



VALUE ASSESSMENT OF A STATEWIDE STUDENT INFORMATION SYSTEM

Results and Recommendations

September 2019

Presented by:





1.0 EXECUTIVE SUMMARY	3
2.0 STUDY AND DATA GATHERING OVERVIEW	9
2.1 LEP CATEGORIES.....	9
2.2 ASSESSMENT COMMUNICATION PROTOCOL.....	10
2.3 LEP STUDENT INFORMATION SYSTEM (SIS) SURVEY METHODOLOGY	10
2.4 LEP FINANCIAL SURVEY METHODOLOGY.....	10
2.5 CROSS-STATE SURVEY METHODOLOGY	11
2.6 FOCUS GROUP METHODOLOGY AND APPROACH	11
2.7 RESULTS AND DATA ANALYSIS.....	12
2.8 LEP SIS SURVEY RESULTS	12
2.9 LEP FINANCIAL SURVEY RESULTS.....	15
2.10 CROSS-STATE SIS SURVEY RESULTS	18
2.11 INSIGHTS.....	19
3.0 NATIONAL STATEWIDE SIS OVERVIEW	19
3.1 BENEFITS OF STATEWIDE SIS IMPLEMENTATIONS.....	19
3.2 TRENDS AND THE NATIONAL LANDSCAPE.....	21
3.3 STATE SIZE AND GEOGRAPHY MATTERS	22
3.4 STAKEHOLDER ENGAGEMENT MAKES A DIFFERENCE.....	23
3.5 FLEXIBILITY IN APPROACH IS THE NORM	23
3.6 MANAGEMENT AND OVERSIGHT.....	23
3.7 FINANCIAL AND STRUCTURAL MODELS.....	24
3.8 CHALLENGES OF STATEWIDE SIS IMPLEMENTATIONS	25
4.0 DATA REPORTING PROCESS ANALYSIS AND RECOMMENDATIONS	29
4.1 OVERVIEW	29
4.2 FOCUS GROUP PROCESS	30
4.3 FOCUS GROUP FINDINGS	30
4.4 STUDENT OCTOBER DATA SUBMISSION PROCESS.....	31
4.5 LEP CATEGORICAL DIFFERENCES	32
4.6 DATA REPORTING PROCESS CHALLENGES	32
4.7 DATA REPORTING RECOMMENDATIONS.....	35
5.0 LEP AND CROSS-STATE FINANCIAL ANALYSIS AND RECOMMENDATIONS	36
5.1 TOTAL COST OF OWNERSHIP (TCO) COMMON FACTORS AND OPTIONS IN SIS PURCHASES	36
5.2 OTHER OPERATIONAL FACTORS INFLUENCING SIS INSTALLATION AND MIGRATION COSTS	39
5.3 POTENTIAL STATEWIDE FUNDING MODELS OVERVIEW.....	41
5.4 COLORADO CATEGORICAL LEP EXPENDITURE ANALYSIS AND INSIGHTS.....	42
5.5 LEP FINANCIAL AND OPERATIONAL CONCERNS	43
5.6 COLORADO LEP CATEGORICAL COMPARISONS AND INSIGHTS.....	44
5.7 NATIONAL STATEWIDE EXPENDITURE SUMMARIES AND INSIGHTS.....	46
5.8 STATEWIDE SUMMARY DATA AND EXPLANATION.....	47
5.9 STATEWIDE LEP FINANCIAL ANALYSIS AND RECOMMENDATIONS	51
6.0 COLORADO STATEWIDE SIS OPPORTUNITIES AND CHALLENGES	53
OVERVIEW	53
6.1 FINANCIAL SAVINGS AND FUNDING CHALLENGES	53
6.2 FUNCTIONAL USAGE AND LEP EQUITY.....	53



6.3 MAINTENANCE, SUPPORT AND LEVERAGING COMMONALITIES	53
6.4 CHANGE MANAGEMENT, RELEASE CONTROL AND SYSTEM STABILITY.....	54
6.5 DATA BURDEN AND BETTER SUPPORT	54
6.6 SYSTEM INTEGRATION CONSOLIDATION AND CUSTOMIZATION COLLABORATIONS.....	54
6.7 OPERATIONAL CONSISTENCY CHALLENGES AND COMPLEXITY REDUCTIONS	55
6.8 DATA QUALITY IMPROVEMENTS AND TIMELINESS OF DATA.....	55
6.9 OPPORTUNITIES AND CHALLENGES BY CATEGORY.....	56
7.0 STATEWIDE SIS POSSIBILITIES	58
7.1 POTENTIAL CDE STATEWIDE SIS STRATEGIES.....	58
Option 1 – Enhance, Upgrade and Automate Centralized CDE Data Pipeline Collection System (Status Quo).....	58
Option 2 – Centrally Procure, Fund, and Support Managed Transition to a Statewide SIS	59
Option 3 – Centrally Procure, Split-Fund, and Support LEP Consolidated SIS Options.....	59
Option 4 – “Procure Only” LEP SIS Vendor Purchase Options	59
Option 5 – Hybrid Model.....	60
8.0 FINAL THOUGHTS.....	61
8.1 ON-LINE SURVEYS	62
8.2 FOCUS GROUP PARTICIPANT COMMENTARY	62
8.3 PATH FORWARD.....	62
APPENDIX A – COLORADO LEP FOCUS GROUPS – SUMMARY LEP ATTENDANCE.....	64
APPENDIX B – COLORADO LEP FOCUS GROUPS - SUMMARY NOTES AND OBSERVATIONS	64
APPENDIX C – LEP FUNCTIONAL AND FINANCIAL SURVEY RESULTS	64
APPENDIX D – CROSS-STATE SURVEY RESULTS	64
APPENDIX E – CROSS-STATE SUMMARY OF STATEWIDE SIS EFFORTS	64

1.0 Executive Summary

Overview and Purpose

Late in 2018, the Colorado Department of Education (CDE) chartered this Value Assessment to assess Local Education Provider (LEP) data and financial burdens associated with required student data reporting and the primary tool used to accomplish that task: The Student Information System (SIS). This assessment provides an objective study of LEP impacts and provides information to help policy makers determine whether there is value in moving towards a standardized implementation of this software that provides common features, functions, and interfaces for all districts, Boards of Cooperative Education Services (BOCES) and charter organizations across the state.

CDE secured necessary funding to conduct the value assessment in 2017. The procurement was completed in the fall of 2018 and consultants with specific expertise in local and statewide student information systems conducted the value assessment project. It was made clear by the CDE project sponsor that there were no pre-conceived notions or agendas as to whether to move forward with the possible implementation of a statewide SIS. The value assessment was to be the first discussion of many in determining the viability of implementing a Statewide SIS in Colorado. The purpose of this statewide value assessment was to:

- Understand data burden associated with current state and federal reporting processes across LEP size and geographic categories
- Review and analyze LEP financial burden associated with student information system implementation
- Garner approach and financial information/experiences from other statewide student information system implementations
- Provide a set of objective statewide recommendations and potential next steps to the CDE

Data Gathering Methods and Approach

The survey and focus group data gathering occurred between January and May 2019 using two Education Data Advisory Committee (EDAC) approved surveys and seven (7) statewide LEP focus groups (both in-person and virtual). LEPs across the state were categorized based on geography and locale into one of three groups. Those stakeholder groups were brought together in several different ways to secure engagement of as many LEP and charter groups as possible with inclusion and transparency being primary CDE objectives. The sessions focused on three main areas with stakeholders: current data burden, financial alternatives, and opportunities/challenges in moving towards a statewide SIS.

Consultants also engaged in a similar manner with other state education departments who have considered or implemented a statewide SIS variation. Surveys, internet research, and structured interviews were used as the primary vehicles in data collection.

National Observations and Insights

Nearly half of the states have considered or implemented some version of a statewide SIS, standards-based data management, or a combination of approaches to improving statewide data collections and lowering district costs. Although there are broad commonalities in general approaches to state implementations, no two states have approached or solved the problem in exactly the same way. It should also be noted that not all states have decided to move in this direction for any variety of reasons.

There are many reasons for why some states have not moved toward a statewide SIS including legislative and governor policy, local control orientation, financial disposition, current infrastructure, State Education Agency (SEA) mission, and/or organizational management differences between states. It should be noted that there are states that struggled with the implementation of a statewide SIS. The source of those struggles varies and should be further investigated by Colorado in any subsequent steps toward a final decision on implementing a statewide SIS. Of those states that implemented a centralized/standardized collection or SIS strategy, some common themes emerged.

- Lower consolidated costs across the state for software, services, and support
- Better data quality because of more standardized SIS implementations of processes within software
- Fewer district managed integration points and/or reduced custom programmed interfaces because of commonalities in district software
- Less custom coded application solutions reducing LEP and SEA maintenance and support costs
- Equity across districts in terms of functional SIS modules available
- Better communications and governance across LEPs and SEA organizations in understanding requirements, collections, training, and general support

Approximately fifteen states and territories currently have implemented (or are implementing) some form of statewide SIS. Some have mandated these adoptions. Others have approached the alignment from an “opt-in” approach. Many have also taken several years to complete the project across a state. All have statewide governance processes in place to support better communication and transparency on collections, customizations, and changes that affect local agencies.

Although states moving towards a more centralized SIS architecture have had some challenges with their technical and process implementations, those that have had the smoothest transitions have good communications, executive support, and well-defined stakeholder expectations with their legislature, local districts, and communities. It has generally been considered a long-term “win-win” for the majority of states and territories that have moved in this direction.

Colorado LEP Observations and Insights

Colorado LEPs share similar statewide SIS concerns with other districts across the country. Challenges and issues predominantly come in the form of three discrete areas:

Technical – LEPs focused their technical issues surrounding existing investments in interfaces, migration, and enterprise connectivity challenges.

Operational – This area focused on issues related to internal operations and procedural challenges associated with a statewide SIS. Challenges noted included migration issues, re-training, support, internal process changes, CDE involvement/access to data, possible cross-district operational issues/timing, project management, and other items directly related to state/district operations in a statewide model.

Financial – Almost all LEPs expressed concern as to how this model would be funded and whether the legislature had the appetite for a statewide SIS in both initial and ongoing support costs. An overwhelming majority of districts believe a statewide system should be funded by

the legislature, but few believed that to be a realistic scenario. LEPs were also concerned about internal costs associated with the migration and change.

Statewide Opportunities and Challenges - As part of the focus group discussions, LEPs also discussed opportunities that a statewide SIS might provide. The majority agreed there were areas that could improve current state reporting processes by reducing iterative data validation cycles as well as by making functional improvements in the CDE data collection system (Data Pipeline) to aid in data quality and validation. There was also general interest in promoting better process/technical intrastate student transfers and student ID matching across the state. Finally, almost all LEPs believed there is opportunity for better LEP cross-system interoperability particularly with functionality, interfaces that would make the exchange of data much easier. Of particular note in this area was the interaction between the local SIS and statewide Special Education management system. These areas were viewed as long term cross-state collaborative opportunities that would be aided by strong statewide communications and governance processes.

Many of the same “opportunities” were also perceived to be “challenges” by focus group participants. Not all LEP’s believed there would be measurable cost savings, increased value to their LEP, improved vendor leverage, economies of scale, and improved functional collaborations between LEPs and the state. These comments centered on current opportunity costs in migrating from their current systems to a standard. However, groups also agreed that proper cross-state/vendor communications and realistic timelines that accommodate LEP specific issues would greatly improve the chances of success for a project of this magnitude.

LEP Financial Investments – Student Information Systems comprise part of the top-tier suite educational expense in enterprise administrative systems. Arguably, no one system impacts local school and district operations more completely than the SIS as it is typically at the hub of staff across all instructional and administrative groups. Along with Transportation, Nutritional Services, Special Education Management, General Financial and/or Human Resource Information System (HRIS) solutions, these systems form the foundation for LEP school operations. Accordingly, a good deal of local expense supports the SIS.

Focus groups and survey results showed a wide diversity in “per pupil costs” (PPC) for a SIS. This measure is a common mechanism for comparing total license and software costs across products in the educational ecosystem. Survey and anecdotal data showed that smaller rural districts pay a much higher per pupil cost than their larger counterparts. Similarly, statewide metrics show even larger savings for districts and states as the pupil pool increases, procurement economies of scale increase and LEPs garner annual cost savings from a statewide SIS implementation. Analysis shows the possibility of greater than 4 million dollars of annual savings to Colorado by moving in this direction, as well as providing a greater share of local dollars that support LEP instructional improvements rather than administrative expense. These figures do not include the cost of conversion or the cost for additional CDE or district support Full Time Equivalent resources (FTEs) to operationalize the migration or statewide support functions. However, it is likely some districts could gain a much more equitably priced, consistent, and functional SIS through the process with anticipated improvements/consistency in available district modules and supports.

Recommendations and Path Forward

Determining a possible future state for Colorado is an exercise in understanding available options, weighing alternatives, and managing priorities for state and district staff. Applications all have hard and soft costs, associated risks, and quantifiable benefits to the communities they service. Gaining a better understanding of these factors helps to address concerns, lower implementation risks, align efforts and leverage limited public funding with the goal of exacting a high return for the effort and monies deployed. The Value Assessment provided an initial opportunity to explore some components of the value proposition possible in a statewide model. However, there should be additional analysis and communication with more stakeholder groups to better understand requirements and feasibility before arriving at any final decision in approach, function, or form.

Part of a statewide SIS strategy would necessarily center on ongoing business and governance decisions around costs, support, aligned product licensing, educational community ownership, future systemic viability, and overall disposition of the product as part of a state suite of educational offerings. Finally, CDE operational and project funding would be required to implement any of the solutions. There are five general approaches to a statewide SIS although several states have used components from each to formulate their individual solutions:

- **Option 1 – Enhance, Upgrade and Automate Centralized CDE Data Pipeline Collection System (Status Quo)** - This is essentially a Colorado existing infrastructure “modernize and focus on interoperability approach” strategy. The current CDE data pipeline product is a mature software product that would likely require updates in technology and education data model standards based on current educational system improvements. CDE would look to improve its collection systems in improved automation, better validation and data quality checks, and improved/augmented functionality without impacting or touching existing LEP systems. An example could be to revisit implementing a data sharing process within Data Pipeline that allows the approving Local Education Agency (LEA) to move student “transcripts” between their organizations and ultimately to their respective SIS.
- **Option 2 – Centrally Procure, Fund, and Support Managed Transition to a Statewide SIS** – For those LEPs interested in moving to a centralized model, this was the preferred selection of many of the focus group participants. In this model, CDE would procure and provide the SIS platform for participating LEPs. CDE would jointly share facilitative and project management roles with individual LEPs over the procurement, timelines, delivery platform, common modules and common LEP/SEA customizations, as well as providing some level of common shared support services to districts.
- **Option 3 – Centrally Procure, Split-Fund, and Support LEP Consolidated SIS Options** - This model focuses on providing a compromise in funding and delivery of the SIS solution. In states where statewide funding is not available, some have opted to share costs with districts providing large cost savings in lowered per-pupil costs and then further incentivizing LEPs to adopt the platform with a split share of the software cost.
- **Option 4 – “Procure Only” LEP SIS Vendor Purchase Options** - In this approach, the SEA procures a statewide SIS, or some components associated with a statewide collection, providing

common pricing for all LEPs. It essentially acts as a purchasing proxy for the LEP and has been used in some states where funding is not available and locally maintained SIS installations are primary factors in a solution.

- **Option 5 – Hybrid Model** - CDE and LEPs might also entertain some combination of the above models and implementation strategies in formulating a long-term statewide solution.

