Through detailed case studies provided by members of the National Forum on Education Statistics (Forum), this document offers an in-depth look at the challenges, successes, and lessons learned from education agencies in their data governance efforts, with specific attention focused on the ways in which these agencies have envisioned, maintained, and improved their programs.

West Virginia: Improving Data Quality through Better, Broader Access

The West Virginia Department of Education (WVDE) began instituting formal data governance with the assistance of a Statewide Longitudinal Data System (SLDS) grant in fiscal year (FY) 2012. To build a formal data governance structure and protocols, WVDE engaged leaders and staff across all divisions and among key partners and stakeholder groups. The resulting multi-tiered system of data governance included

- a Data Policy Committee to establish priorities and an overarching vision;
- a Data Governance Committee to manage the bulk of implementation and information sharing; and
- a group of Data Stewards to serve as liaisons and advocates for their program areas.

WVDE leaders fully supported the institution of formal data governance structures, processes, and changes aimed at improving data quality, appropriate access, and use.

As many education agencies have experienced, work at the WVDE often happened in silos with limited cross-collaboration. Although the data stored in the West Virginia Education Information System (WVEIS) served as the source for all federal and state reporting, management of, knowledge about, and access to the system were limited to the data office (that is, the management and information systems staff members who maintained the databases and operation of the system). Generally, data ownership was assumed to reside with the team managing the data system rather than with the offices responsible for supporting and monitoring the work represented by those data. The team in the data office did good work maintaining and improving the data system; however, program office staff were not consistently involved in discussions or decisions related to the system or the data stored in it and had no access to review data or provide data-related support and assistance to local staff. Further, program staff needed to request reports from the data team, but those reports were not always handled consistently or in a timely manner. Lack of consistent communications processes meant that program staff could not identify potential issues or errors in data until after submissions, and that data staff were not always informed of rule changes. Data were continually being corrected for weeks or months after collections. The division of labor tended to result in feelings of frustration on all sides, with program staff also feeling powerless and data staff feeling overworked.

> WVEIS is a centralized statewide student information system that all districts must use as the system of record for student-level education data (per state law).

Working Toward a Solution

As the state education agency (SEA) began implementing formal data governance in 2012, WVDE had the opportunity to rethink how responsibilities for education data at the state level were distributed. Leaders started by focusing on issues of data ownership and job responsibilities. The message presented by the data team was that the data process would actually become easier for everyone if program offices took ownership of their data and ensured its accuracy. They have

built relationships across the groups that have allowed data stewards to ask questions earlier in the process and improve data quality overall. Discussions among data governance stakeholders and the formulation of new processes allowed WVDE to rethink and reconfigure relationships and responsibilities. Doing so allowed program staff to have greater access to and ownership of the data for which their offices bore primary responsibility.

A key turning point in this process was the recognition that state-level program staff needed access to the data system to effectively perform their jobs. In the past, there had been an assumption that only data team members had a legitimate interest in accessing the data system for the purposes of performing their job responsibilities. However, through discussions initiated in data governance bodies, stakeholders arrived at a new understanding of access needs and the permissibility of access within the boundaries of privacy regulations. Consequently, a new process was instituted to provide data system access to program staff who had a legitimate need to view data for the purposes of

- monitoring local program implementation;
- reporting pursuant to state and federal requirements; and
- providing support to local educators and administrators.

Program staff then could see the data in a more timely manner, resulting in more timely identification of issues or errors. Additionally, data staff were relieved of the responsibilities of creating certain types of reports that program staff could easily access through the data system.

As a result of the data governance work conducted within the WVDE, data quality and use have improved greatly. Data are cleaner and timelier. As common errors have been identified and addressed, the department has established and implemented more sophisticated data error checks in real time to proactively address and fix data errors before data collections. All data stakeholders–and particularly program staff–understand data better, feel a greater sense of ownership, and encourage greater use of the information at both the state and local level. The improvements in data quality and access have enabled WVDE staff to move beyond basic administrative uses of data (for example, state and federal reporting) to the essential work of using the information to support local staff engaged in school improvement efforts.

Importantly, data governance structures and processes have created greater collaboration and trust among offices at the department. Staff have an improved understanding of the various responsibilities and constraints of their colleagues in different offices and roles. Stakeholders generally recognize that multiple offices may have vested interest in ensuring the accuracy and appropriate use of data related to their work. Over time, improved access and the reallocation of certain responsibilities has allowed WVDE to more fully integrate operations between program offices and the data team. Although the department occasionally struggled to overcome ingrained ways of thinking and doing (such as the perception that all data-related work was the responsibility of the data team only), staff in the department have greatly improved inter-office collaboration and have cultivated a greater understanding of one another's work, needs, and constraints.

The Importance of Leadership

Throughout this evolution, support from leaders has been critical. In the early stages of data governance development and implementation, clear and vocal support from department leaders was essential for bringing the right stakeholders to the table and cultivating buy-in. As preliminary goals were met, leaders provided strong direction and support for achieving new goals (for example, moving from access to improved quality). WVDE leaders have been key factors in encouraging all department staff and local leaders to work together and find solutions.

Louisiana: Encouraging Buy-in for Data Governance through Data System Development

The Louisiana Department of Education (LDE) began work on its data governance program in 2012, when the state received its first SLDS grant. At the time, few stakeholders in the agency were aware of the need for data governance, but because data governance was required as part of the SLDS grant, the team began to research and establish a program.

In the beginning, LDE primarily leveraged materials and support from a contractor. The team researched what other resources were available from other states or other entities but found that there were not many data governance resources in the educational space. They therefore developed their own data governance policy and training and then rolled it out to the agency. The data governance director worked with the contractor for the SLDS as well as the SLDS Support team, and then with internal agency executive staff. As staffing has changed over the years, more and more data staff report to the same assistant superintendent, which has been helpful for data governance.

