> Research and development on EER methodology are already underway.

**Recommendation 6:** Build analytic capacity to support NC’s evaluation and research priorities:



Hire a Director of Analytics and Research early in the process, who will report to the Executive Director, to oversee the internal analytics team, as well as to serve as the interface with external research partnerships. The Director of Analytics and Research would implement a plan based on the priorities set by the NCLDS Executive Board/Committee.



Establish an internal analytics team with subject matter expertise to support evidence-based policymaking, continuous improvement, and performance management.



Implement a staffing strategy that offers training rotations and/or dual employment in NCLDS and contributing agencies and entities to build cross-agency program and data fluency for new and existing analytic staff.

**Recommendation 7:** Develop an external research agenda to prioritize data requests and the formation of research-practice partnerships:



Create a collaborative, NC (internal) policy research working group composed of agency representatives, subject matter experts, and practitioners to develop a research agenda<sup>7</sup> and to enhance understanding of cross-agency priority areas.

- Design a framework that prioritizes data requests that are aligned with the research agenda, and that supports the formation of (external) research-practice partnerships.



Establish research approval requirements to ensure that (a) originating agencies approve data use and provide aggregated or de-identified data, (b) researchers maintain active IRB approval status and comply with NCLDS research review requirements, and (c) research findings are made available to the public as deemed appropriate by NCLDS governance committees.

- Create research-ready datasets to guide external researchers and applied policy analysts toward priority topics within the research agenda, providing researchers with high-quality data while making more efficient use of staff time than responding to “one-off” requests.
- Form research-practice partnerships to augment the capacity of the state and its agencies to undertake large-scale research and evaluation initiatives.

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<sup>7</sup> This group would continue the work started under the Hunt Institute’s Informed Decision-Making Collaborative.



**Recommendation 8:** Develop an action plan to identify immediate next steps and to secure sustainable funding for NCLDS design, implementation, and operation:

- Move NCLDS forward in the short-term by: (a) asking the Education Cabinet to endorse an action plan, (b) reallocating existing resources to staff key NCLDS positions in the interim, including an Executive Director, (c) establishing the Executive Committee (administratively) and the Data Governance and Data Steward committees, (d) prioritizing functional requirements and identifying “low-hanging fruit” for initial implementation, and (e) estimating the technical and non-technical resources needed from each agency.
- Advocate for state appropriations with support from partner agencies to fund: (a) NCLDS design, (b) initial NCLDS implementation and source system upgrades, (c) system maintenance and operations, and (d) staffing costs for positions dedicated to NCLDS analytic and technical operations.
- Leverage federal and private foundation grant opportunities to support key priorities of stakeholders in piloting new functionality, adding data sources, and forming research-practice partnerships.

# A Roadmap to NCLDS

*Putting people and processes in place*