One thing is clear in other statewide SIS implementations: *There are multiple ways to develop a solution and no two states have approached it in exactly the same way.* Clearly there is general LEP interest in investigating and exploring the statewide SIS concept further. This should not discount voiced concerns and issues expressed by some LEPs though. Projects of this magnitude often have stakeholders at different locations on an operational change scale. The following areas are noted as potentially Colorado value propositions in a statewide implementation:

- Reduction of data burden through cross LEP data sharing process optimization and better data quality
- Elimination of duplicate LEP interfaces and customizations
- Statewide functional equity in SIS modules
- Better transparency, data security and privacy management through statewide governance and role management
- Better overall statewide data management and standards alignment
- More standardized, consolidated, highly available, and secure operating platform
- Opportunities for better communication across the state, shared LEP and SEA collaboration, support, customization, and training
- Lowered LEP SIS costs per student (State level costs would increase in the areas of support and maintenance, offsetting some of the savings)

There will also be barriers to adoption of a more centralized model. The following areas represent key challenges for the Colorado educational ecosystem to address together and develop successful solutions in implementing a project of this type:

- Current SIS Vendor and or software bias
- Managing LEP Organizational Change and Approach
- Migration Costs and Transition timing (Recovering Investments in time)
- Managing Project Scope and Customizations
- Setting and Adhering to Realistic Project Timelines and Expectations
- Understanding LEP Requirements and Needs
- Securing Executive and Legislative Sponsorship
- Addressing Initial and Ongoing Project Funding
- Instituting a Culture of Collaborative Communication and Compromise

Ultimately, the final direction and options of this statewide product implementation will be based on strategic local and state objectives, fiscal priorities, and policy criteria as well as key decisions by local education providers supporting such a solution. The biggest impediments to the successful rollout of a statewide SIS will be the organizational change management (OCM) or change management, the

process of managing the change from the LEA's current SIS to the new Statewide SIS, and the LEA's ability to agree on a single SIS for the statewide implementation given their history and bias toward their own legacy SIS.

There was general interest among the assessment participants to continue the feasibility of implementing a statewide SIS in Colorado. This support should not be misconstrued as acceptance, as there are a number of additional organizational, operational, and governance issues to be addressed before a final decision could be made. The assessment team recommends that the following activities be pursued as a general path forward:

- Present the findings of this assessment to all LEP Superintendent's as they were not well represented during the stakeholder feedback process due to the defined focus of the assessment.
- Follow up with other states that have struggled with their respective statewide SIS implementations to fully understand their issues and how they would have done things differently.
- Review additional financial analysis of LEP's in each category to flush out total LEP costs associated with their SIS and migration costs in moving to a statewide SIS.
- Conduct further LEP data burden discussions with identified proponents of the statewide SIS to identify what specific data processes could change (reduce the burden) with the adoption of a statewide SIS.
- Thoroughly analyze and make recommendations on how a Statewide SIS can be selected by a group of LEP representatives without introducing any bias in the process.

Once these steps are complete, CDE will be well positioned to make a fully informed "go/no-go" decision on the implementation of a Statewide SIS. The balance of this report reviews potential opportunities and perceived stakeholder data to assist in the ongoing discussion of the potential value proposition presented by a Colorado statewide SIS implementation.

2.0 Study and Data Gathering Overview

The Colorado Department of Education (CDE) Vision and Mission centers on helping students achieve their education goals, graduate, be career ready, and ultimately become a productive citizen of Colorado. One of the ways that the CDE helps Local Education Provider's (LEPs) have more time to focus on their students is to help them reduce administrative burden associated with required Federal data reporting and tracking of student information.

To that end, CDE is considering implementing a Statewide Student Information System (SIS) to reduce the level of effort and financial burdens of individual LEPs. Because an implementation of this magnitude is a significant investment in time, work effort, and financial expense for the State of Colorado and its LEPs, the Department seeks to quantify the potential benefits and challenges of such a system prior to undertaking it. The results of this value assessment identify those LEP impacts (whether positive or negative) and provides information to help policy makers determine whether to move the effort forward. The CDE secured necessary funding to conduct the value assessment in 2017. The procurement was conducted in the fall of 2018 with an award to Wyant Data Systems (WDS), Inc. and its partner Student1.

WDS and Student1 staff supplied management and subject matter expertise supporting the value assessment project. The survey and focus group data gathering occurred between January and May 2019 using three targeted surveys and several Local Education Provider (LEP) focus groups. The purpose of this statewide value assessment was to:

- Understand data burden associated with current state and federal reporting processes across LEP size and geographic categories
- Review and analyze LEP financial burden associated with student information system implementation
- Garner approach and financial information/experiences from other statewide student information system implementations
- Provide a set of objective statewide recommendations to the CDE

The following sections provide an overview of the survey methodology and general findings.

2.1 LEP Categories

The Value Assessment was conducted to understand the differences in operations and orientation between districts based on geographic locale and local/regional perspective. For the purposes of the study, Local Education Providers (LEPs) were categorized as:

- Category 1 – LEPs in outlying towns or remote areas
- Category 2 – LEPs in urban-suburban or outlying cities
- Category 3 – LEPs in the Denver metro area

These categories also mapped to the student counts and sizes of the surveyed LEPs. The focus group sessions were relatively equal in participation from each group. There was not a major difference in general approach or opinions noted between Category 1 and 2 LEPs. There were however some differences between the same categories from LEP's who represented the Western Slope and those from the Front Range and Eastern Planes.

2.2 Assessment Communication Protocol

CDE management approved creation of a web page dedicated to the project as part of the project initiation activities. The page was commissioned early in January 2019 to support project activities and has been a primary vehicle for communication with stakeholders across the state. Content for the site and surveys followed existing CDE governance strategies with approval through the Educational Data Advisory Committee (EDAC). The website can be reached at the following URL:

<https://www.cde.state.co.us/studentinfosystem>.

Secondary communication mechanisms included follow-up via electronic mail with stakeholders as well as communication and updates provided to EDAC, LEP superintendents at SAC meetings, and CDE senior leadership. As part of the overall communication plan, there was correspondence with several LEP supporting agencies including Colorado Association of School Executives (CASE), Colorado Association of School Boards (CASB), regional Boards of Cooperative Educational Services (BOCES), and statewide CMOs.

In an effort to be as inclusive and engage as many LEPs as possible, the team also offered several additional opportunities for stakeholder engagement in virtual, phone, and one-on-one formats. While those results are not included in the online survey results, their input is reflected as part of the balance of the report analysis and recommendations.

2.3 LEP Student Information System (SIS) Survey Methodology

A statewide SIS functional survey was produced as part of this project to gather information in the following areas:

- Interest in participating in the planned in-person focus group sessions
- General SIS features and functions in use within the responding agency
- LEP demographics and SIS administrative contact information
- Rural, urban, and metropolitan LEP data reporting burden

The survey was created and administered through the Survey Monkey tool. Respondents were gathered voluntarily through website sign-up and participation. These respondents were also asked if they would participate in the face-to-face focus group sessions as part of the survey context.

Eighty-five (85) out of the two hundred plus (200+) agencies representing the three categories of LEP as well as a BOCES and charter schools responded over the two-week online entry window. To allow inclusive district participation, paper survey components were accepted after the official close of the survey. Although paper statistics are not considered in the online survey analysis, their commentary and opinions are captured as part of observations and report recommendations.

Complete survey results for each question can be found in the *Appendices*.

2.4 LEP Financial Survey Methodology

A similarly constructed and administered statewide survey solicited LEP information surrounding financial investments and cost of ownership of locally licensed and managed SIS installations. This survey focused on “total costs of ownership” and targeted LEP business managers in the following areas:

- Interest in participating in the in-person focus group sessions

- LEP demographics and financial contact information
- SIS licensing, installation and annual subscriptions
- Third party and custom SIS integrations
- On-premise and hosting costs
- Internal technical, administrative and operational personnel support

Forty-seven (47) out of the two hundred plus (200+) agencies representing the three LEP categories responded over the two-week online entry window. Although this response was not as high as the features survey, a good summary overview of financial information was gleaned for each group. Overall, there was a differential within and across LEP categories regarding financial investments in pupil accounting software, support personnel, customizations, and integrations.

Raw responses are provided as an attachment in *the Appendices*.

2.5 Cross-State Survey Methodology

A national survey was conducted to assess how other states view and/or use statewide SIS deployments. Forty-four (44) states were sent a similarly constructed and administered survey instrument that combined per-state function and cost data. The responses across the population were poor and only eight responses were received from the states – six of which were not using statewide SIS modalities for their delivery.

While the resultant data has been provided and integrated with additional information received, the majority of insights on the national landscape are garnered through prior team experience base, internet research, and direct conversations with education CIOs on the topic.

2.6 Focus Group Methodology and Approach

Focus groups were held at several geographically convenient sites across Colorado and categorized by LEP size metrics where possible. The intent was to engage as many LEPs, BOCES, and charters as possible in the statewide SIS value assessment discussion. In-person LEP attendance was good at each session with participant counts averaging about twenty people and ten plus districts and charter organizations attending across the state. Focus group sessions were held at:

- March 26th, 2019 – Fort Morgan District Support Center
- March 27th, 2019 – Pikes Peak BOCES Center
- March 28th, 2019 – Jefferson County Education Center
- April 11th and 12th, 2019 – Grand Junction Superintendent’s Meeting
- April 24th, 2019 – Cherry Creek Schools Administration building
- May 13th, 2019 – Ouray School District – No LEP’s attended
- May 27th, 2019 – Open Virtual Focus Group Meeting

Focus groups were structured to encourage active conversation. The sessions were divided logically to address three main topics: Data Collection Processes by LEP Category, Potential Financial and Adoption Models, and Statewide SIS Opportunities and Challenges. Where appropriate, facilitators provided context, insights, and supported discussions on statewide implementations in general and specific to Colorado LEPs. Focus group notes and observations are summarized and attached as *Appendix B* of this report.

2.7 Results and Data Analysis

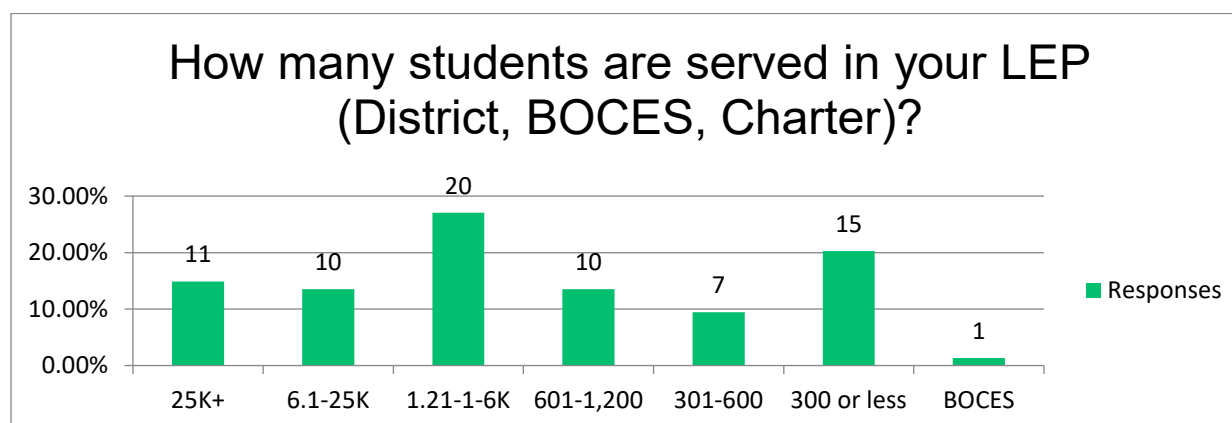
There was good Colorado statewide response to the surveys from all categories of respondents. Interest is high in this work and a large portion of survey respondents also attended one of the several in-person focus group sessions held across the state. Respondents expressed support in concept to explore the work further. This proved true from all categories. While this does not mean that *all* LEPs currently support the prospect of a standardized SIS and the local change that might engender, it showed there is alignment to investigate the work further. It should also be noted that among the LEPs that support the prospect of a statewide SIS, there is sensitivity that the planning, selection process, migration, implementation, training, and support activities need to address their LEP specific concerns. The topic of a selection of a specific SIS was purposely not discussed during the focus group meetings to address vendor bias and organizational change dynamics noted with a major system migration of this type.

Colorado LEP survey results show variability in cost and functional profiles across LEPs. It became apparent through the resulting data points that direct comparisons between districts are difficult as there are many LEP specific variables that can impact the total cost and features of a SIS implementation. While the data was useful to gain a functional snapshot and understanding of the current Colorado LEP SIS environment, it became clear much more discussion on requirements, features, and use cases is advised if the CDE is to pursue the work beyond this initial value assessment.

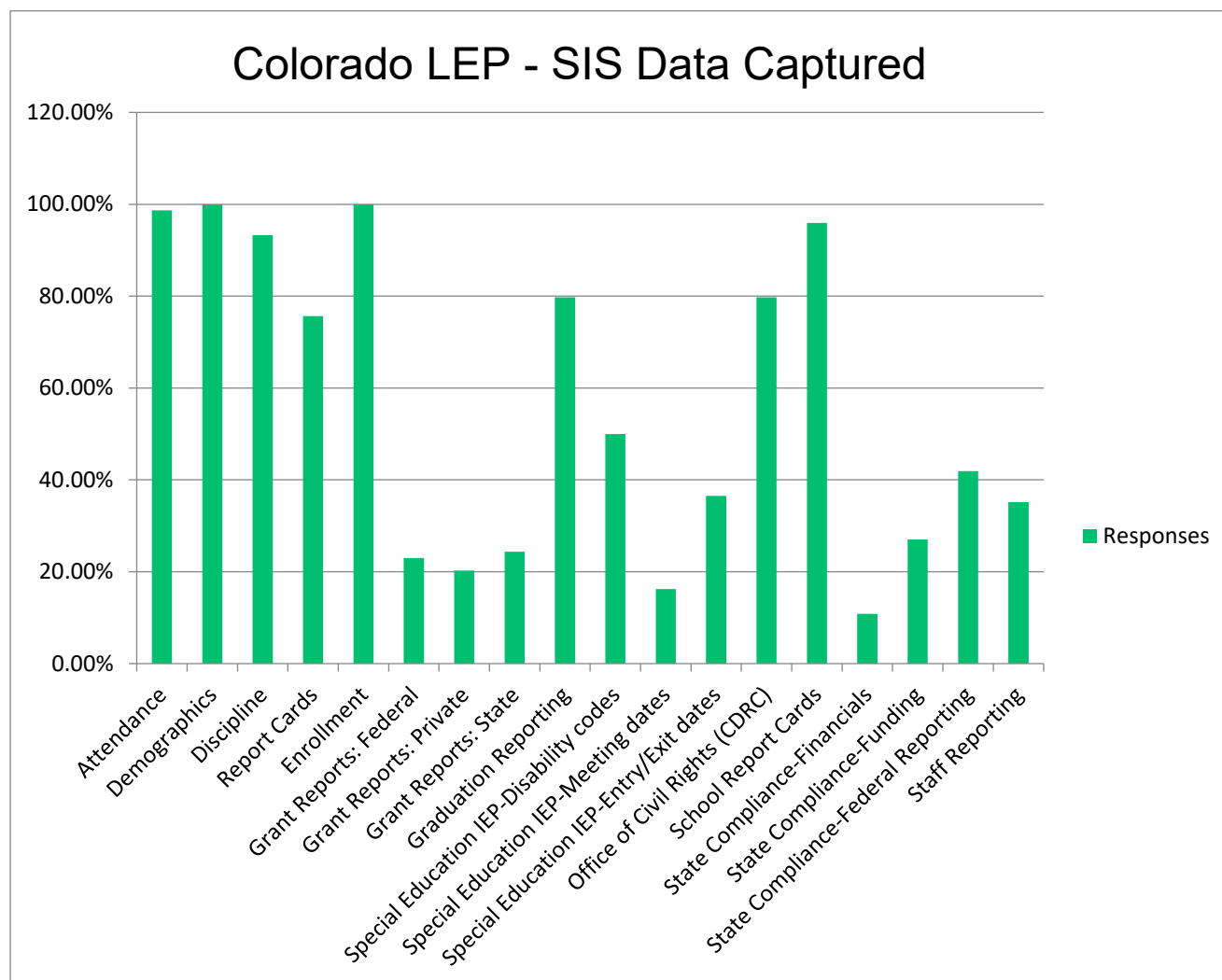
Team members followed up directly with several states and territory agencies as well as research on statewide implementations. This yielded far better information than the survey instrument. Several common anecdotal themes were drawn out across the state implementations including proper messaging and communications, financial savings to state and district, operational alignment, reduced data burden, and improved local district customer satisfaction in properly implemented systems.

2.8 LEP SIS Survey Results

Eighty-five (85) out of two hundred plus (200+) agencies responded to the LEP SIS Survey. This survey had the highest participation rate of three instruments delivered as part of the value assessment. The result is not surprising given this was the most functional of the surveys eliciting a pupil accounting users, information systems, and data manager respondents. All three categories of respondents were represented in survey results with a larger propensity of results from rural LEP organizations. The figure below illustrates participation results:



There is a wide disparity in the type and amount of data captured in LEP SIS instances indicating there are likely other state based, 3rd party vendor, or district custom-coded systems currently used to support various district functions. There are, however, some universal commonalities particularly in attendance, demographics, mark (grade) reporting, discipline and enrollment data. Additionally, approximately 80% of respondents store some type of longitudinal test data in their SIS i.e. assessment scores across grade levels.