Before implementing the new data system, the team traditionally identified data stewards by reviewing all the data collected and then selecting the person considered responsible. However, as part of the new data system implementation, the team tried a more strategic path. They shared information with executive staff about the development of the system and overall goals for the implementation and asked the executive staff to identify staff members to represent their areas. This helped the data team establish a group of subject matter experts (SMEs). They then narrowed the list to create a manageable group of data stewards. The data team pulls together the SMEs in various groupings depending on the issue at hand, and the data stewards help make final decisions and resolve conflict. Executive staff are updated when there are issues that affect the entire agency.

LDE's data governance working group is comprised of data analysts. Through their collaborative work, analysts have found that much of their work is interdependent, and they are able to ensure that the analytics staff are not operating in silos. Though it was difficult in the beginning to convince staff to bring data issues to the group, team members now attend regularly and submit items to be discussed. Participants are expected to share their current major work streams during weekly meetings, which allow the group to address issues and identify areas of interdependency.

As the data governance program was in development, LDE used the working group composed of data analysts to build support for data governance from the ground up. Members of the group limit the use of the term "data governance," and instead focus on the processes and structures needed to make the data system development successful. Through this process, they are trying to establish practices that can carry through after the system development is complete.

Facing a Challenge: Personally Identifiable Information (PII)

Due to a state law, LDE can no longer receive student PII. As a result, LDE created a system of unique identifiers that the school systems assign to each student. As students transfer from school to school, issues can arise with multiple unique identifiers per student. Data governance helped to solve the issue of multiple unique identifiers by providing a means for bringing staff together to share their needs and concerns and find a solution.

Arkansas: Developing Data Governance over Time

The implementation process for data governance at the Arkansas Department of Education (ADE) began in the early 1990s under legislation that required ADE to make extensive use of information technology at the state and local level, in order to provide accurate and timely information to policymakers and to reduce the state reporting burden. The early legislation required the implementation of a statewide computer network that would connect all school systems. In the

initial development of this network and statewide data collections, ADE created the Statewide Information Systems (SIS) handbook. This provided a data dictionary that directed local education agencies (LEAs) in data submission to the state. The statewide data collections provided the source data for both state and federal reporting.

Early data governance efforts centered on streamlining the multiple systems and processes involved in the implementation of the statewide computer network. The members of the team who were tasked with streamlining the systems and processes consisted of individuals from Student Management System; Financial Management System; and Division of Research and Technology; which currently has been split into two separate offices, Research and Technology and Information Technology.

Under guidance from an outside advisory group, ADE moved forward in its data governance by adding the Data Steward Review Committee (DSRC). The committee members included representatives from all divisions of the department, including those teams already focused on streamlining systems and processes. DSRC was initially tasked with automating annual state-level reporting by LEAs. As the siloed manual reporting to the state began to decrease through the collective efforts of the committee, the committee's duties and responsibilities shifted to reviewing researcher requests for data.

DSRC began undertaking its new assignment to review data requests by restructuring the committee. Previously, DSRC was housed under the Division of Research and Technology, and the division lead appointed a chairperson for the committee. The restructured committee was designed to be cross-functional and to include representatives from each ADE Division, as well as legal services. Each ADE Division is represented by three members who are considered SMEs in their program or division. The committee members worked collaboratively to develop the policies, procedures, and standards that would work across the agency; these are documented in the ADE DSRC Handbook. The handbook also outlines the roles, responsibilities and guidelines for the structure of the committee, and it provides guidance for other areas of data governance, such as data privacy and security. As the committee undertook their work to review research data requests, they created the forms, applications, and procedures needed for the request process.

ADE's implementation of the SIS data dictionary, updated technologies, and multi-thread processing allowed data to be pulled in more easily and frequently, on both a nightly and on-demand basis. As more data became available, the demand for data from stakeholders, researchers, the public, and legislators increased. In an effort to meet these demands, ADE began to develop data centers and data reporters. ADE created a unit solely for the purpose of fulfilling data request needs. Since the unit was dedicated to reporting, few requests for data were denied.

As part of its work to effectively manage data requests, ADE implemented systems to monitor and track requests and ensure the protection of student data privacy and security. The monitoring and tracking systems have since evolved into ADE's Request Management System (RMS) for internal stakeholders/program offices and Data Research Request Application (DRRA) for external stakeholders and researchers.

Automated data feeds from nightly systems have enabled data availability and transparency, and ADE provides data back to districts and other stakeholders via My School Info (https://myschoolinfo. arkansas.gov/), which allows the public to search and compare public schools and districts across the state, and SIS Reports, which is a collection of public data from Arkansas K-12 Public Schools.

Through the SIS, users can access report statistics on topics such as bus counts, course enrollment totals, finance, student demographics, teacher and staff counts, and much more. Data Reports are available based on a variety of subject areas at the SEA, county, LEA, and school levels.

The Statewide Information Reports are sourced from the ADE State Data Warehouse, which is populated using certified data submitted by LEAs nine times a year.

Leveraging Data Governance: Supporting Civil Rights Data Collection (CRDC)

Recently, Arkansas leveraged the Statewide Information Systems Data Warehouse to provide support to LEAs. Arkansas aided in data submission to the Office for Civil Rights biennial data collection by pre-populating data on behalf of LEAs. The 2017-2018 data submission marked the first year Arkansas was able to assist LEAs in this capacity. The data governance teams were instrumental in determining data availability sourced from the state data warehouse. The support to LEAs resulted in a considerable reduction in hours spent gathering the required data for the collection.[1]

Developing Over Time

Through the development of its data governance program, ADE has found it challenging to keep up with changing and emerging technologies, particularly during times of staff turnover, changes in leadership or agency restructuring. Data leaders in the state note how time-consuming the development process is and suggest that education agencies focus on collaboration among offices and departments while developing and implementing a plan. They also recommend ensuring that SMEs and data stewards have key roles on various data governance committees.