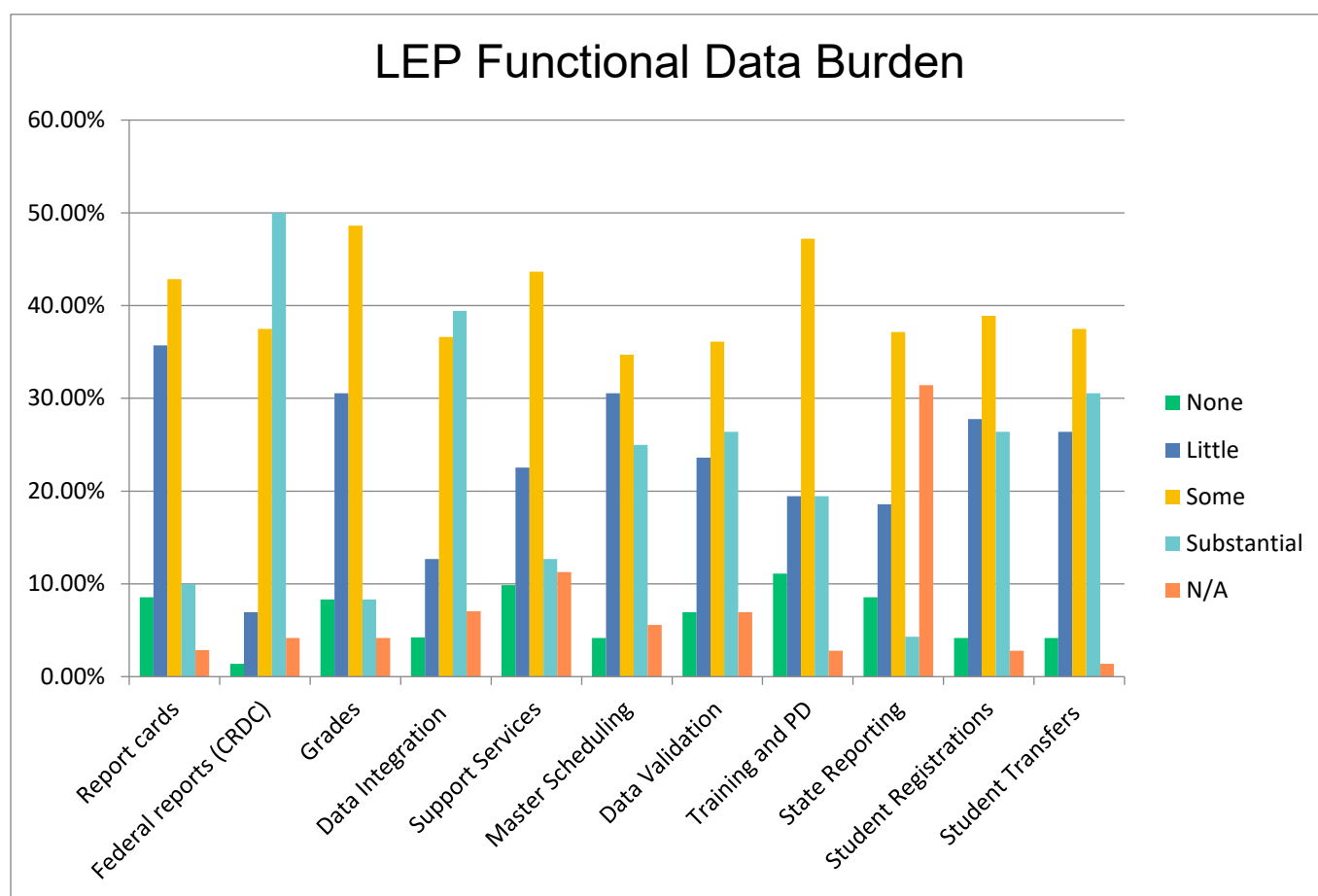


A potential value add to districts would be a reduction in the number of third-party applications and related integrations necessary with a more complete integrated SIS implementation. This ties closely to data quality and tools used to verify information prior to submission to external sources like the CDE Pipeline. Fewer than 35% of respondents use business rule/validation/quality assurance software to help manage their submissions indicating a higher degree of manual human intervention to manage their LEP data submissions. Some districts were able to afford third party data validation tools or have staff that wrote validation routines for their data.

More than 60 percent of LEP survey respondents note their SIS installations are hosted and cloud based. This follows a national trend towards cloud-hosted enterprise software installations (whether state

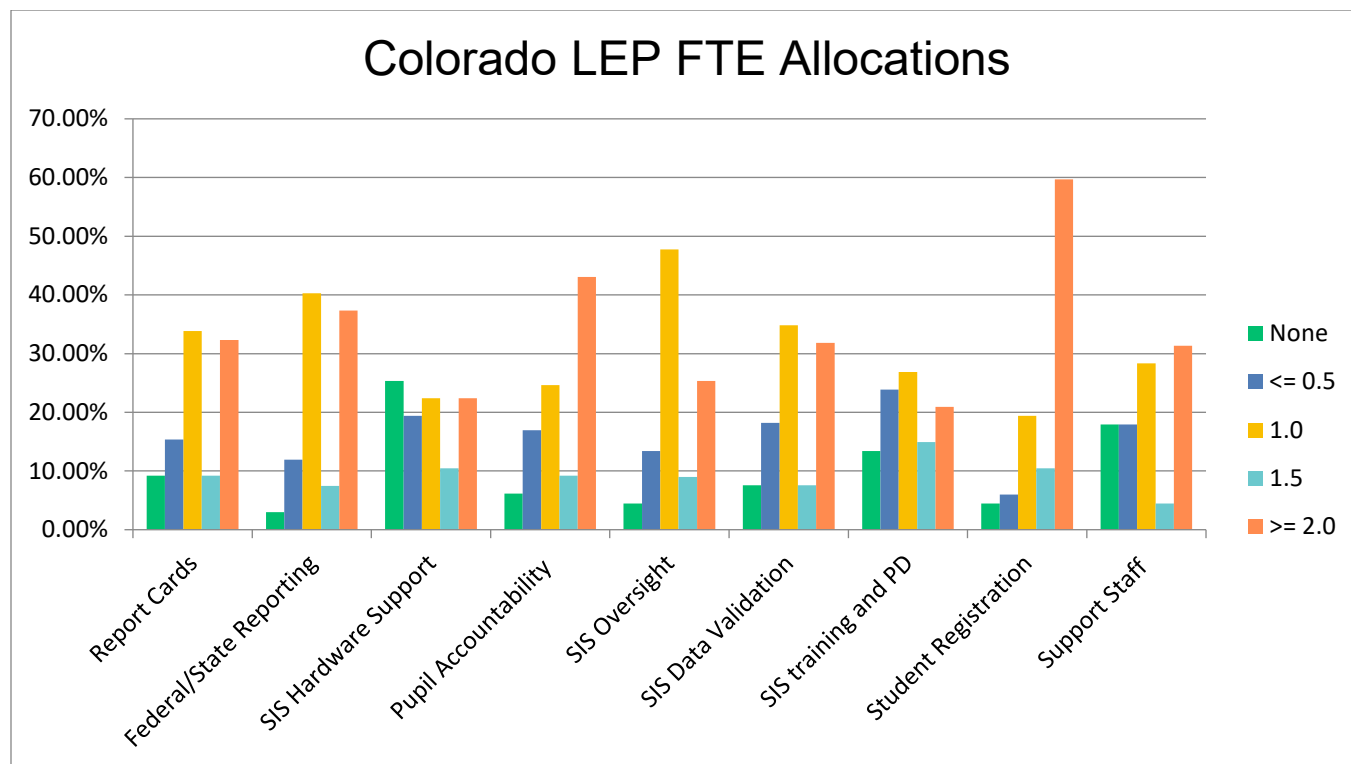
private cloud hosted, or vendor sponsored). Ownership and maintenance costs are generally higher in on premise installations and also more expensive from a human/fixed capital support perspective requiring facility, equipment, personnel, and additional security to support the onsite installation. However, the decision to host on premise or in the cloud is ultimately a local choice based on a number of factors including technical competency, district infrastructure, and operational concerns. Other states often have a combination of hybrid cloud and on-premise implementations based on local decisions.

Data burden varies across functional areas with the three highest categories being federal and state reporting, data integration, and student transfers. Data verification, registration, and scheduling were also annotated with a substantial amount of required people resource burden. This data was reinforced in the in-person focus group conversations with each LEP category. The following chart summarizes this information:



Personnel support for SIS varies based on district size. Not surprisingly, smaller districts consolidate operations while larger districts are more apt to divide responsibilities based on functional or technical area. The majority of LEPs have at least one person dedicated to supporting their SIS. Larger districts have multiple personnel with the largest LEPs having entire departments dedicated to support for pupil

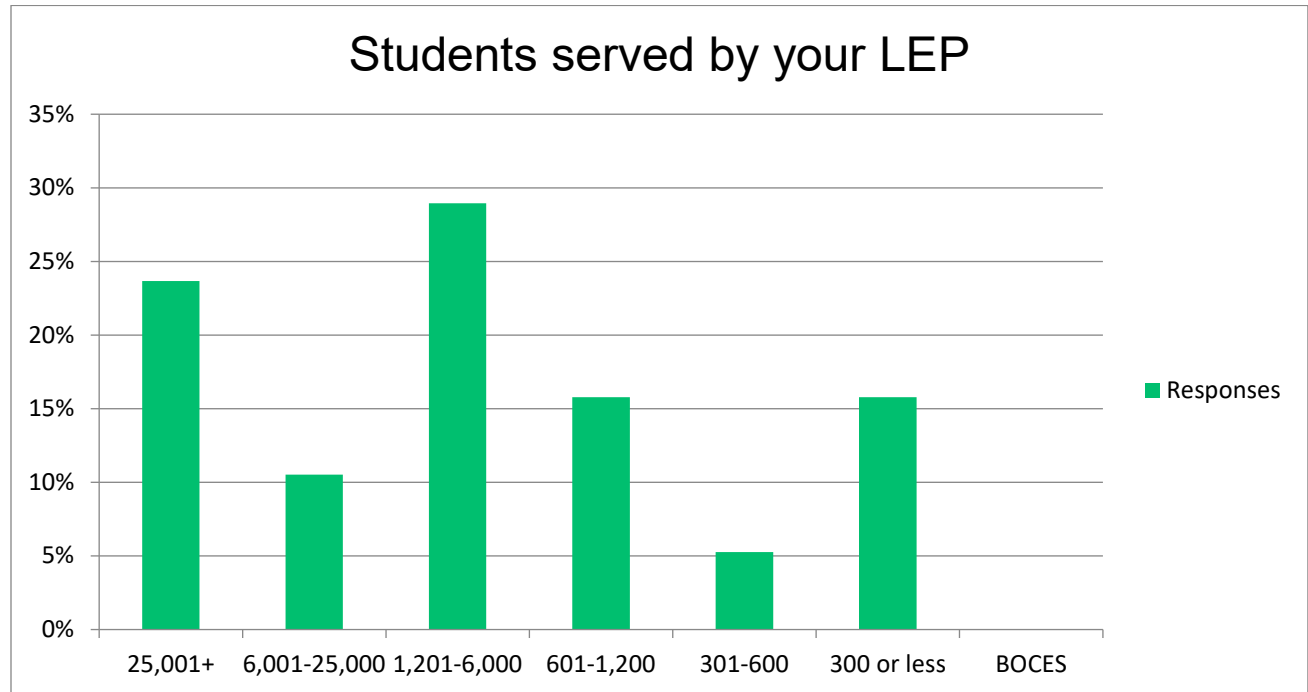
accounting/information systems for their district and schools. The chart below illustrates how resources are allocated across the sample pool:



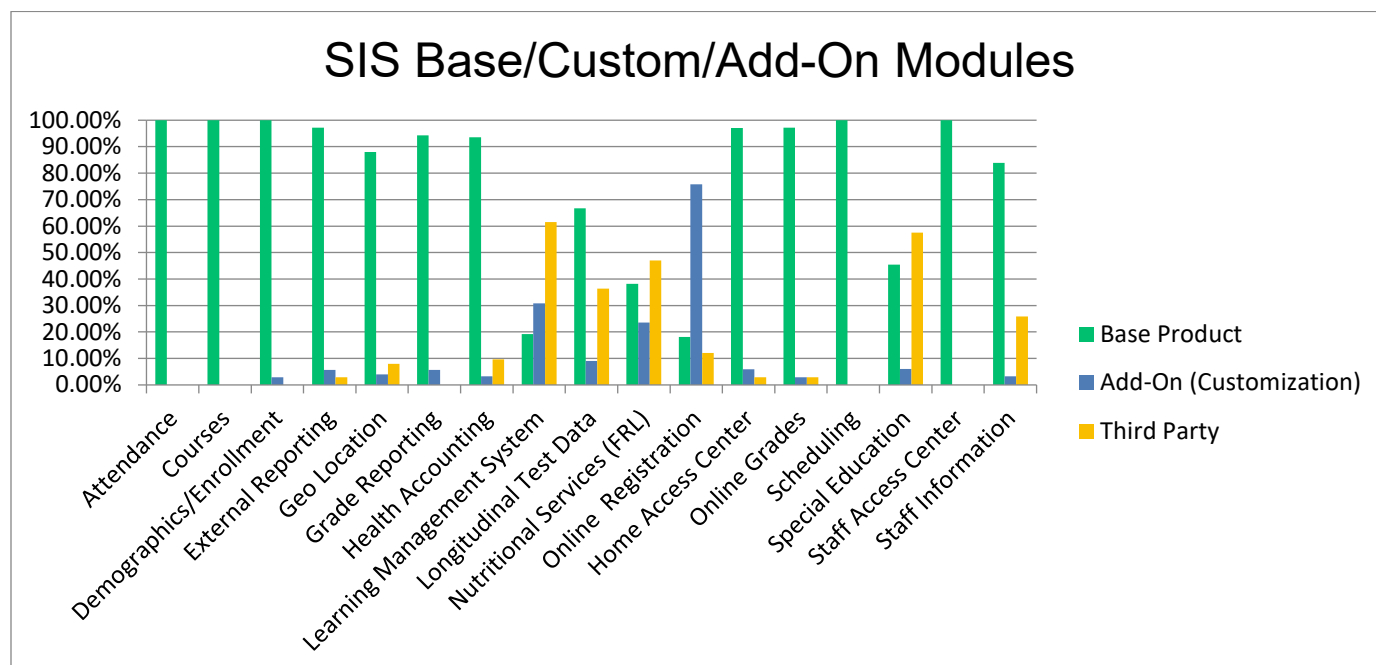
Overall, there is a substantial personnel effort applied across all categories of LEP in support of their SIS and associated data related tasks. Student registration, accountability, and data quality all consume a significant amount of human capital and time. Although a statewide SIS may reduce some FTE burden through process consistency and better data quality, this chart shows a foundational amount of LEP support for technology systems needed across districts from governance, administration, and support perspectives. Those components are likely to remain constant or benefit from a redistribution of effort and better anticipated source data quality in a statewide effort.

2.9 LEP Financial Survey Results

A total of forty-seven (47) out of the two hundred plus (200+) LEPs statewide responded to the LEP Financial Survey. Several questions were duplicated between this and the LEP SIS Survey as a mechanism to validate LEP results and measure alignment between business managers and support personnel. This analysis only annotates different areas assessed or deviation in results between the two internal state survey instruments.