Kentucky: Cross-Agency Collaboration Builds Robust, Sustainable Data Governance

The Kentucky Longitudinal Data System (KLDS) is a centralized data system managed by the Kentucky Center for Statistics (KYSTATS), an independent office within the Education and Workforce Development Cabinet. KYSTATS state legislation provides that education and workforce agencies shall provide data to the KLDS, and KYSTATS has data sharing agreements and state statutes that authorize it to receive data from multiple state agencies, including

- the Department of Workforce Investment, Unemployment Insurance;
- the Kentucky Department of Education;
- the Kentucky Education Professional Standards Board;
- the Kentucky Council on Postsecondary Education; and
- the Kentucky Higher Education Assistance Authority.

These state agencies have formalized data sharing outside state legislation, which authorizes KYSTATS to receive data beyond education and workforce data.

Collaboration Across Agencies

The state's strong data governance began with the designated structure of the KYSTATS board. Agency heads from Kentucky's education and workforce agencies all serve as members, so the board includes the Secretary of the Education and Workforce Cabinet, the President of the Council for Postsecondary Education, the Commissioner of the Kentucky Department of Education, and the Executive Director of the Kentucky Higher Education Assistance Authority. In July 2019, an amendment to the legislation also added the Secretary for the Cabinet for Health and Family Services to the KYSTATS board.

The work of KYSTATS is governed by a biannual research agenda developed by representatives from each agency, who are appointed by their respective board member. The Board approves the

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1   For more information on other SEAs that have assisted LEAs with CRDC submissions, see the *Forum Guide to Reporting Civil Rights Data*, available at https://nces.ed.gov/forum/pub_2017168.asp.

research agenda for KYSTATS and approves any new agency's data to be included in the KLDS. The KYSTATS board meets quarterly to be informed about and provide feedback on the progress of work aligned with the research agenda. This process ensures support for the continued development and use of the KLDS. It also ensures sustainable support for working collaboratively both with and through KYSTATS on cross-sector policies and issues.

Strong data governance is further promoted by required input and sign-off from each partner before a report is released to the public. All reports and data requests fulfilled by KYSTATS are reviewed by each agency whose data are included. The agency has 10 days to complete the review. All individual-level, de-identified requests are also reviewed and approved by each partnering agency.

Continuing Success

Through strong leadership and guidance of the Board over the years, KYSTATS has matured to one of the most robust longitudinal data systems in the nation. The early data governance model built trust and respect across the Commonwealth, which created opportunities to approach other data partners about sharing data that could answer critical questions for Kentucky. The KLDS has more than doubled in partnering agencies to create a data system with over 6,500 data elements over 10 years of time. The first high school feedback report was created in 2012, and KYSTATS published more than 30 reports and fulfilled more than 200 data requests in 2018. This growth and success would not be possible without the strong data governance in place with agencies on our Board, as well as additional partnering agencies who provide data.

Nebraska: Maintaining Flexibility as Needs and Structures Evolve

Nebraska's data governance program developed through an evolving process over the past two decades, with Nebraska Department of Education (DOE) staff, the Administrator of Federal Programs, and data, research, and evaluation staff all involved. While initial governance efforts centered on a project team working to modernize data collections, this team and subsequent approaches to data governance evolved to reveal a program that continues to change and mature as issues, topics, and discussions shift.

An Evolving Process

The first movement toward recognizing data governance was acknowledging the burden that data collection placed on LEAs. In an early effort to discuss data burdens, the DOE printed all the forms required by LEAs to complete. These were posted prominently on a long hallway (both sides) at the DOE and created a "wall of shame" intended to highlight duplication and dramatize the data burden felt by districts to the SEA staff. This visual illustration of the problem led the DOE to develop new processes and highlighted the importance of engaging LEAs in data governance. DOE leaders recognized that while consolidating data reporting efforts and reducing the reporting burdens would be beneficial, any consolidation efforts had to be undertaken thoughtfully to ensure data quality.

Over time the student-level data collection process was implemented, and a project team was charged with determining key aspects of the process, such as the types, frequency, definitions, and calculations of the data collection. The "implementation project team" transitioned to a formal Data Collection Committee (DCC) as data collection processes improved.

In an effort to engage LEAs in data governance, the DOE also created the District Data Collection Group (DDCG), which serves as a connection between the SEA and LEA staff involved in data collection. The group is made up of LEA representatives from the eight-state board of education districts and includes a balance of urban, rural, large, and small LEAs. The group meets virtually

during each month of the school year to discuss implications of required or emerging data collections, discuss data quality issues associated with the reported data, and capture feedback. The group functions as an advisory board to discuss new requirements, potential barriers or issues, unintended consequences, and other concerns, and it communicates with specific staff working with data in the schools to test practices, refine approaches, and be aware of emerging changes.

Focused on continuous improvement, the DCC recently refined the process used by different program offices to bring questions to the group. If, for example, the Accreditation Office asks about block scheduling, an evaluative discussion to determine recommendations is held by the agency's DCC as a formal process, and considers what, if any, operationalization recommendations may arise. The DCC Committee then engages the DDCG, if appropriate, to refine operation approaches.