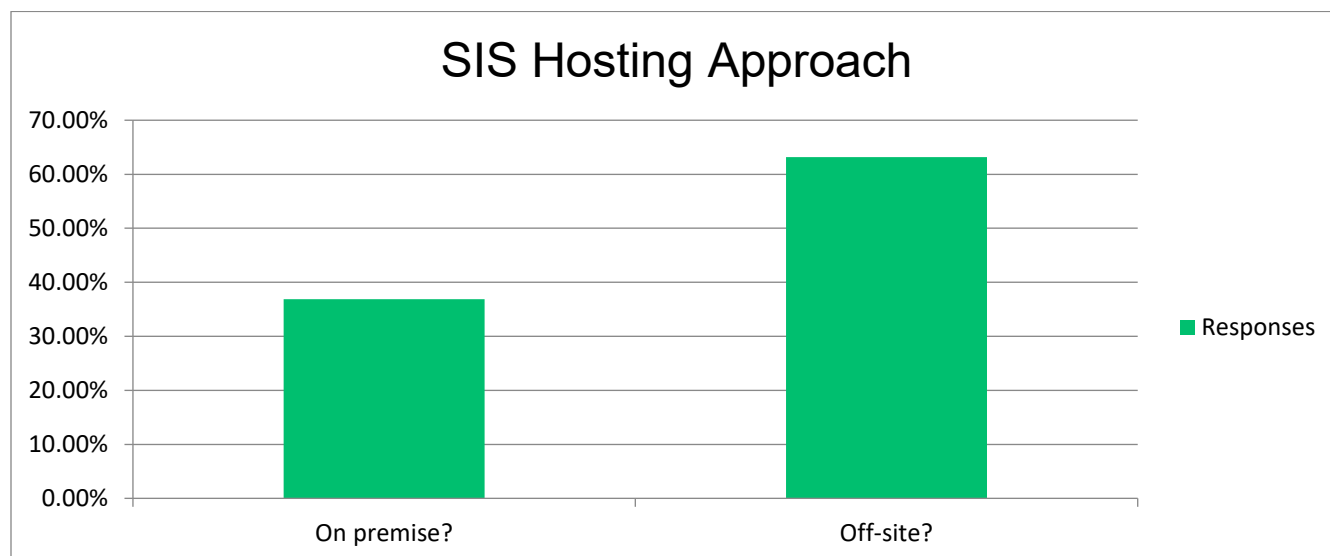


The response profile for the financial survey showed a heavier response from Category 1 rural districts. Not surprisingly, the reported variance in SIS costs are substantial between the various categories of responding LEPs. Variances are caused by overall bid cost, size, modules purchased, amount of training, and a host of other related variables that influence the total per pupil costs. These costs may or may not include surrounding services (hosting, customizations, service levels, integrations, etc....) since there is no consistent procurement approach for requirements between the various LEPs that participated in the survey.



As illustrated in the graph, there are some common components that are 100% utilized by LEPs (e.g. Demographics, Registration, and Scheduling) but there are also several pupil accounting modules that are either customized or purchased by LEPs outside of the base SIS software (e.g. Special Education, Online Registration). These custom modules force additional point to point interfaces and have a higher total cost of ownership than SIS-integrated modular solutions. Finally, some LEPs report management of staff in lieu of a human resources system (30+% of respondents) and school choice data (60+% of respondents) within their SIS deployments. This signals a general trend toward more centralized and consolidated use of the SIS for multiple organizational management functions.

Reported costs range between \$2,500 for smaller districts and \$600,000 for some of the larger installations. Likewise, reported per pupil costs (PPC) range widely with smaller districts bearing a much higher per pupil costs (PPC) cost than their larger counterparts. Reported costs ranged between 5.00 and 20.00 per student per year – a wide disparity and much larger variance in discretionary fund use.



In terms of infrastructure approach, over 60% of districts who responded have moved to off-site hosted and potentially cloud-based solutions for their SIS infrastructure as shown above. This follows a general national trend in cloud-based deployment solutions for major pieces of productivity software and technical infrastructure in both public and private sectors. Ultimately, on premise and cloud computing decisions are based on a number of local technical, policy, and administrative factors.

Personnel resources deployed against SIS operations varies widely in scope and approach based on size of the LEP. Smaller LEPs are likely to have a single FTE (full time equivalent) focused on SIS administration as well as sharing several other job functions. Larger districts are far more likely to dedicate resources against granular segment responsibilities based on function (e.g. technical support, data management, analytics) with one respondent indicating greater than 20 FTEs dedicated to supporting their LEP pupil accounting functions. These disparities in LEP staffing often result in variations in service level and support provided to instructional and administrative SIS functions ultimately impacting effective usage, training, administrative, data quality, and general staff supports.

2.10 Cross-state SIS Survey Results

Of the cross-state national survey results of respondents, only 1 current state-wide deployment (Nevada) provided information via the instrument. The majority of respondents skipped many questions that did not apply to their particular implementation.

Nevada is generally considered a local-control state but recently implemented a statewide SIS. Their approach to funding supported a statewide purchased/managed module for collections and a common procurement for districts to purchase their individual SIS installations. The state provides common screen customizations and support for the statewide installation. They also indicate they have lower statewide costs, better communications and governance, and better cross-district/state working relationships. Overall, the effort has yielded a positive operational change for the state.

Other states who responded either have no statewide deployment, decided against a statewide SIS effort due to political or policy issues, or maintain district-based SIS working groups but decentralized LEP SIS deployments. Numbers of statewide SIS vendors operating within the states range from between 1 and 20. Some states have opted to use data standards (Ed-Fi, SIF, CEDS, and IMS-Global

were mentioned) as a mechanism of vendor/data/interoperability standardization. One state respondent believes a statewide SIS to be a “lose-lose” situation citing any problem becomes a SEA issue, sustainability and funding are problematic, and a lack of local choice as their primary reason for non-adoption.

The report insights provided come from direct consultant interviews, internet research, individual email and phone contacts, and experiential insights into statewide deployments across the states and US territories.

2.11 Insights

Survey results provided validation of information, concerns and benefits found in the LEP focus group sessions. There are common themes between Colorado LEPs and other statewide implementations from benefit as well as issue perspectives. The most common benefits annotated by SEAs included:

- Lowered costs
- Better interfaces and overall tools for data quality
- Improved training and support across and within districts
- Expanded/more consistent SIS functions and modules available to statewide community
- Better/more aligned state reporting components

Common challenges noted by State Education Agencies (SEAs) included:

- Voiced concerns over the potential loss of local control
- Uncertain support and sustainability components
- Migration/Implementation costs
- Vendor lock-in
- District specific integrations and customizations
- Timing and recovery of current local investments

These nationwide state implementation themes are similar regardless of legislative mandate, implementation approach, or size. Other state comments stress the importance of proper expectation management, regular communications, and a focus on organized SEA and cross-district governance efforts as critical success factors in implementation. Ultimately, most successful implementations require organizations to work together, agree to negotiate on timelines, features, and most importantly processes and data. The more aligned the expectations, processes, and data are, the more successful the final product.

3.0 National Statewide SIS Overview

Statewide SIS deployments vary greatly between implementations as do the drivers and policies that support the idea of a more unified and managed delivery strategy for administrative systems. This section takes a look across the United States at statewide SIS deployments, noted trends, financial models, and supporting benefits and challenges of the approach.

3.1 Benefits of Statewide SIS Implementations

The value determination to move to a statewide SIS is usually defined by a number of common factors and benefits. These broadly fall into the following categories:

District and State Cost Savings – SIS systems are one of the costliest administrative systems a district procures. Helping districts manage their cost of ownership and leveraging state size often is cited by CIOs as a primary reason for pursuing statewide SIS deployments.

Improved Data Quality and Standardization – Source system standards for data entry, common approaches and data structures, and general statewide standards around data classification help to align and improve data quality for all producers and consumers in the pupil accounting ecosystem. A single SIS deployment helps baseline and normalize better alignment of district operations.

Reduced Reporting Burden – District compliance structures for state and federal reporting are regularly cited as opportunities for a statewide improvement in process and procedures. One approach to helping mitigate this burden is through a statewide SIS deployment where common data collection screens, elements, and various automated processes (rules, validation routines, collections, data acquisition etc.....) can be more easily implemented through a common and consistent underlying technology platform. In Colorado, this could be facilitated through functional improvements and modernization to the existing CDE Data Pipeline LEP Data Collection system and standardized integration/interoperability between applications.

Economies of Scale in Infrastructure, Integration, Support and Training – All information systems require a certain level of personnel to support operations. There are economies of scale in almost all facets of operation noted particularly in common configuration, statewide customization, and common third-party software integration. Also noted were better and more unified data support, communication, and governance structures by states that have implemented statewide platforms. The impacts are often aligned with lowered operational and support costs for districts that can better leverage intermediary or state offered support and technical structures.

Improved Customer Satisfaction – Focusing on delivering value added customer services to districts as well as their traditional roles in compliance management is another area where states benefited from a statewide SIS. A properly implemented statewide SIS or unified architecture typically yields a win-win for all concerned although CIOs mentioned it is always a multi-year process and a very large endeavor for their districts and the state. This quickly becomes an organizational change management issue for the project that needs to be managed closely through the life of the project. The improved customer satisfaction is only possible if the LEA's understand the changes required and are onboard with the improvements the system provide to their respective LEA.

Some states have completely centralized and aligned their district/charter software deployments far beyond a SIS to include many other systems like human capital, financial, and instructional software categories. Others have focused on statewide SIS-only deployments improving data quality through more unified, standardized and automated collection mechanisms. Still others provide the opportunity for districts and charters to purchase a SIS using leveraged state pricing but do not formally provide support (financial or otherwise) for the district's decision. Funding is also an area that produces several different creative options and choices to support the effort.

All that said, there are can be many drivers for states to not adopt a statewide SIS solution – and there is still a large population of states who have currently declined to move in this direction or consider this option. Commonly mentioned reasons for non-adoption include:

- Maintaining district local control
- Legislative policy change
- Insufficient legislative and ongoing funding support
- Services are outside the agency goals, mission, charter, and objectives
- SEA staffing insufficient in the current organization to support the additional responsibility of taking on a statewide deployment

Ultimately, the decision to move in a more centrally managed direction is most commonly shared among the legislature, SEA, and locally controlled education agencies. It is both a policy and practice change for many states. The decision and implementation usually evolve over time. It is not uncommon for several years to elapse from the idea's inception to build consensus, compromise, and accommodate all the stakeholders in a state. There is no one system that impacts district operations, students, teachers, and parents more than a SIS. Consequently, there are many different approaches and variations states have taken to meet their unique needs in this area.

3.2 Trends and the National Landscape

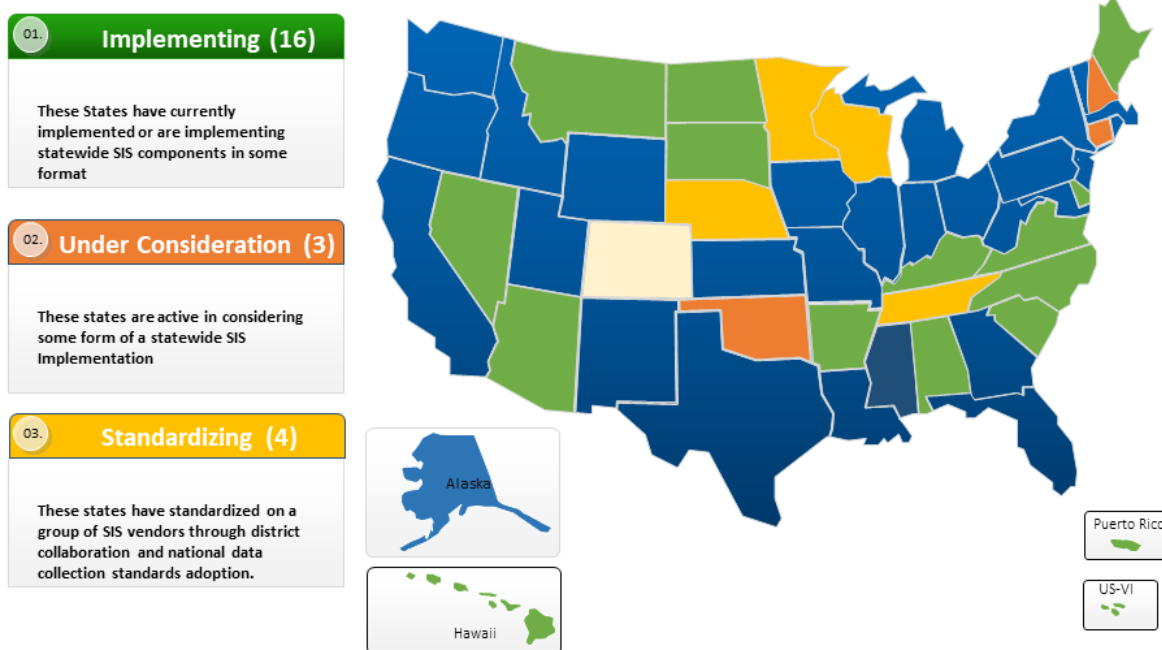
There is a national trend towards system centralization both in business and the public sector. Consolidation of IT systems and services is not a new concept in the business community and has been practiced in all disciplines particularly when implementing quality management, business merger, and organizational consolidations. It is logical that these efforts would yield better operational efficiency, cost savings, data quality, and procedural alignment when implemented properly.

The public sector across the country has also been moving in this direction as can be seen in efforts to centralize information systems operations under Statewide Information Systems Departments (State Central IT Departments). These departments are actively assuming and consolidating individual agency application portfolios and supplemental services/support as part of their attempts to lower costs and centralize operations. Educational agencies have generally been slower in adopting this trend as they are larger, more geographically diverse, with more complex agency servicing regulations, stakeholders, requirements and funding streams. In Colorado the centralized efforts have not been effective for education as the information technology group is tightly coupled with the agency's divisions supporting the LEA's.

Given flat and reduced state budgets, legislators are focused on providing more with less and tend to fund in block grant versus statutory operational funds. SEAs are gradually moving from "compliance only" organizations to a more supportive, service-based orientation for their stakeholders. Finally, districts typically welcome any type of reduction in administrative overhead and cost structure that allows more money to flow directly into the classroom. All these components point to SEAs moving in ways to better operationalize their organizations and manage costs and level of service profiles. A statewide SIS implementation is one way to help meet these requirements when properly structured and implemented.

The following graphic depicts current consolidation and standardization efforts of state education agencies across the country. The attached Appendix E provides brief summary of statewide efforts and approaches. It is noteworthy to observe the many different approaches states take towards achieving this goal. Whether traditionally locally controlled or not, almost half of the states have or are actively working towards some degree of consolidation, standardization, and/or alignment in systems.

Statewide SIS Implementations – National Context



4/26/2019

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3.3 State Size and Geography Matters

Typically, smaller and more rural states and US Territories adopt Statewide SIS implementations before larger more populated geographies. For instance, Hawaii, US Virgin Islands, Puerto Rico, and Delaware are all state/territory wide implementations. Hawaii, Puerto Rico and the US Virgin Islands have a single district. Delaware's implementation includes nineteen school districts and forty CMOs statewide. In these cases, it is both easier to gain a level of consensus when migrating a smaller number of agencies and requires less elapsed time to do so. This follows implementations within rural states like Montana, North Dakota, and South Dakota where there is a larger geographic area but a smaller overall population of districts, schools, and students. Even in these states, where population is concentrated and larger districts exist, these agencies often migrate far later in the process.

Smaller, rural districts often have a higher relative cost profile for software acquisition, usually have less resources to support their infrastructure, and often reap larger overall benefit from the economies provided within a statewide solution. They typically garner more direct and immediate benefit from collaborative efforts and shared services, as well as providing the highest return for their districts in terms of lowered operational and personnel costs, increased functionality, and better system integration. Larger districts typically have greater resources available to support their management,

administration, and technology components. However, they often also customize their installations and interfaces making transitions more costly and involved from data, integration and process alignment perspectives. They also have more investment in user training and support for students and their families that must be considered when evaluating the total cost of ownership. This is often why they migrate later in the process.

3.4 Stakeholder Engagement Makes a Difference

When SEAs take on a Statewide SIS or consolidation project, they most often act to *facilitate, manage, and support* it on a timeline that minimizes impacts, disruptions, and aligns with each district's migration timeline. The most successful of these efforts define clear expectations across all the project participant classes and always show a strong cross-agency and school executive sponsorship that supports the work. This is done within a framework of regular communications between state resources and district user bases.

Migrations typically focus a piece of transition on technical components as these are the most concrete and visible changes to operations. However, the vast majority of long-term benefit are almost always found in process improvements, business process alignment, and data standardization. *Effectively managing these components requires LEP and SEA organizations to align process and procedure and at times compromise/negotiate as part of the project.* This work is generally coordinated across administrative and academic functions with strong executive support from both SEA and LEP management.

3.5 Flexibility in Approach is the Norm

One thing is clear in these types of efforts: *There is no one method used universally to accomplish SIS consolidation.* Although the general tenets of reduced burden, cost savings, data quality, and operational efficiency are communicated as national drivers, how states and local agencies accomplish those objectives varies greatly. This is a function of many different state-specific variables (state policy, local view, size, geography, finance, technical capability, operational resources etc....) that cause tactical approaches to differ dramatically. It is, however, important to note that not all states are moving in this direction for many other reasons having little to do with technology or information systems.

3.6 Management and Oversight

Many statewide implementations are not mandated by the SEA or legislature – they are managed through SEA and LEP collaborative efforts over time. There are some mandated exceptions to this rule as in the State of Kentucky where the Kentucky Department of Education is legislatively mandated to manage all technology and services for its districts. Additional states that have legislated a single SIS include North Carolina, South Carolina, South Dakota, and North Dakota. In Kentucky's case, the legislative focus was on equity across schools, not a particular piece of software. Others mandate the change as a way of assuring volume pricing and district adoption.

Other statewide implementations are at the choice of the district and charters and usually have a combination of incentivized financial, process, and procedural benefits that help drive their decision. Some states use working groups, committees, task forces, and/or a memoranda of understanding (MOU) to memorialize and orchestrate these agreements. Whatever vehicle is used, the most important management concern surrounds setting realistic expectations and managing the necessary changes in process, technology, procedure, and protocol for the project to succeed.

The technical act of migrating a SIS is a fairly well understood set of activities and tasks. *Managing organizational and process changes for a project of this magnitude at the state and local levels are entirely different matters.* The most successful efforts embed a review/update of current local processes, good governance, and regular communication practices within the migration project plan and provide substantive ongoing training, technical services, and personnel support for the transition.

3.7 Financial and Structural Models

Several general financial models have been used within states to fund and support statewide SIS deployments. As in the deployment models previously discussed, there is variability in how states and districts creatively approach funding. There is however some general similarity in approach. Typically, there are two major phases to these enterprise wide projects: A) The initial implementation, and B) Ongoing Operations and Support. There are usually high initial one-time costs to migrate, convert, and deploy the solution and lowered managed operational costs for LEP's over time. Cost savings occur over time and through district economies of scale. Most commonly from a funding perspective, the first phase is treated as a fixed project and the second phase is treated as ongoing operational expense. States fund these efforts differently depending on a number of specific environmental factors. To best understand the financial models employed, it is helpful to understand what funding is typically available at state and local levels.

Federal Funds – Available to states and local agencies, these funds typically come in the form of one-time grant or “title based” annual federal funding formulas and components. They have strict expenditure rules and are generally the most limited in what the funding can be used for. Most commonly, states use federal grants for large portions of initial development. A good example of this would be data standardization and state longitudinal data systems (SLDS) efforts through Race to the Top Grant funding streams. Local agencies often benefit from statewide grants as well with distributions made to them for specific projects and proposals.

State Funds – Available to state and local agencies, these funds can be issued through a grant or are statutory in nature. They are typically used for ongoing operational and discretionary expenses at the state and local levels. It is here that ongoing maintenance funding is typically requested and approved through state legislatures. State funds are often “matched” with local funds to create a larger pool of available money for resources. The most common example of matching is in teacher salary where a portion of payroll and benefits comes from statutorily allocated state funds, and the balance of funding is provided locally.

Local Funds – Available only to the local district, these are raised via referendum, bond, or other local tax measure as a tax to support the school district. These funds are generally expended against operational and discretionary items. Many school districts spend all local funds against their information systems expense as there is often no statutory match of state funds to supplement local expense. This usually has the effect of removing money from other key operational areas – including instructional resources and teachers.

States and districts have some latitude on how to spend these resources depending on statute, grant, and approach. States and local districts typically take one of four approaches in terms of funding their statewide SIS efforts:

State Procured and Paid – In this model, the legislature typically appropriates funds to the SEA supporting the statewide SIS effort. This usually includes some level of maintenance, help desk, and support structure beyond the cost of the software. The appropriation generally results in a statewide procurement using volume pricing to lower overall state and district expenses associated with the project. The volume nature of the pricing usually allows a state to better negotiate additional modules and state customizations necessary for reporting. North Carolina, Delaware, North Dakota and Kentucky are examples of this style of funding implementation.

State Procured/Districts Split Costs – In this model, states procure and pay for a portion of the expense splitting costs with local districts. Districts are able to capture saving by lowering their costs of ownership and states have the option to better negotiate modules, features, and customizations supporting statewide services and data acquisition. This model is particularly attractive when additional operational funding is not available at the SEA level. Delaware is an example where the state negotiated a statewide contract for its learning management system and worked with districts to procure a system that worked for all stakeholders. District splits are usually paid out of a combination of state, local, and federal funds.

State Negotiated/District Paid – In this model, the state procures on behalf of all districts, leveraging volume pricing, but does not purchase the district software. Districts receive the benefits of lowered pricing and support costs but are responsible for the investment in the SIS themselves. In this model, the state will often purchase a state module and perhaps some of the customizations necessary for statewide deployment and data acquisition but does not participate in funding the local district portion of the software. Nevada is an example where this model has been successfully implemented.

Other Funding Models – Even where a SEA does not formally support a statewide SIS, some consolidation often occurs through local district collaboratives and intermediaries. It is not unusual for districts to band together in lowering/sharing costs around software, products and services. These intermediary providers often function to leverage volume pricing, joint district procurements, and shared support and management services. Funding for many of these organizations often comes from local funds unless the organization is state sanctioned. Collaboratives and intermediaries are popular in many states including Michigan, California, Illinois, Pennsylvania, New York, Nebraska, Georgia, and Florida. Colorado's closest organizational grouping is the BOCES infrastructure that provide services to member districts.

As with other areas discussed, educational organizations have a wide array of successful funding options and alternatives available. Each state considers what is viable based on their policy climate, local district environment, and overall strategic objectives.

3.8 Challenges of Statewide SIS Implementations

The barriers to standardization and statewide implementation are many; however, many of the challenges typically brought to bear against a statewide implementation can also be considered benefits if implemented correctly. There are common themes that emerge nationally around challenges and this section helps to enumerate them. These can be broadly discussed in four main areas:

Technical Barriers – Consolidating operations and aligning efforts is a challenging project no matter the industry or application. In some ways, SIS consolidation closely resembles the implementation of an

approved standard commercial off the shelf system across autonomous sites, each with their own independent missions and goals that need to be aligned into a single solution. Major areas of technical concern in statewide implementations fall into several categories including:

Data Migration – Moving data from disparate systems and operational standards consumes a good deal of technical resources in the SIS consolidation process. Each organization will likely have developed standards that may or may not be aligned with the initiative. Depending on individual LEP variability, this can be a challenging process particularly when cross-district and state requirements must be accommodated through the process. Transcript and longitudinal, historical data are good examples of opportunities for healthy discourse on approach, standardization, alignment and reasonable solutions supporting operations and technical accuracy.

3rd Party Integration – LEPs typically manage their own software product integrations that require the sharing of SIS data. These interfaces can be structured (API (application programming interfaces) or database) or manual (spreadsheet based) in nature. It is advised that both LEP and state organizations have a good understanding of expectations on integrations as part of each LEP migration planning process. There are several approaches that can be used to mitigate risks in these areas particularly when many LEPs use the same product set. In these instances, it makes sense to leverage a single integration/interoperability standard rather than multiple instances of the same.

Technical Environment – A standard based technical environment is generally considered an enterprise architectural advantage. However, the process of understanding and pulling together many different technical components presents many challenges as well not the least of which are local change oriented. There are a number of components that could be aligned, but these must be balanced with overall project charter and timelines. SEAs and LEPs must agree on what are considered “in scope” for alignment and what is not. They must also work out reasonable roles and responsibilities that account for various state specific conditions. That is not to say most components cannot be aligned over time – it is simply important to understand what cost impacts and benefits are derived from each potential component consolidation.

Quality Control – Data quality and alignment activities are part of all SIS consolidations and operations. The processes of integration, alignment and consolidation generate additional technical burden on top of resource-heavy district data activities around entry, verification and error correction. Ultimately, improvements in efficiency in this area yield higher source data quality and greatly reduced error trapping/resolution across the LEP and state. This requires systemic organizational governance to identify the root causes of erroneous/inconsistent data and a willingness to make the necessary operational and process changes in current process.

Application Hosting – Moving to a statewide SIS can offer any number of options for hosting and software delivery. Many districts host their SIS installations locally (on-premise). Some host their SIS installations in a vendor-provided environment. Still others may have their systems hosted through an intermediary such as an Education Service Unit (Nebraska) or SEA (Delaware). These implementation selections all have significant technical, infrastructure, and data privacy components associated with them and so should be considered as part of the planning, support,

and cost profiles of the overall solution. SEAs should vet these options collaboratively including the districts in the decision-making process as it can significantly impact cost profiles.

SIS Customizations – SIS customizations are often undertaken by a district to provide additional tracking and/or reporting capabilities in the system. Sometimes these are related to district operations (custom report cards, program tracking, specialized data entry screens etc.) but many times they are completed to address needs for state reporting and cohort categorizations not typically found in the systems. There are significant duplication of efforts and associated financial expense in this particular area in decentralized implementations unless a SIS vendor has a specific state reporting module available. Statewide SIS deployments can help in reducing these district costs by the development of a single customization for certain functions that a majority of districts require or agree on. This is both a challenge for local districts as well as an opportunity as it will require some compromise on internal process and approaches and assumes that there is agreement on the proposed functionality. These differences can be handled through optional adaptations of the functionality that are enabled or disabled by the LEA's depending on their requirements. Cross-state governance activities help to identify and move these kinds of efforts forward. The fewer customizations performed, the lower the initial and ongoing maintenance costs for the software during its lifecycle. *This is an important concept and key factor in assessing total cost of ownership for a product.*

Operational and Policy Barriers – While technical migration is often a primary topic of statewide SIS consolidations, there are also many operational and policy barriers that influence more homogenous implementations. These areas are generally much more difficult to address as they form a fabric of local operations, individualistic perceptions and customized approaches to public education. A solid communication and foundational collaboration between districts and the SEA is generally required for the statewide efforts to be successful over the long term. Even in states where a SIS is legislatively mandated (like Kentucky and North Dakota), strong user support communities and good general cross-state governance yield better acceptance and use of the overall solution. General policy and operational concerns in priority order are as follows:

People and Change – Movement to a statewide SIS is a dramatic organizational shift in process, practice, and approach to doing work both for the SEA and the districts it serves. No one software system in a school system typically impacts people and operations more than a SIS. As such, the migration process must take into consideration the people and organizational change components something of this magnitude impacts. *Organizational change management becomes a key area of focus for district and state management for the life and long-term sustainment of the project.* Addressing it means that executive sponsorship across a district is required throughout the organization and that all impacted job classes are addressed as part of the project. How well an organization manages change is often as important to long-term success as how well the actual technical migration occurs and project deadlines are met.

Loss of Local Control – A major barrier to cross-state efforts (whether SIS or otherwise) has to do with policy, philosophy, and local orientation around control. Differentiation and local management are pillars of United States public education and many state legislatures and local boards shy away from efforts at standardizing or aligning to common processes and statewide efforts. It is a policy decision heavily influenced by loss of control perception, geographic

dispersion, local environmental policy and state political conditions. Some states like Kentucky (non-local control state) have overcome this through a focus on equity. Others like North and South Carolina have addressed it through cost savings. Still others have approached the problem through statewide communication and value proposition. The most important component to understand here is that it must be addressed early in the decision-making process through effective education, policy, and communications around data ownership and stewardship. These components are positively supported/reinforced even in states where it is not a primary determining factor in adoption.

Changing Priorities and Political Landscapes – The nature of our two-party system of government often dramatically effects state and local operations. There have been occasions where states have begun the process of statewide SIS implementation only to have the project cancelled or retracted because of leadership change or other political policy changes. Examples of this kind of challenge arose in Arizona, Wisconsin, and Rhode Island. These states moved in a direction of statewide alignment only to have those efforts redirected based on a combination of policy, leadership, and/or political environment. The best way to ensure the longevity of an implementation is through long-term SEA and LEP unified vision, effective communications, and well documented concrete financial and operational value to the state.

Funding – Statewide SIS funding can be implemented through several different strategies and mechanisms. Every successful state implementation must have a consistent operational and sustainable funding model for the project to succeed and be maintained. A solid basis for the request justification based on a combination of cost savings, and optimized services is commonly used across a state with clear messaging supported at the SEA and districts. If many of the other challenges mentioned in this section are addressed, the funding component becomes significantly easier to justify as the most common arguments for non-adoption are managed as part of the overall requirements, communication, and implementation plans.

Final Thoughts – Almost half of the states and territories have either attempted, are discussing, or have implemented some version of a consolidated SIS or data acquisition strategy as part of the service offering of their SEA. Although each implementation varies in approach, they all seek to accomplish similar goals of reducing costs, increasing operational efficiency, and enhancing data quality. Successful implementations focus on states as a unique educational ecosystem where local agencies have an important voice in process, governance, and operation. SEAs that view the project from technical and human capital perspectives and engage stakeholders during and after implementation have the greatest returns on investment and the highest customer satisfaction. While there are inherent challenges, many can be effectively mitigated with appropriate planning, expectation management, and transparent communications between stakeholders.

4.0 Data Reporting Process Analysis and Recommendations

4.1 Overview

Data Reporting from districts to CDE is currently accomplished via the Data Pipeline system. The system accepts files defined by interchanges that are used throughout the year to submit data:

- Student
- Staff
- Special Education
- Discipline
- Special Education IEP
- Standard Course Codes
- Title I
- Teacher/Student Data Link

Data is taken from one or more interchanges at specific points in time to meet the needs for snapshot submissions. These interchanges are intended to be transactional in nature therefore allowing Local Education Providers (LEPs) to submit data regularly to CDE and clean the data as they go.

While the structure and automation of the Data Pipeline was designed to ease the data burden associated with state reporting, a 2017-18 EDAC Data Burden Survey¹ showed the level of burden on districts is substantial - \$5.67 per \$1000 of Local Education Agency (LEA) revenue for rural LEPs, and \$2.85 for non-rural LEPs. Moreover, the cost of data submissions is increasing each year. Of the major collections, Student October, Human Resources, and End of Year snapshots were particularly burdensome.

It should be noted that there will always be a level of data burden required for the LEA's due to the current reporting laws that are in place. This burden could be different and potentially reduced over time with improvements to the data reporting process and or the implementation of a statewide SIS.

Among the many recommendations from the EDAC Data Burden Survey, the following are particularly relevant to this effort:

- *Pursue the use of a voluntary statewide student Information System (SIS) to create local cost savings on annual operating costs, but also to save time and effort to complete data collections.*
 - This specific suggestion was made for CDE to pull information from the statewide SIS and not require LEPs to push this information to CDE.
- *Integrate CDE data systems to bring together information from a diverse set of source systems and to design automated interfaces across systems.*

¹ EDAC Data Burden Survey: An Empirical Analysis of Colorado Local Education Agencies on Data Reporting Burden, Collections and Submissions, <http://www.cde.state.co.us/cdereval/2017-2018edacdataburdensurveyreport>.

- This would improve data quality, reduce redundancy of information and in some cases (e.g., licensure data), link to data that CDE already has.