Lessons Learned

Early versions of data governance focused on project implementation. This approach proved effective for meeting specific data collection and systems goals. But over time, DOE leaders realized that they needed overarching process and procedures. The DOE aimed to develop a formal data governance structure to clarify reporting structures and answer questions about how various groups, such the Institutional Review Board, DDCG, and Curriculum Committee, were integrated into the data governance process. Though the word "governance" can create perceptions of something rigid and structured, DOE leaders quickly realized that governance is most effective when the rules and procedures evolve from the needs of the organization, rather than implementing a set of top-down requirements. It is critical to identify the purpose of data governance–for example, by focusing on how data are used and what questions must be answered–and develop rules that meet the data-related needs of the agency. Moreover, data collections often change, and it is important that data governance structures remain flexible so that they can be modified to meet the changing needs of the agency.

As they try to use these practices moving forward, the Nebraska team has taken steps such as publishing the data dictionary in Common Education Data Standards (CEDS), and then directing researchers making data requests to use CEDS to refine their questions. This helps discourage the researchers from requesting data the state doesn't have and allows for more thoughtful planning.

Moving Forward

As Nebraska's team continues to refine their data governance, they are still trying to improve in some areas. For example, leaders note ongoing efforts to take advantage of internal efficiencies, such as using automated workflows. Some offices still communicate information in modalities that are not the most efficient, which could instead be automated and routed to appropriate people. Insights could occur prior to meetings, if the right individuals were able to access information more efficiently.

Like many agencies, Nebraska also has continuing issues concerning capacity, as they try to balance increasing expectations with limited resources and time. Who is included in the data governance process, for example, and what is the opportunity cost of not having everyone involved? Leaders are striving to walk a line between engaging stakeholders in a way that does not overwhelm people, and keeping a realistic perspective on what is possible within the larger system. This also includes validating the relationships and governance among external agencies and entities as well (for example, postsecondary education, labor, early learning).

Minnesota SLEDS: Maintaining Cross-Agency Governance and Staying Prepared for Change

Minnesota's Statewide Longitudinal Education Data System (SLEDS) is managed jointly by the Minnesota Office of Higher Education, the Minnesota Department of Education, and the Minnesota Department of Employment and Economic Development. In addition, the Minnesota Department of Health and the Minnesota Department of Corrections provide data to the system. Under state law, the Minnesota Office of Higher Education serves as the administrative and fiscal lead for SLEDS, assuming responsibility for legal and data privacy issues and state funding under the legislative budget process. State law designates the Minnesota P-20 Education Partnership as the official governing body for SLEDS.

The structure and processes for data governance were developed from 2006 to 2009. Because the three lead state agencies (Minnesota's Department of Education, Office of Higher Education, and Department of Employment and Economic Development) did not have an extensive history of data sharing or working collaboratively on key projects, they agreed that a shared model of data governance was the most appropriate in order to build trust and ensure effective management and use of the system. The Minnesota P-20 Education Partnership was chosen as the governing body of SLEDS, given its purpose in state law and its membership, which included all the major stakeholders within K-12 education, higher education, and workforce. The newly established SLEDS Governance Committee charged agency staff and organization representatives with developing policies and procedures for data management and governance. Staff from the three lead state agencies led the design and implementation processes, but the representatives across K-12, higher education, workforce, the legislature, business organizations, and parent groups formed the committee.

In fall 2009, the Minnesota P-20 Education Partnership assumed its role as the governing body for SLEDS. Partnership members were asked to appoint representatives to three committees: the SLEDS Governance Committee, the SLEDS Research Committee, and the SLEDS Data Advisory Committee. Committees reviewed their respective charges and identified policies and processes to be developed. A portion of time the first year was spent learning about the various data sets included in SLEDS and developing a priority list of research questions for the system to answer. Staff then began developing web-based public reports for the committees to review and approve based on the priority research questions developed.

In 2014, the Office of Higher Education received approval for the first release of de-identified individual-level data from SLEDS for a legislatively mandated report on developmental education enrollments by recent high school graduates. This was the first use of a newly approved SLEDS research request application and related approval process. Since 2014, this process has been enhanced (for example, more detailed questions about data security at requesting organizations) and streamlined (for example, eliminated separate approval requirements by participating agencies). In addition, the SLEDS Research Committee and the SLEDS Data Advisory Committee have merged.

The new data governance process allowed participating organizations in SLEDS to establish trust and grow working relationships. The process was built on seven guiding principles for data access and management:

1. SLEDS will focus on providing cross-sector, linked data and analysis.
2. SLEDS relies on transparency and clarity in all we do.
3. Protecting the privacy of individuals is a priority.
4. Common understanding and use of data increase its value.
5. Data providers, at the state and local levels, are critical sources for understanding and explaining the data.

6. Maintenance of SLEDS and the provision of research and analysis is the responsibility of all data providers.
7. Local partner data provider access is needed for data to drive continuous improvement in local and state level policy.

Each organization's application to use SLEDS data is discussed in depth as a group and requests are only approved if consensus is reached. Minnesota also frequently has data requesters present study results to both the SLEDS Governance Committee and the SLEDS Research and Data Committee members so that research findings add to the knowledge base within the state.

Facing Challenges

Minnesota's data governance processes have not been without challenges. The team found that their original web reporting system did not meet the specifications established for reporting and use. Information technology (IT) staff revised the technical specifications and rebuilt components of the reporting system to meet user requirements as identified by the governance process, which caused a one-year delay. Upon release, however, the web-based reports received significant and frequent positive feedback from users.

Another considerable challenge that delayed Minnesota's work was single agency control of the 2009 federal SLDS grant funding. Only state education agencies were eligible to apply, thus a single agency maintained control of funding. SLDS was seen as an IT project, and IT staff only reported to the SEA as a result of the funding process. The SEA IT staff held views that were more consistent with restricted data access than with the multi-agency Governance Committee and multi-agency data use, which resulted in delays. Diversifying funding streams among higher education (state SLEDS funding), workforce (Workforce Data Quality Initiative grant funds), and K-12 (SLDS grant funds), realized the full vision of shared governance.