4.2 Focus Group Process

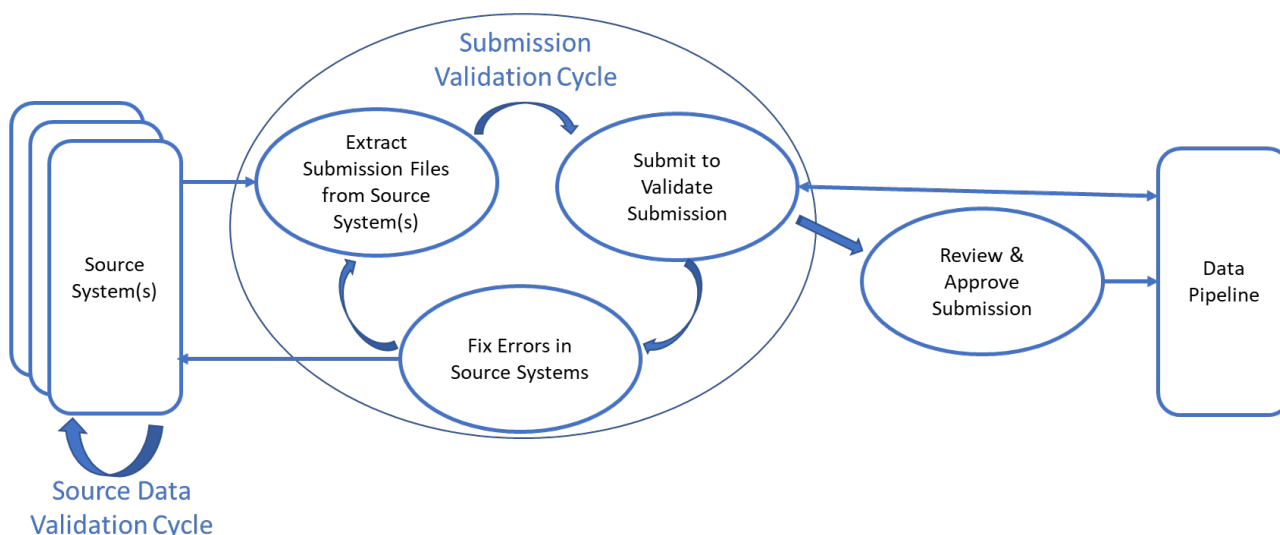
The first topic of the focus groups was to understand how the LEPs performed their data reporting process and to identify specific issues in that process. The focus group was structured as a dual-moderator session. Dual moderators typically result in a more productive session, making sure necessary topics are covered, important follow-up questions are asked, and key points and discussions are not lost.

Rather than ask specific questions, an open collaboration technique was used to have the participants describe the process they used, with the moderators probing for specific challenges faced during the process. This technique was used to eliminate any potential bias in questioning that would skew the discussions, and instead let the participants guide the flow of the discussions.

Because each of the various interchanges and snapshot collections have their own nuances, the focus group first focused on describing and analyzing the Student October collection. This was chosen because of its high stakes associated with school funding and because its source is data from the SIS. Following discussion of the Student October process, the focus group was asked to describe significant challenges with other collections.

4.3 Focus Group Findings

Across the various collections, LEPs of all sizes largely apply the same basic process, as shown below.



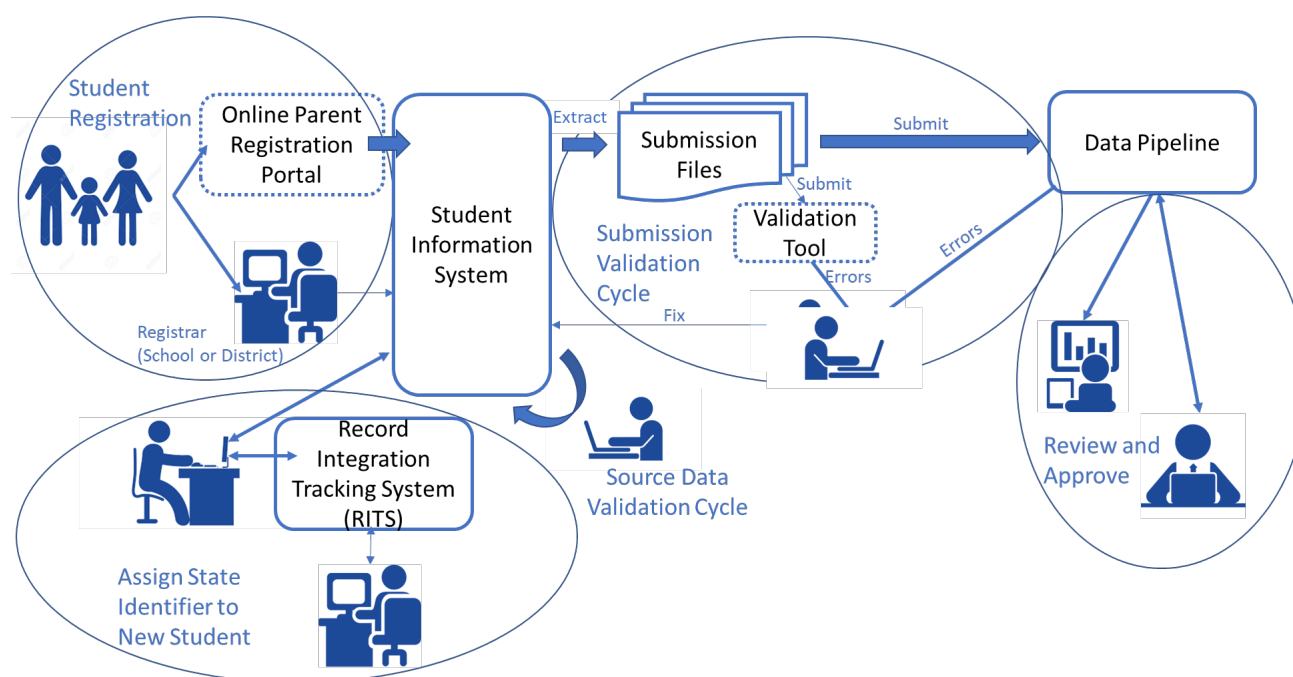
General Data Reporting Process

Data is acquired from source systems, where the SIS is a major system of record for student data. There are varying levels of local validation processes of the source data. Much of the repetitive data burden is

associated with a recurring validation cycle involving data extraction and use of the Data Pipeline product (or other tools) to check the data, respond to errors, and fix errors in the source systems. Once the submission is “clean,” it is reviewed and approved. The majority of focus group LEPs find the validation cycle to be a personnel and time burden although not all participants agreed on the level of that burden for their individual organizations.

4.4 Student October Data Submission Process

The Student October snapshot is meant to communicate student enrollments to inform school funding allocations. The typical Student October data collection and reporting process is illustrated in the following graphic.



Student October Data Reporting Process

The student registration process was noted that as having several variations:

- Registration is sometimes accomplished at each school and sometimes handled for all schools at the district.
- All our sampling of larger LEPs and some of the medium-sized LEPs have online registration portals where parents can register their students. The group felt the initial quality of registration data was better (though not perfect) when using an online registration portal.

New students must be assigned a State Identifier using the state Student ID system known as the Record Integration Tracking System (RITS) system. In the case of in-state transfer students, their identity must be queried and matched to retrieve their state ID. This requires a manual activity to request the identifier. For some LEPs, the registrar will perform this task as part of the registration process; for others, the IDs are requested in batch. Where there is possible ambiguity in student identification, a review at the state level is required. Sometimes this requires a three-way coordination between CDE, the LEP and the parents.

Because of the ties to school funding, significant attention is paid to the Validation Cycle for the October Student Count. The Data Pipeline provides a secondary facility for LEP submission validation. Some LEPs were using a separate validation tool that was licensed from a third-party vendors such as Certify or Level Data. Other LEPs use district personnel to write and perform SQL queries of the SIS database as part of the validation process. Still others use third party reporting tools such as Tableau for validation. Finally, Microsoft Access and SQL Server Integration Services are also used for some validation tasks. Regardless of the technical approach used, final review and approval by the local board president is required and accomplished through the CDE Data Pipeline product.

When contrasting the Student October process with that for other key LEP data collections the groups identified the following challenges:

- The lack of integration between the SIS and the Enrich Special Education system complicates and adds additional burden on Special Education collections. The situation often requires dual entry of data into the SIS and into Enrich.
- The Teacher Student Data Link was reported to have high data effort for what seems to be low value.
- The Student End of Year was mentioned as having the largest amount of effort largely because it deals with student transitions.
- The federally required Civil Rights Data Collection (CRDC) is generally considered large and complex, requiring significant LEP effort to produce.
- Statutory timing/reporting of certain collections (discipline and end of year were noted) do not align well with school calendars impacting data quality and staff levels of effort/re-work.

4.5 LEP Categorical Differences

The main differences among the categories of LEP are:

- The larger districts sometimes have the advantage of supporting tools to assist in the validation process, such as online registration portal and specialized data validation tools.
- Larger districts often require one or more full time personnel to handle the data Validation Cycle, where smaller districts typically share those responsibilities across existing personnel classes often with competing priorities.
- Smaller LEPs typically did not indicate a high degree of technical programming or SQL skills in house.

4.6 Data Reporting Process Challenges

The most significant challenges experienced by the majority of LEPs are described below. These areas were raised and discussed in most, if not all of the focus groups:

- The Validation Cycle is significant source of LEP data burden, incurring many operational challenges including:
 - Identifying, diagnosing and fixing data errors in source data that is inherently laborious, burdensome, and time consuming.
 - Error messages from Pipeline that are sometimes not very clear.
 - Validation activity often occurring under high deadline pressures, with active data cleansing occurring until submission deadlines.
 - A high skill level required to support the process with programming and/or SQL queries.
 - Final cross LEP CDE error checks taking too long to process.
 - SIS vendors struggling to meet the deadlines of data reporting changes as they are not always proactive in understanding and implementing required changes.
 - A wide disparity between smaller and larger LEPS with respect to capability and capacity as well as ability to afford tools that would assist in the validation process.
 - Overlap of collection windows adding to the complexity of the process.
 - A complexity and cross LEP dependence with managing changes during the snapshot process.
 - A high volume of reported errors found in discipline and attendance data.
 - While the mechanics of approval are straightforward, the required coordination, re-work, and follow-up can be time consuming.
- The lack of integration between source systems creates manual work particularly in the current deployments of SIS and Special Education tools. Cited examples include the SPED tool Enrich that typically requires some level of dual data entry between the SIS and the tool to accomplish reporting objectives. This makes SPED related collections particularly burdensome to the majority of LEPS.
- Lack of local integration for the three major LEP administrative systems – SIS, HR, and Finance – makes it difficult to link data between systems. For example, staff may be manually entered multiple times: in the HR system, Finance, the SIS, and the SPED system, thereby increasing the chances for human and data errors.
- The lack of integration with the E-Licensing System (ELS) creates issues in linking certification data in some participants. There are also employee data privacy concerns in using SSNs for teacher identification. This concern may be resolved with a major upgrade to the RITS/EDIS

system this year.

- Staff continuity and training pose challenges to maintain the necessary staff to support data reporting:
 - Staff turnover is high and filling open positions often lags.
 - There is limited staff with the required understanding of the data and the skills for validation.
 - There is typically no formal training in data validation at the district-level
- Student mobility often creates problems in moving data for in-state transfer students:
 - There is no standard *student data backpack* to move student data between districts along with necessary paperwork, such the birth certificate or immunization records.
 - Occasional errors in retrieving/reconciling a State Student ID results in duplicate IDs for the same student.
 - Because of funding implications, resolving the ownership of transfers is a high stakes activity.
- The current process for assigning a student ID requires too much human intervention:
 - Requesting an ID is manual effort; an interface to an API from SIS could streamline the activity.
 - There are too many cases that require review; an update of the match algorithm for certain nationalities should be investigated.
 - Continued attention needs to be given to preventing duplicate IDs for a student. While the percentage of these situations are very low, the effort required to resolve this is very high. The recent upgrades to the RITS and Educator Identification System (EDIS) systems are intended to address these issues.
 - There is a related problem with managing student and parent demographic information across a district application portfolio (non-CDE applications) for login access via SSO (e.g. SIS, LMS, District Reporting). Most implementations hold these security contexts within the SIS instance making integration more difficult between applications outside of the application.
- A more consistent and automated registration process is indicated due to the following observations:

- Only larger LEPs typically can afford an online self-service registration module.
- Registration processes tend to be error prone due to data entry requirements and number of registrars/consistency in process; yet the accuracy of this data is critical.

4.7 Data Reporting Recommendations

Process change is equally important to technical change. The focus group conversation talked specifically about the current functions occurring during a collection. What was not covered in great detail were how data was *initially collected and entered*. It must be noted that data burden is a function of both source data, and the internal procedures used to enter it. Participants did not always agree that the process burden would decrease but many did agree there were opportunities to improve the source data quality on entry. This is an area for additional investigation in the discussion of data burden cost reductions. That said, a statewide SIS has the potential to improve the data reporting process for the Colorado LEPs by providing:

- A consistent set of validation/entry capabilities for all districts including:
 - An online registration portal module available to all districts
 - Consistent submission validation tool(s)
- An integrated and common set of SIS capabilities that support:
 - High quality automated data submission generation, requiring the vendor to be more proactive, timely, complete and accurate
 - Streamlined student record transfer processes and technology for in-state transfers that happen in a timely fashion using features supported directly within the SIS
- High-quality, near real-time application and data integrations including:
 - Direct bi-directional integration with the RITS system, eliminating systems that require manual entry. This is available now on a limited scale with Data Pipeline
 - Bi-directional data interfaces with the statewide Enrich Special Ed system
 - Consistent, high quality staff linkages and integration with key district systems
 - Direct SIS integration with the Data Pipeline product and support for the Validation Cycle workflow
 - Potential inter-agency data exchanges between DHS, CDE, and LEPs particularly around student health and immunization certifications and cost recovery information
- Provide recurring training and data coaching to instruct, guide and assist in key LEP processes like registration, transfers, and data validation.
- Strengthen statewide data governance activities to provide enough lead time for vendor response and understanding the impact of data collection changes.

5.0 LEP and Cross-State Financial Analysis and Recommendations

This section of the report focuses on financial components and models associated with typical statewide SIS implementations. Colorado LEP costs were reviewed as well as several statewide SIS implementations. A common theme that emerged surrounding financials was the variability that occurs between and inside states when implementing an enterprise system like a SIS. Common areas of expense were found but there was inconsistent selection and comparison criteria. In fact, there are myriad of possible services, solutions, requirements, and state-specific components in each state's implementation plan and associated RFP requirements. They vary substantially based on local and state requirements. While the data in this section shows potential reductions and cost similarities when services are consolidated and software/data is standardized, it does not:

- Set a measurement baseline for overall costs as there is no consistent or common calculation/methodology across states or districts for aligning job functions, personnel, or infrastructure deployed to support SIS implementations.
- Show additional expenses and modules that are customized or purchased for some but not available to other districts and state implementations.
- Account for variability in statewide SIS vendors and selected state approaches and funding models. This greatly influences costs, services, and supports available/necessary to implement the project.
- Cover any CDE statewide additional support expenditures
- Consider centralization, existing data maturity/interoperability of LEP/State education organizations, and statewide communications/governance as critical influencers on timelines, data migrations, implementation components and costs.

5.1 Total Cost of Ownership (TCO) Common Factors and Options in SIS Purchases

Statewide SIS purchases resemble individual LEP procurements in many respects (or for that matter, any general instructional or administrative software purchase). Major differences center on custom components like state specific reporting, statewide custom modules, screen customizations, or enterprise integrations (SSO, state student id, etc.....) not often considered in a local LEP deployment. Unfortunately, there are wide variances between requirements, modules, and component services requested across a bid making a side-by-side TCO analysis impossible with current data. However, within the majority of contracts and RFPs there are common services and product delivered/grouped in the following areas that should be considered as part of the overall costs within a statewide SIS:

Initial Software Installation and Configuration – These costs are fixed, one-time fees associated with design and installation services for the SIS within the specified environment. Each time a SIS is changed, a LEP or SEA normally incurs this cost. Complexity of install and environment play a part in this expenditure as does the quality/standardization of source data and processes being migrated. Major areas of configuration include:

- State Student ID and Enrollment/Calendar management

- State, District and Building Set-up
- State and Local Validation Code-sets
- Demographics and Contact Configuration
- Attendance Setup and Configuration
- Mark Reporting Cycles, GPA Calculations, and Report Card Configuration
- Course Catalog, Credit and Scheduling
- Staff Roles, Security, and Classifications
- Parent, Teacher and Student Access Centers
- Core User Defined Screens (for custom state/local data)
- Student/Career Area Program Setup
- Online Registration
- Additional Module Setups (Transportation/Geocode, Discipline, Health, Accounting, Longitudinal Testing, Gradebook, Etc....)

Data Migration – Data migration costs vary depending on the amount of data moved, how well normalized/organized it currently is, and how many years of data must be transferred to the new system as part of the installation. These fees are normally incurred only once per implementation. Areas where data migrations often incur higher costs generally involve heavier Quality Assurance (QA) on results. A primary example would be historical student transcripts that must usually be verified as they are imported into the system against credits, GPA, and other key indicators influencing a matriculated student’s application into the workforce or higher education.

Base and Optional Module Add-Ons – SIS installations come with a “base” set of functions and “add-on” modules creating a cafeteria style selection process. These options vary based on vendor. Base modules are included within the cost of the package whereas add-on modules are selected and priced separately similar to how an automobile is priced with “standard” and “optional” equipment. Base module function and capability vary between vendors as do their options, accounting for a good deal of pricing variability among implementations. Optional modules incur additional costs above the base software and often have ongoing maintenance and support fees associated with their management. Custom module enhancements generally incur the base module fee, one-time programming fees, and an annual maintenance and enhancement fee.

State/Local Customizations – A general rule of thumb in Custom-Off-The-Shelf (COTS) software is *the more customized a software platform is to current state or local operations, the more costly it will be to implement*. This statement holds true for both State and local SIS implementations. Implementations where current processes can be adapted and changed to the existing data and workflows available in the off-the-shelf product are always significantly lower than if they must be customized. This is particularly true in areas where additional data fields and validation logic are requested. Typically, when a module or functional customization is completed, there is an additional “maintenance and support” fee added as an ongoing cost for the modified code base. Obviously, the more customized the module, the higher the cost of ownership for the software over the life of the installation.

Professional Services Fees – These fees are based on “on-demand” services in technical/help-desk support, training, analysis, and/or custom programming/configuration fees. They can be priced in bundles of hours (blocks) or individually based on an hourly rate but are almost always in a “Time and

Materials” format where a fee is specified exclusive of travel and lodging. These fees may or may not be covered under Annual Cost of Living (COLA) increases depending on contract terms. Professional Service fees allow flexibility for States and LEs to provide augmentative, subject matter expertise in key support areas as well as providing supplemental services in a flexible staffing manner.

3rd Party Point-to-Point Software Integrations – Typically priced as part of the initial contract, these integrations are sometimes considered “options” or must be custom-developed for a particular implementation or software to software interface. The nature of a SIS as an enterprise collection point for key district and school operational data usually requires interfaces between other core “satellite” systems like transportation, nutritional services, special education, assessments, and learning management software. Some vendors offer “suites” of pre-integrated software as part of their offering. Depending on how the bid is written, how much integration is required, and how custom that integration is, these costs can be quite substantial as they are generally written “point-to-point” (only between the two applications being integrated). They also generally incur an annual maintenance and support fee to handle version updates, support, and software maintenance related to maintaining the custom code base.

Statewide Implementation/Interoperability Integrations – Statewide implementations often look to consolidate or ease usability for LEs. Doing so usually means providing automated connections to key existing statewide systems like State ID Assignment/Management, Unified Single Sign On (SSO), or state specific reporting customizations. For states adopting education data, interoperability, and transport standards like IMS-Global (learning management), Ed-Fi (data/system interoperability), CEDS (common data definitions), and/or SIF (data/system interoperability), other components and infrastructure are usually necessary as well. Using these standards generally incurs a higher initial cost for implementation due to the number of existing systems requiring modification/alignment, conversion and data mapping of existing systems, and standardization/modernization/alignment in approach but results in long-term non-software specific bi-directional interoperability. By working with vendors and architectures that support standardized, rule-enforced integration, software customization costs can be lowered by elimination of the many point-to-point integrations that typically exist in statewide and district systems. Examples of successful implementations of this kind of alignment include Wisconsin’s WISE system and the Michigan Data Hub project.

Annual Cost of Living Adjustment (COLA) Factors – Many multi-year contracts have a COLA factor applied to the contract associated as an inflationary mechanism for annual increases. The COLA can be based on federal, state, or mutually negotiated factors. Depending on size and scope of the contract, this also influences the total and annual contract costs.

Software as a Service (SaaS)/Platform as a Service (PaaS) Hosting – Vendor-provided “cloud” based hosting of software offers a number of technical and financial advantages to on premise self-hosted solutions. Business and education communities are trending towards wide acceptance of this remote mechanism for computing and applications. It is generally accepted that the offering increases data and information security, reduces capital, facility, personnel, and maintenance costs, and usually offers higher availability and fault tolerance than self-hosted solutions. These fees are usually accrued on a monthly basis and may or may not be subject to COLA increases.

SIS vendors offer a variety of options and delivery choices for this type of service. Increasing levels of security, function, service levels, and hosting platform independence, generally increase the costs of the services. SaaS and PaaS services also can scale for performance purposes far easier than on premise solutions and so offer better user performance when managed and tuned correctly. The current trend is to apply Service Level Agreements (SLA) to the hosting components selected. North Carolina DPI is a good example of an SLA implementation on a statewide SIS.

Maintenance and Support – This is an ongoing expense built into the majority of state and local contracts. Fees usually accrue in the second or third full year of a contract and generally range between 10 and 20% of the individual custom, module, or license fees. This service supports regular development and support patching, release control, testing and version upgrades as part of the fee. Terms of maintenance and support components are often negotiated as part of the procurement process.

5.2 Other Operational Factors Influencing SIS Installation and Migration Costs

In addition to general factors mentioned in the prior section, other agency-specific concerns often impact the cost and timing of a major technical project like a SIS implementation. The most common specific influencers include:

Agency and Local Technical Infrastructure Requirements/Architecture – The size, location, and priority of data and technology typically varies widely in most LEP and SEA agencies. Colorado exemplifies this statement as a wide diversity was found in LEP size, approach, and implementation components from a technical perspective. Those who have a strategic focus on student data and general technology often have a higher degree of integration, customization, complexity, and infrastructure to support their objectives. In smaller districts, focus is often on mechanisms to maximize returns and meet basic compliance requirements. Each LEP requires time to understand specific requirements related to annual state reporting SIS changes as well as developing strategies to address implementation components. This generally translates into a more involved and time-consuming migration process unless industry data standards and interfaces are in use to assist the agency in migrations.

Agency Data Capabilities – Because LEPs are largely locally controlled entities with a high degree of independence, technology capabilities vary greatly across the community. Organizations with a higher degree of technical capacity typically have more standardized, advanced, and automated technology processes lessening the burden (and associated costs) of migration and ongoing operations. However, they typically have more component interfaces to manage.

Smaller organizations often have limited staff, more point to point interfaces, manual integration points, and require more human intervention. Although sometimes simpler in technical approach, manual processes also introduce more variability in data quality and introduction of human error into processing as well as more ‘soft’ human resource costs to align and migrate data. Understanding where each LEP (and the SEA) lands in this gradation, helps in the planning and risk management for each subproject associated with the migration.

Typically, although not always, technically advanced organizations are able to accomplish a major migration like a SIS with less technical and data management issues. It should be noted, however, that the technical capability of an agency does not in and of itself ensure a successful

migration. Highly evolved process, communication, and organizational management are just as important in influencing the success of major technology projects.

Amount and Types of Customization – The number one influencer in implementation expense is migration of custom code, screens, fields, tables, and other constructs not found in the ‘core’ off-the-shelf offering of a vendor solution. In fact, private businesses and public entities who highly customize COTS products often spend several times the amount on the customization compared to the actual software licenses.

Depending on the degree and complexity of the customizations and interfaces, a substantial cost of ownership can be incurred either at the SEA or LEP level to accommodate specific state rules and processes. Finding ways to align and negotiate processes, procedures, and data elements is a large part of the SIS planning process and pays large dividends for states and districts moving toward a more consolidated and unified software environment. In general, using vendor provided tools and minimizing customizations will yield high returns on implementation timelines and overall project costs.

Number and Types of Software/Infrastructure Integrations – System integration and interoperability is the process of exchanging data between applications. However, not all integrations are created equally. In most instances, those that share data through standards and operational data stores are more efficient. Point-to-point interfaces (also known as a direct custom connection point that is typically accomplished in a “batch” (usually nightly) mode) between applications is more expensive to initially implement and maintain over the life of the product.

It is important to note that both integration and software customizations have a far higher development and maintenance life cycle cost than using vendor provided tools, utilities or standards-based data exchanges in the long term. Understanding what the LEP community currently employs and the scope necessary to accommodate their profiles offers opportunities for LEP collaboration, cost sharing and better cross-district communications/governance. There are usually many LEPs in a state using the same (or similar) applications. When possible, only one integration should be completed per application to maximize the cost savings statewide. SEA and LEP ecosystems where this are part of the operational construct are able to realize large financial benefit by reducing redundancy and duplicative work.

Number of Students – In public education, one of the largest factors in cost determination and financial savings has to do with the number of students served by an application. Often, volume license discounts are offered by vendors and there are real opportunities for large pools of users to exact substantial overall cost savings during a statewide procurement. In states where mandatory use is implemented, a set “per-pupil cost” is typically negotiated as part of the process. For states who use voluntary use approaches, there are usually pricing “tiers” negotiated that help all to benefit from lower costs as more districts align (and pupil count increases) towards the standard. It benefits all stakeholders to have the largest population of students possible participating in the system.

Service Level Agreements (SLA) – A SLA is a performance warranty based on a level of service provided. This is not normally provided as a part of a base contract unless specified specifically

by the SEA or LEP in an RFP. All SLA's have a definition of the terms and penalties for non-conformance. A well written SLA can benefit the state and districts by guaranteeing service availability, data breach, response times, and other key determining operational factors for overall vendor performance. It is one way to help manage and mitigate the risks associated with large scale software implementations. This often shifts performance risk to the vendor and thereby increases the total contract cost. However, the benefits to the state often outweigh the risks particularly in cloud-based delivery and liabilities surrounding an outage that can impact users on a statewide basis.

Contract Terms and Conditions – Contracts manage risk between the issuer and vendor. Contracts where unlimited liability and indemnity are specified shift risk heavily towards a vendor and to compensate, the vendor will often increase costs. This is also why fixed price contracts are always more expensive than an augmentative time and materials agreement. Unfortunately, most states have “standard” terms that cannot be modified. They are often in state constitutional/statutory language and as such should be considered a cost of doing business. Other terms, however, are negotiable and should be well understood prior to RFP and award. It typically speeds the award process and can afford a state the ability to leverage terms against overall contract price for the SEA and LEP community.

5.3 Potential Statewide Funding Models Overview

Colorado specific funding models do not substantively differ from those discussed in the Statewide SIS Comparison section of this document. States typically take one of four approaches in terms of funding their statewide efforts:

- **State Procured and Paid** – The legislature typically appropriates funds to the SEA supporting the statewide SIS effort.
- **State Procured/Districts Split Costs** – States procure and pay for a portion of the expense splitting costs with local districts in this model.
- **State Negotiated/District Paid** – The state procures on behalf of all districts leveraging volume pricing but does not actually purchase the district software for the LEP.
- **Other Funding/Implementation Models** – Some consolidation and optimization can also occur through local district collaboratives and intermediaries or through technical standard adoptions. It is not unusual for districts to band together in lowering/sharing costs around software, products and services either through a lead district or a more formally chartered intermediary structure. Colorado's closest organizational grouping is the statewide BOCES infrastructure.

There is also great flexibility to create hybrid solutions that incorporate components of several financial and structural delivery models. As with other areas discussed, educational organizations have a wide array of successful funding options and alternatives available. Each state must consider what is viable based on their current politics, policy climate, local district environment, and overall strategic objectives. For more detailed information on funding vehicles available to Colorado please see information provided in the Statewide Financial and Structural Models Section of the report.

5.4 Colorado Categorical LEP Expenditure Analysis and Insights

Focus group overview sessions provided context setting around funding approaches and alternatives for a statewide SIS. Live session conversations were centered on several common themes and assumptions around how Colorado funding would proceed across LEP categories. One fact was clear in discussions and analysis: *Each Colorado LEP has a unique and specialized implementation of their SIS.* Whether this is necessarily required or simply a factor of decentralization in the current process continues to be a conversation across LEPs in the state. Areas mentioned where financial costs could be reduced were noted:

- Fewer/common direct state specific customizations
- Functional Equity across LEP SIS module offerings
- Better and more consistent statewide training and support
- Fewer/more consistent software interfaces
- Lowered overall SIS costs for LEPs

Individual prioritized opportunities and challenges associated with a statewide SIS are provided later in this document. All live focus groups also expressed some concerns on funding models that *could* or *would* be viable within a Colorado context. Further, many districts are currently content with their current environment and do not believe there would be a short-term benefit to moving in a statewide SIS direction. However, participants and respondents also see value in understanding what alternatives are available and pursuing the concept further before making a final decision.

Online survey results correlated these observations and also provided insights around current LEP expenditure patterns associated with current SIS expense. A good portion of this content has been provided earlier in the financial survey analysis section of the document. However, some additional specific observations and insights can be drawn from session and survey data based on LEP category.

Functional Equity – LEP Category 1 and 2 commentary and discussion around this item was covered across all sessions. Currently a great disparity between individual implementations exists. Focus groups varied in detail but commonly believed there would be value in some statewide services providing similar/useful functionality across all Colorado districts. Category 3 districts also realized this disparity particularly in staffing and interfaces. Interest across all groups was expressed around the opportunity for better training, support, communications and sharing as well as reducing duplicative efforts across LEPs. All these discussion areas focused on better coordination, communication, and collaboration across the state.

Vendor Leverage - Price-point reductions were mentioned as a large benefit to Category 1 and 2 participants. Additionally, all categories believe there was substantial vendor leverage available through statewide conversations, alignment, and shared goals. Category 3 districts focused conversations on common interfaces and customizations and better aligning their efforts statewide. Almost all groups hoped for a better statewide Enrich system integration as well as more coordinated efforts around student transfers and Student ID management.

Lowered LEP Costs – All categories shared a general belief that bulk statewide purchasing power would provide a lower cost profile for all but the very largest districts. This belief is correlated across other

statewide implementations where cost savings generally range between 15-25% per pupil in many models.

Shared Service Economies – Category 1 and 2 districts believed there to be substantial benefits in training, support, and common technology services that are currently individually sourced. Category 3 districts felt this to be less of a direct burden, but also recognized the economies of scaled around more consistent SIS processes that lead to consistent support, consulting, and education services.

5.5 LEP Financial and Operational Concerns

Not all LEPs saw a move in a statewide direction as a positive directional shift. Even those who realized benefit also found potential downsides to a statewide SIS. In terms of perceived issues raised by the focus groups, concerns fell in the following areas:

Lost Return on Investment (ROI) – Category 2 and 3 districts particularly view loss of accomplished work as a significant issue in a statewide SIS rollout. Districts mentioned significant outlays of personnel efforts and financial costs in creating interfaces, customizations, and a body of practice around their own SIS implementations.

Current SIS Investment - All categories raised concerns around their currently SIS investments. Not surprisingly, LEPs view their SIS as tightly integrated within their environments and were concerned about staff and process impacts within their agencies and schools. Some also mentioned they had recently completed migration to a new SIS and were hesitant to invest the resources to do so again right away.

Soft Staff Costs – Several LEPs across categories raised change and education opportunity costs as significant challenges. Training staff, particularly teachers and support staff continue to present an issue across the country from initial implementation and ongoing support perspectives. Moreover, technology improvements have added improved parental and community accessibility to information requiring better infrastructure, security, and administrative procedures. Many also mentioned costs to re-train and migrate data as an area of concern. Finally, overall organizational change management topics were voiced across operational, technical, and management disciplines. It comes as no surprise that all LEPs have a valid concern about their existing investments in institutional knowledge, approach, resources, and efforts around their current system deployments.

Vendor Allegiance – Many LEPs across categories *like* their current SIS and don't really relish a change. This particular item is not specific to a particular software implementations and is noted across all aspects of education technology from hardware to instructional applications. Applications and hardware districts have invested in, and where staff have learned a product first; typically win a great deal of organizational, department specific, and *emotional* support internally. Colorado LEPs do not differ significantly from other districts nationally in this respect. Organizational change management cannot be stressed enough as a key influencer in the value proposition for a project of this magnitude.

All these LEP concerns provide a landscape where there is potential long term financial, resource, and data burden reduction benefits to LEPs but where there are also significant cultural and internal operational change management issues to be openly discussed, clearly

articulated, and regularly addressed. While raw numbers point to the potential of a significant cost savings, it is only through effective organizational change that the true benefit of the statewide SIS will be realized. The table below outlines respondent divergence in per pupil costs across Colorado LEPs. It should be noted when reviewing this table, that per pupil aggregate costs often do not compare an exact mapping of feature and function to a particular LEP. More analysis would be helpful to granularly compare SIS contractual obligations between LEP organizations.