Staying Prepared for Change

The SLEDS team recognizes that the system will remain in a continual state of change. They regularly make modifications to existing SLEDS reports in response to the needs of users. Likewise, they add data sources to fill identified data gaps, in order to improve understanding for local and state policy uses.

Several data governance policies and processes have changed over time. Specifically, the SLEDS team has developed protocols for opting out individuals within the SLEDS de-identified data when required by state law, developed criteria for allowing data providers access to re-identification codes for individuals they submitted to the system, and made available a fixed set of de-identified individual-level data to every K-12 and higher education organization providing data to SLEDS with approval from the organization's executive.

They have also developed a set of questions for assessing a new data provider's readiness to join SLEDS:

1. At a high level, does your agency have a willingness to engage in a partnership like this? Is leadership onboard? Are your stakeholders willing and able to see the value in sharing data with SLEDS?
2. Is the agency able to dedicate staff time and resources (for example, staff time to document, test, validate and train others to use the data)?
3. Does the agency have legal authority to share these data? Are there other statutory/legal conditions to consider (for example, individual consent)?

4. How are the data collected and stored? Are the data structured in a usable format? How clean are the data? Is there IT capacity to pull data in an agreed-upon format, submit to SLEDS, and respond to questions regarding integration and validation?
5. Has the contributing agency identified data from SLEDS that will add value to reports and information they produce? Has SLEDS identified data from the contributing agency that will add value to reports and information SLEDS produces?

In 2014, the team faced changes when the administration and management of SLEDS shifted from being funded by the Minnesota Department of Education and the U.S. Department of Education SLDS program, to being funded by the Minnesota Office of Higher Education and other state funding. Because the team had strong cross-agency governance and management in place, the transition went smoothly. They have continued with structures and functions as originally envisioned but have adapted policies and protocols when necessary.

Minnesota ECLDS: Incorporating Early Childhood Data into the Longitudinal System

Minnesota's Early Childhood Longitudinal Data System (ECLDS) incorporates birth through third grade data and is overseen by the state Department of Education. ECLDS was developed as a sub-project under the state's Race to the Top Early Learning Challenge (RTT-ELC) grant awarded in 2011, and its data governance was originally modeled after that of Minnesota's state longitudinal education data system (SLEDS), which includes K-12 through postsecondary education and workforce data. The ECLDS was recently named in statute alongside SLEDS as an integral part of the state's P-20W system.

As they modeled the ECLDS governance after SLEDS governance, agency leaders first assembled representatives from each state agency that had agreed to contribute data under the RTT-ELC grant. Each state agency was also asked to identify two professional associations representing their direct practice communities to also provide representatives. They then reviewed and consolidated more than 70 policy questions that were provided to the governance groups for implementation in the ECLDS. Reducing these questions then helped the working groups to identify exactly who needed to be involved in the work, which also informed the development of the data sharing agreements between the state agencies. The ECLDS lead facilitated each step of this process.

As ECLDS governance was developed, it was modified from that of SLEDS to have only a two-part governing process, in which the ECLDS Governing Body makes decisions upon the recommendation of the Research and Data Committee. In the event this two-part structure fails to come to consensus, a small ad hoc group referred to as the Mini Cabinet, composed of agency commissioners, will be convened to break any impasse. To date, this mechanism has not been needed.

A unique governance practice featured in the ECLDS system is the use of consensus decision-making. Rather than a more typical voting structure, Minnesota opted for consensus to ensure that anyone who wants to be part of the recommendation process feels that they have a place at the table. This practice also addressed the concerns of leaders who were concerned that voting practices could weight decision-making heavily toward those members who show up or allow departments to center attention on their own interests by having a strong turnout at a meeting where a pivotal issue was being discussed.

Strengthening Trust and Allowing Continuity

ECLDS governance practices have helped establish greater trust from many of the state's related agencies and offices. Some program areas participating in ECLDS historically made decisions about analysis and data use in isolation from other systems or relevant stakeholders, which caused other

partners in these initiatives to mistrust the results. With ECLDS governance in place, discussions and decisions about the use of data and the work of tackling policy questions now take place in the open and are documented and shared broadly. The governance structure allowed for this openness about intentions, and many staff members have welcomed the change as refreshing.

Established governance also allows process continuity through agency transitions, such as a change in state agency commissioners or a switch in funding sources.

Recognizing the Needs of Users

ECLDS lead staff and governance members acknowledge that they expected most users to believe in the usefulness of the available data and interact enthusiastically with all features of the ECLDS site. However, they learned over time that a subset of users wanted the information the site provided but did not all feel comfortable using the site to find the data. These users tended to be very short on time or lacked comfort using a data site like ECLDS. The ECLDS team later took advantage of an ECDataWorks grant opportunity to develop a user-friendly data story tool (MN Kids Explorer) that contextualizes data and provides key summary points for action.

Metro Nashville, Tennessee: Developing Formal Processes for Data Quality

Metro Nashville's data governance program was developed through an iterative process that focused on data ownership and specified business rules. Prior to the implementation of the data governance program, the district handled data quality through the data specialist role. Each school had a data specialist who entered data that had been filled out and sent to the office. As Metro Nashville moved from this type of data entry to a data system with a point-of-service (POS) data entry, the district also began to restructure how the data process would work, and who would be responsible for data quality and accuracy.

Metro Nashville now has 22 data quality specialists who are no longer entering the data for schools and are assigned to the LEA's Department of Information Management and Decision Support, and the centralized office of Data Quality and Integrity. Rather than working in a school as the person responsible for collecting and entering data, specialists are now responsible for monitoring data quality, identifying the root cause of data quality issues, and guiding and coaching the staff at each school to implement solutions to the issues. The Office also has four managers and two analysts, giving the district far more staff directly devoted to data quality and governance than most education agencies.

As the district made the transition to the POS system, which included transitioning to a system where the person handling the data (whether this be a teacher, administrator, counselor, etc.) was also responsible for entering the data, the number of data errors increased. For a while, the data quality specialists ended up being a clean-up crew for school data. The team was not intended for such work, and it was not an efficient, effective, or sustainable way to address data quality issues. Instead, they began working with all of the individuals handling data to transfer accountability for accuracy back to them. The LEA established a new rule that it is not the job of the data specialists to fix data errors. Rather, they provide support, identify trends in errors, build staff data knowledge and capacity, and monitor data quality in schools. The specialists look for problematic data rules, and work with staff to find solutions and implement corrections when such rules are found. This information from the field is also sent up to decision makers and executives, who are necessary to fuel policy and process development and resolve systematic data issues that require larger scale change.

Metro Nashville also leveraged technology to help ensure data quality. The district used their data warehouse to create a data dashboard that has a number of built-in data quality checks. Business

rules catch and display the errors by category (for example, course coding errors or grading errors), which allows school staff to monitor daily their data and see errors. Beyond this, the data quality specialists look for trends in the errors. These trends can help identify the origin of the problem, such as a data entry staff member who needs additional training or an unclear data definition.

Formalized data governance has improved relationships between data, IT, and program departments. The dashboard–and its ability to quickly identify errors to be corrected–has increased staff confidence in the data, and also created a pathway for communication related to data requirements. For example, program offices, such as English Learners (EL), Special Education (SPED), and Curriculum and Instruction now approach the data team with questions about changes based on state laws. People now know where to go when they have challenges or questions.

Evolving Perspectives

Metro Nashville had wanted to formalize data governance structures for some time but faced challenges related to peoples' beliefs about who is responsible for data tasks. One challenge was the expectation that if something goes wrong with data, staff should turn to IT to solve the problem. Instead, Office of Information Management and Decision Support staff now actively engage data owners who have extensive knowledge about specific areas of data to help them solve data problems themselves. This transition in perspective has also required adjustments in the roles of both IT staff and data support staff: they are now coaches and data teachers who support data collection, reporting, and use by other staff.

The data team also worked to change the perspectives of people who thought that working with data was not part of their job. Some staff believed that only clerks enter data. They needed a better understanding of POS data flows. The Office of Information Management and Decision Support helped staff in schools understand that many of their daily tasks are in fact data-related, such as taking notes; the difference is that now they enter data directly into a data system. Additionally, Metro Nashville's data quality team educated staff about data use. This effort helped staff to move beyond the idea that data entry is an obligatory reporting task and to see how data are being used and applied throughout the district. Policy, legislation, and district procedures all determine what data are entered and how; knowing this helped people understand the need for data and the importance of data quality. Staff now have a better understanding of business rules, which minimized errors and increased accuracy. As staff perspectives changed, the data quality team searched for champions who could encourage others to change their perspective.

The Weekly Meeting

The leadership from the Data Quality and Integrity Office holds a weekly data governance meeting to which stakeholders from across the district can bring data issues. They work through a collaborative facilitated process that helps the stakeholder define root causes and develop solutions to bring back to their office or program. The facilitated process includes templates and a set of questions, and the group is there to help think through solutions. Working with the group also allows people to make connections about their issues and see where there may be collection duplications or possibilities for collaboration. Ultimately, the weekly meeting reinforces the idea of data ownership; the data team facilitates collaborative solutions, they do not fix issues. This is a change from the past, when data problems were seen as something to be handed off.

Northshore School District, Washington: Better LEA-SEA Communication through Data Governance

Northshore School District (NSD) and other districts in Washington have partnered with the Office of Superintendent of Public Instruction (OSPI) to create formal data governance. OSPI has a website dedicated to the data governance workgroup, https://www.k12.wa.us/about-ospi/workgroups-committees/currently-meeting-workgroups/k-12-data-governance, including an overview of the group, a list of members, meeting agendas, and relevant legislation. Before establishing OSPI's data governance group and including data governance in state statute, data staff in NSD found themselves under a great deal of data burden, both from state requirements and from continual requests from various offices within the district. LEA staff realized that the core issue was data governance: they needed better communication structures, clear data definitions, and improved stakeholder knowledge about data.

When LEA staff in Washington began collaborating with the SEA to formalize data governance, they created groups for governance, data use, and other elements of the process. As they moved forward and created better governance structures, they integrated these ideas and brought more people together. They now meet monthly and work through data collection, management, and use questions. Moving to this more scheduled and meaningful level of coordination has allowed SEA and district staff to purposefully discuss communication, timelines, new collections, definitions, and business rules. They can consider, for example, what the burden of a new data set might be and clarify whether what is being requested will meet the specified objectives. They have streamlined processes, eliminated redundancies, and ended collections that are no longer useful or relevant.

Working with the SEA

One of the most important things to emerge from OSPI formalizing their data governance was a more informative relationship between LEAs and the SEA. The state superintendent's office sends many of the data requests NSD receives. Working with the SEA to clarify and align data definitions, as well as to explain the impact of particular requests or collections on the LEAs, increases understanding on both sides.

NSD clarifies what particular data represent compared to the SEA's intent when they ask for a collection. For example, the LEA and SEA may not be in agreement about what a seemingly common term such as "absence" means in practice. How much of a period or day does a student have to miss before they are "absent?" Lack of common agreement leads to problems when the data are then being used to answer policy questions. Similarly, the SEA and LEAs may calculate exit dates from particular academic programs differently. If one agency uses end-of-school-year while another defines it as a student completing program objectives (which could carry over into a new school year), then data collected from the LEA may not accurately address the goals or intentions of the SEA. By developing clear data definitions and business rules, NSD better communicates these nuances to the SEA and ensures that data are used accurately.

NSD also communicates with the SEA about limitations of the data. Often, data requests or requirements from the SEA do not align with the LEA's business practices, or they put an undue burden on the LEA's data staff that is not balanced by the SEA's particular need. NSD has worked with the SEA to clarify data expectations and limitations. They try to determine the value of the question being asked and identify whether there are adequate data at the LEA level to answer it. Through establishing better and stronger data governance, they now have a vehicle with which to communicate about the practicalities of data collections and reports, and what can be reasonably implemented.

As a result of data governance, the LEA now has a much better idea of what the SEA is looking for when they request data, and the SEA has a better idea of what is possible. They can compromise and focus on what data can be accessed and used and whether the data are appropriate to answer specific policy questions.

These relationships allow larger LEAs like NSD to support the many smaller LEAs in the state, which have much more limited staff and mobility. In states like Washington, smaller LEAs often rely on larger LEAs to advocate on their behalf. NSD leaders urge agencies developing a data governance model to consider the smaller LEAs and think about ways to include their perspectives. Leaders cannot assume that all solutions or processes will automatically scale down.

After 15 years …

NSD has faced several challenges while developing its data governance program. A prominent challenge is ensuring that all stakeholders know the value of data governance and adhere to data governance regulations and processes. Though governance is defined in state statute, some state-level stakeholders ignore established processes, such as timelines for data requests, and there is little an LEA can do in response. Similarly, NSD has found that other groups can see data governance as onerous and try to circumvent the process; these may be researchers, advocacy groups, or other potential users of the data.

OSPI's data governance program helped improve communication around data and reduced data burdens. Establishing a data governance group that facilitates communication with stakeholders who request data (for example, SEA staff) has created a mechanism for problem solving and improved understanding. Additionally, OSPI has eliminated some data collections that were found to be duplicative. They have also retired particular elements for the same reasons. Overall, OSPI's data governance program has improved processes for both the SEA and LEAs, saving them time, improving their relationships, and minimizing the burden of state reporting.

Loudoun County, Virginia: Creating a Data Governance Structure

Loudoun County Public Schools (LCPS) initiated its data governance program through its Department of Digital Innovation as a cross-functional data team composed of members from each department in the LEA. It was launched in conjunction with the implementation of the LEA's data analytics and visualization tool. The data governance program grew out of a recognized need for a common language, an approved and vetted set of data, and the understanding that data quality requires that resolution practices must be defined, documented, and adhered to.

Members of the team were selected based on their experience with data science and represent all departments across the LEA–the team includes SMEs, statisticians, report writers, and analysts. They were identified by peers as SMEs or as skillful with data analysis and nominated by their department leadership teams. Thirty people were invited to a half-day data summit, where they discussed challenges without ever using the term "data governance." Over the next year the group met once a month physically, held biweekly "lunch and learn" sessions for technical assistance, and held several meetings virtually. Staff roles varied across the board and ranged from directors to support staff. They framed their work around the implementation of a visualization and analytics tool, provided training on the product, and embedded data management strategies into professional development and dashboard design. They implemented an inquiry-based approach of focusing questions on data and dilemmas that leaders (school and central office) faced. They aimed to deliver quick wins by publishing dashboards that were timely and meaningful to stakeholders, and then worked to modify them based on feedback.

The LEA's data governance approach is flat–they do not have committees or subcommittees. With the varied staff represented, the group approaches issues from multiple perspectives. They use a webpage creation tool to document processes and technical libraries and share the information with everyone on the team. This approach helps avoid delays and allows all members of the team equal authority. Because the LEA has had a number of high-level leadership changes, the team constantly communicates the data governance plan. Communication leads to greater understanding and more timely resolution of data needs and questions.

LCPS data leaders state that a deeper understanding of data elements has led to a greater proficiency in analysis skills. Offices report fewer instances where data consumers in the district need assistance with interpretation and analysis. Stakeholders can request more refined dashboards and their level of inquiry is at a deeper level. They have found that the practice of embedding data governance into the development cycle for any requests for data, analysis, or creation of visualizations has been the most effective practice, because these are now integrated instead of separate processes.

Solving a Definition Problem via Data Governance

Of all requests LCPS receives, the most frequent was for "enrollment data," however requestors were specifically asking for different things. Using the data dictionary created as part of the governance process, the team determined three different definitions of "enrollment data" to be used for different needs in the LEA:

- Enrollment data needed for internal budgeting. This is officially documented as internal fall membership data reports of enrollment by school, by grade, by program.
- Enrollment data needed for technology licensing requests. This is officially documented as real-time enrollment as of the date the license is purchased. This takes into account ongoing mobility of students within and outside of the district.
- Enrollment data needed for program staffing changes. This is officially documented as the projected spring membership and allows the district flexibility in staffing for the fall, which is historically lower than in the spring.

In Retrospect ...

Many in the district express gratitude for the data governance program and appreciate its clarity and transparency. The data governance team improved response time for data requests, and they have greater confidence in their data as the responses to stakeholders come from vetted data sets used for the right purpose. However, data leaders also note that fear of transparency and concerns of data privacy continue to be challenges. If a department "owns" data in their tracking system that the data governance team wants to access, they have not resolved the issues at the leadership level of how the information will be used and how the analysis of the data will be shared.

LCPS data leaders advise those creating and implementing a data governance program to approach governance from both the top down and the bottom up. Moreover, agencies embarking on this type of initiative should be aware that the work becomes embedded in the operational and strategic actions and requires agility and ongoing iterations.

Clayton County, Georgia: Establishing a Clear System for Data Requests

With more than 55,000 students, Clayton County Public Schools is the fifth-largest LEA in Georgia. Until recently, the LEA did not have a clear data governance process for managing data requests, whether from researchers or other interested parties. Therefore, when the current Coordinator of Student Information Systems joined the LEA in 2015, she collaborated with the Interim Director of the Research, Evaluation, Assessment, and Accountability Office to create a process whereby data requests are managed centrally and the LEA establishes memoranda of understanding (MOUs) for data sharing.

Requirements for Data Requests

Those requesting data are first directed to the LEA's website, which provides extensive information about seeking data from the LEA (https://www.clayton.k12.ga.us/departments/research_evaluation_assessment_and_accountability/conducting_research_in_c_c_p_s). The website includes information on a webinar that requestors must attend in order to submit a data sharing application.

Once an application for data sharing is submitted to the LEA, the data request is reviewed by Clayton County's nine-person research review board. The review board uses criteria established by the Department of Health and Human Services to evaluate requests, and considers issues such as whether the research references the LEA's name, and how the request will serve the LEA (approval to use LEA data requires a specific benefit to the LEA). The research review board meets three times a year, in the fall, winter, and spring. Requestors receive a determination within 30 days of the review board meeting. The schedule and timeline are posted on the website, so applicants are aware of appropriate times to submit and expected wait times for response.

If a request is approved, the requestor must complete an MOU that delineates the details of the data sharing agreement. Clayton County has a standard MOU that can be modified according to the request, and it includes a confidentiality agreement, establishes privacy requirements, and identifies exactly what information is required for the LEA to produce and share the data. It also includes requirements for data destruction. Once the Research, Evaluation, Assessment, and Accountability Office and the data requestor have both signed off on the MOU, it is shared with the IT team, who then communicate with the entity or vendor to ensure safe data transmission.

> Clayton County has established MOUs with other LEAs and Georgia State University to facilitate research as part of the Metro Atlanta Policy Lab for Education, or MAPLE (https://gpl.gsu.edu/metro-atlanta-policy-lab-for-education/, https://news.gsu.edu/2018/08/20/georgia-policy-labs-second-year-begins-with-new-staff-partnerships-and-research/). MAPLE does research that aggregates data from the different metro Atlanta school districts. MAPLE has a dedicated server for Clayton County data with a built-in data destruction code.

The review process greatly benefits the IT team. Because it is such a large LEA, Clayton County receives many data requests. Having the research review board evaluate requests significantly reduces the burden on the IT team, and ensures that Family Educational Rights and Privacy Act (FERPA) requirements are followed. The district also has a new Equity and Compliance department that ensures necessary data security. In addition, the focus on data privacy and data governance streamlines the data request process, even for in-house requests. For example, some requestors would try to circumvent established processes (deeming them too onerous) and request data directly from the SIS. These review processes prohibit this from happening.

Moving Forward

Clayton County continues to look at more innovative ways to transmit secure data and is also making technical progress to reduce man hours. The district is moving toward a big data framework, which will allow more work with predictive measures, making more of the team's work

proactive rather than reactive. They are also evaluating their current processes, to identify what is not working and find opportunities to collaborate with other agencies.

Putnam County, West Virginia: Working with the SEA to Improve Data Governance

Putnam County's current data governance program was created by the West Virginia Department of Education, working with a data governance committee made up of five county representatives and key stakeholders from various departments. The creation of the data governance program was a product of the state's federal SLDS grant, which has greatly improved the data quality and reporting processes for both the LEAs and the SEA.

Before implementing the data governance program, the LEA worked under a system that was great at collecting data but inflexible when it came to extracting or reporting out data. During collection periods, the LEA staff would submit data, which the state would check and return with any errors indicated. The LEA would fix these errors and resubmit the data, but because some of the data might have changed or updated after the first submission, new errors could occur. Depending on the severity of the error, the districts would occasionally need to submit multiple times. This process resulted in lengthy, extended reporting periods, which left the district unable to update particular areas of data. This meant that some data requirements could be delayed for both SEA and LEA deadlines.

With the SLDS and updated data reporting system, the SEA has now added real-time data edits, which are used nightly to check data submissions for errors and send a status report back to each LEA. This has significantly decreased burdens on LEA data staff, who can now check errors daily, fix them, and run reports. These improvements ready the LEA to submit data on an ongoing basis. The greatest result for all LEAs and the SEA combined is that data are more accurate and current at any time. In turn, this means that the data are a good source for decision-making.

Changing Perspectives on Data

West Virginia provided Putnam County and all LEAs in the state with software that allows LEAs to do their own data checks in addition to those provided by the SEA. This flexibility to identify and run data checks without having to request them from the SEA, which involves waiting for SEA approval and implementation, helps the LEA quickly fix data errors.

This improvement in data quality within the district helps stakeholders and has changed perspectives on data and their usefulness. Superintendents, principals, administrators, counselors, and others have greater trust in the accuracy of the data, they can now use the data in a more analytical way to inform their decisions, and they have a greater understanding of the benefits of the data. As the SEA looks to update their system, data loss is not a cause for concern; staff trusts that the data will be converted. Beyond district stakeholders, the SEA is now more confident in LEA data, and is therefore more willing to use them.

Leveraging Early Adopters

One way Putnam and other counties in the state increased the confidence of stakeholders in the data and in the data governance program was by asking for volunteers to work with the improved system to answer their questions and meet their needs. These early adopters then shared their positive experiences with colleagues, which increased buy-in for regular data engagement and use. The LEAs now find that most stakeholders support the data governance program because they see how the improved data systems have resulted in more accurate, timely, and useful data for all.