5.6 Colorado LEP Categorical Comparisons and Insights

The table below reviews total reported expenditures and per pupil costs for LEPs responding to the online financial survey. These Colorado specific results are compared to a national average of \$5.78 per pupil across other reported statewide SIS deployment costs. From this data, the following observations are noted:

- Smaller, rural districts pay a much higher per pupil cost for their SIS instances than all other Colorado LEP categories.
- Larger metropolitan districts pay more than midsize urban districts likely due to increased services, interfaces, support, additional modules and product customizations.
- All groups would likely realize some savings in a centrally procured model with smaller rural districts likely reaping the most significant benefit in increased function and reduced costs
- Large per pupil costs in smaller rural districts may also be attributed to a minimum Colorado funding model for LEPs with very small pupil counts.
- Potential PPC cost savings can be substantial to a LEP even when smaller dollar amounts are observed.

N	Category	Reported Contract Cost	Reported PPC	Potential PPC Savings	LEP Category Avg	National Avg	Difference
1	Remote/Outlying Town	\$10,386.00	\$14.00	\$8.22	\$18.22	\$5.78	\$12.44
1	Remote/Outlying Town	\$8,000.00	\$38.00	\$32.22			
1	Remote/Outlying Town	\$2,557.50	\$51.15	\$45.37			
1	Remote/Outlying Town	\$51,252.00	\$20.62	\$14.84			
1	Remote/Outlying Town	\$11,168.00	\$14.00	\$8.22			
1	Remote/Outlying Town	\$25,000.00	\$10.00	\$4.22			
1	Remote/Outlying Town	\$44,000.00	\$12.22	\$6.44			
1	Remote/Outlying Town	\$6,917.50	\$19.76	\$13.98			
1	Remote/Outlying Town	\$32,260.00	\$13.44	\$7.66			
1	Remote/Outlying Town	\$31,000.00	\$6.20	\$0.42			
1	Remote/Outlying Town	\$14,343.00	\$12.69	\$6.91			

N	Category	Reported Contract Cost	Reported PPC	Potential PPC Savings	LEP Category Avg	National Avg	Difference
1	Remote/Outlying Town	\$15,000.00	\$5.76	-\$0.02			
1	Remote/Outlying Town*						
1	Remote/Outlying Town	\$7,000.00	\$80.00	\$74.22			
1	Remote/Outlying Town	\$2,000.00	\$5.00	-\$0.78			
1	Remote/Outlying Town	\$20,989.00	\$18.81	\$13.03			
1	Remote/Outlying Town	\$106,775.00	\$11.14	\$5.36			
1	Remote/Outlying Town	\$25,000.00	\$16.60	\$10.82			
1	Remote/Outlying Town	\$11,168.00	\$12.70	\$6.92			
1	Remote/Outlying Town	\$86,000.00	\$15.00	\$9.22			
1	Remote/Outlying Town	\$32,886.00	\$16.73	\$10.95			
1	Remote/Outlying Town	\$24,844.00	\$7.00	\$1.22			
1	Remote/Outlying Town						
1	Remote/Outlying Town*						
2	Urban/Suburban	\$115,000.00	\$4.04	-\$1.74	\$6.08	\$5.78	\$0.30
2	Urban/Suburban	\$82,000.00	\$8.20	\$2.42			
2	Urban/Suburban*						
2	Urban/Suburban	\$38,000.00	\$6.00	\$0.22			
3	Denver Metro	\$750,000.00	\$7.00	\$1.22	\$7.63	\$5.78	\$1.85
3	Denver Metro	\$600,000.00	\$7.06	\$1.28			
3	Denver Metro	\$299,000.00	\$9.64	\$3.86			
3	Denver Metro						
3	Denver Metro	\$240,000.00	\$9.14	\$3.36			
3	Denver Metro	\$300,000.00	\$6.00	\$0.22			
3	Denver Metro	\$62,566.00	\$7.00	\$1.22			
3	Denver Metro	\$423,722.28	\$7.59	\$1.81			

*- Excluded from data calculations due to erroneous or inconsistent data

Note: Reported data presented is an anecdotal LEP summary of contract expense and per pupil costs and not a complete reflection of “total cost” of product ownership. Not included in these numbers are the LEP migration costs or the CDE support costs for the implementation and long-term sustainability of a Statewide SIS. Multiple factors are often not tracked or managed across districts or statewide implementations consistently in a way that easily allows for side-by-side analysis. This data

represents a snapshot “least common denominator” comparing basic product and licensing costs between groups.

The second table provided below compares and extrapolates potential cost savings across the state based on the data provided above. The LEP PPC Average provides a per pupil cost across all categories of Colorado LEPs. The total student count for Colorado is based on 2018 student counts. As illustrated, statewide license fee savings are anticipated to exceed 4,000,000 dollars. Other potential economies of scale in shared, collaborative, or common modules, are not accounted for in this table.

Total Colorado LEP Survey Count		447,201
Total Colorado Student Count		910,280
LEP PPC Avg		\$10.64
Avg Current Categorical PPC Cost (Survey Count*Avg Student PPC)		\$4,759,996.11
Avg Current Statewide Cost (CO Student Count*Avg Survey PPC)		\$9,689,004.56
Potential Statewide Cost (Avg National PPC*Number of Students)		\$5,261,418.40
Potential Yearly CO Statewide PPC Cost Savings		\$4,427,586.16
LEP Category	Reported Avg Per Pupil Cost	Reported Avg Yearly Contract Expense
Category 1 - Remote/Outlying Town	\$18.22	\$24,719.39
Category 2 - Urban/Suburban District	\$6.08	\$78,333.33
Category 3 - Denver Metro	\$7.63	\$382,184.04

5.7 National Statewide Expenditure Summaries and Insights

Across the country, nearly half of states have entertained the concept of a statewide SIS in some fashion. In business, the concept of consolidation and alignment have long been known as significant mechanisms to lower costs and align mission, services, and products. This section discusses the national SIS landscape as it applies to financial approaches. While there are some universal commonalities, it is also true that there are many variations and alternatives to funding such an effort. However, several broad general observations can be made related to statewide fiscal implementations:

Lowered LEP Total Cost of Ownership (TCO) – TCO is a generic term describing the “total” cost savings associated with a particular implementation model. The variables and methodologies vary on how this value is calculated, but the resultant uses for the outputs are very similar. A primary driver for all statewide implementations is cost savings both at the state and local levels. Although these savings vary widely between implementations based on alternatives, options, and services, all focus on providing economy of scale and alignment based on meeting the needs of larger populations of students.

Higher Return on Investment – All statewide application implementations seek to return value for the public monies spent against a particular product or service. In specific terms associated with a SIS, this translates into alignment of disparate processes, elimination of duplicate efforts, common customizations/integrations, consistent delivery and level of service, and higher initial data quality that lowers burden across the educational ecosystem. States vary in how many of these aspects they tackle in their implementation and how they approach each area. However, there is almost always a focus on developing commonalities and eliminating inefficiencies through the process.

Providing Equitable Applications and Services – All SEAs seek to provide higher degrees of support and services for the districts and charters they serve. The majority of Statewide SIS financial efforts seek to do this by reducing LEP data and personnel burden, providing increased value and helping districts to more efficiently use limited funding to support their instructional efforts. Most Statewide SIS implementations help to provide a more consistent and efficient set of applications for all districts to use. Many also provide core shared services and customizations. Still others lower LEP technical infrastructure costs by assisting with the operational hosting environment. The ultimate end goal described by many SEA organizations is to lessen the administrative expenditures for districts and allow those funds to be redirected toward instructional pursuits.

5.8 Statewide Summary Data and Explanation

Statewide SIS implementations vary greatly in approach and scope. For this reason, it is difficult to make a side-by-side comparison of the actual reported costs and call them equivalent. Research across the states took the form of internet research, review of awarded contracts, and individual SEA CIO conversations. The following example was provided by the North Carolina Department of Public Instruction (DPI):

Example of cost savings for State-negotiated Student Information and Instructional Improvement Technology System

	Initial Costs (non-recurring)	Maintenance Cost (recurring)
State negotiated	\$15/student	\$9/student
Locally negotiated*	\$69/student	\$15/student
Difference	\$54/student	\$6/student
North Carolina student count	1.5M	1.5M
Savings to Taxpayer if applied to North Carolina	\$81M (one-time)	\$9M per year (Annual)

*** Locally negotiated rates for a district of 70,000 with subset of the actual products that North Carolina Department of Public Instruction negotiated. Savings are likely understated since average size of North Carolina district is 6,000, which would yield even higher costs due to fewer economies of scale.**



Note that this particular example includes not only a statewide SIS but an additional Instructional Improvement System/Application Suite. It is clear there are large financial savings to the state and districts in one time and ongoing basis, but these savings cannot easily be directly transferred or extrapolated to another state implementation as there are many state-specific variables and options impacting final pricing components. When reviewing the following statewide comparison tables, please keep this example in mind and remember that many variables influence the absolute per-pupil cost. A direct comparison should not be made nor should any inference as to what a Colorado pricing and services structure might be should the state pursue the concept further.

Colorado Department of Education - Statewide SIS Value Assessment Results and Recommendations Report



	Arkansas	Delaware	Hawaii	Indiana	Kentucky
Agency Custom or Vendor Solution	Vendor Solution	Vendor Solution	Vendor Solution	Agency Custom	Vendor Solution
Annual Maintenance Cost	\$825,454.94	\$1,155,000.00	Not Available	Not Applicable	\$5,550,000.00
Cloud Based Offering	Yes	Yes	Yes		Yes
Continuous Years	20	18	2	3	12
District Usage Percentage	100.00	100.00	100.00	Not Available	100.00
DOE Staff Member Usage	Yes	Yes	Yes	Yes	Yes
Implementation Phase	Ongoing Operations	Ongoing Operations	Ongoing Operations	Initial Implementation	Ongoing Operations
Initial Implementation cost within past 3-5 years	Not Available	500,000.00 \$	Not Available	1,630,000.00 \$	Not Applicable
Per Pupil Cost	1.93	8.13	Not Available	Not Applicable	6.70
Percentage of cost paid by DOE	100.00	100.00	100.00	100.00	75.00
Percentage of Students Impacted	100.00	100.00	100.00	Not Applicable or Not Available	100.00
Procurement Method	RFP	RFP	RFP	Private Foundation Grant	RFP
Service Name	eSchoolPlus	eSchoolPlus	Infinite Campus	Link - Data Exchange	Infinite Campus
Source Code Availability	No	No	No	Yes	No
System/Service Description	Arkansas Statewide SIS	Delaware Statewide SIS	Hawaii Statewide SIS	Ed-Fi Standards Implementation	The authoritative source for data on students. Contract includes ability to procure eTranscript.
System/Service Provider	PowerSchool - Sungard Products	PowerSchool - Sungard Products	Infinite Campus	Ed-Fi Data Architecture	Infinite Campus
Years Left On Contract	Not Available	1	3	3	2

	Nevada	North Carolina	South Carolina	Virginia	North Dakota
Agency Custom or Vendor Solution	Vendor Solution	Vendor Solution	Vendor Solution	Vendor Solution	Vendor Solution
Annual Maintenance Cost	\$4,054,000.00	\$7,398,989.00	\$3,610,536.75	Not Applicable or Not Available	Not Available
Cloud Based Offering	Yes	Yes		Yes	Yes
Continuous Years	2	6		Not Available	3+
District Usage Percentage	100.00	100.00	100.00	90.00	60.00
DOE Staff Member Usage	Yes	Yes	Yes	No	Yes
Implementation Phase	Ongoing Operations	Ongoing Operations	Ongoing Operations	Ongoing Operations	Ongoing Operations
Initial Implementation cost within past 3-5 years	Not Available	Not Available	Not Available	Not Available	Not Available
Per Pupil Cost	8.40	4.79	4.75	Not Available	Not Available
Percentage of cost paid by DOE	Not Available	100.00	100.00	0.00	Not Available
Percentage of Students Impacted	100.00	100.00	Not Available	50.00	Not Available
Procurement Method	RFP	Sole-Source	RFP	RFP	RFP
Service Name	Infinite Campus	Powerschool SIS	Powerschool SIS	Powerschool SIS	Infinite Campus
Source Code Availability	No	No	No	No	No
System/Service Description	State Cost Split - The Cost per student for State Edition is \$2.20 per student. Districts pay an additional \$6.20 per student licensing and hosting cost	North Carolina Statewide SIS	SC State Wide Student Information System	State procured Powerschool Suite is about 90% of state usage	Initially mandated, now mandated with exceptions. About 65% of the state uses the statewide offering. State collects using state module
System/Service Provider	Infinite Campus	PowerSchool	PowerSchool	PowerSchool	Infinite Campus
Years Left On Contract	1	1		Not Available	Not Available

Colorado Department of Education - Statewide SIS Value Assessment Results and Recommendations Report



	South Dakota	Montana	Alabama	Puerto Rico	US-Virgin Islands
Agency Custom or Vendor Solution	Vendor Solution	Vendor Solution	Vendor Solution	Custom	Yes
Annual Maintenance Cost	Not Available	Not Available	Not Available	Not Available	Not Available
Cloud Based Offering	Yes	Yes	Yes	No	Yes
Continuous Years	3+	3+	<1	10	3+
District Usage Percentage	100.00	100.00	100.00	100.00	100.00
DOE Staff Member Usage	Yes	Yes	Yes	Yes	Yes
Implementation Phase	Ongoing Operations	Ongoing Operations	Initial Implementation	RFP	Ongoing Operations
Initial implementation cost within past 3-5 years	Not Available	Not Available	Not Available	Not Available	Not Available
Per Pupil Cost	Not Available	Not Available	Not Available	Not Available	Not Available
Percentage of cost paid by DOE	Not Available	Not Available	Not Available	Not Available	Not Available
Percentage of Students Impacted	Not Available	Not Available	Not Available	Not Available	Not Available
Procurement Method	RFP	RFP	RFP	Not Applicable	RFP
Service Name	Infinite Campus	Infinite Campus	Powerschool SIS	Custom Coded SIS	Powerschool SIS
Source Code Availability	No	No	No	Not Available	No
System/Service Description	South Dakota has a good governance structure consisting of districts, state, and vendor.	Statewide SIS integrated with Parchment transcript systems statewide	Procured in first quarter of 2019. Currently in implementation stage statewide.	RFP to replace custom system should happen in 2019. Moving to vendor based solution	Island wide Powerschool implementation - hosted.
System/Service Provider	Infinite Campus	Infinite Campus	Powerchool	Agency Custom	Powerchool
Years Left On Contract	Not Available	Not Available	Not Applicable	Not Available	Not Available

5.9 Statewide LEP Financial Analysis and Recommendations

LEP Survey and focus group comments show a wide disparity in overall feature, function, and pricing across Colorado LEP SIS installations. Category 1 and 2 districts appear to be at a distinct disadvantage in staffing and funding to support commonly needed modules as well as more advanced/automated mechanisms to reduce data burden. Equity in modules and efficiency was also a common theme of these discussions and comments even with large Category 3 urban districts where they believe more collaboration and sharing of information/assets would generally improve current processes and systems. Finally, there was wide discussion across all the categories about the feasibility of a funding model based on a set of policy and legislative assumptions. It will be important to manage this particular observation to ensure the selected financial approach is viable in both philosophy, reality, and practice.

All districts perceived that they might lose their existing financial investments, institutional work, and LEP specific technological advances through a statewide adoption. As seen later, this was both a fundamental opportunity as well as a current challenge for a potential statewide SIS implementation. Comments indicate that clear expectations, funding/operating agreements, and timelines would go a long way towards alleviating these concerns. In fact, managing the operational change across the state is in many ways more critical than the funding model selected. Best practices in project management bodies of knowledge confirm that poor change and expectation management will likely limit the overall benefits of the project.

The following recommendations aligned with other state-wide implementations supporting financial models for a Colorado Statewide SIS:

Define a Clear Funding Approach – A substantial portion of LEP participants endorsed the concept of a fully state-funded SIS if the project were to move forward. This approach certainly supports the largest LEP cost saving proposition from potential financial and personnel perspectives. However, many participants did not believe this was a reality in Colorado based on current policy and agenda. Many believed a split funded or centrally procured solution to be the only outcome possible across the state.

More discussion and investigation into the viability of the funding models is recommended before a wholesale discounting of the state-funded solution based on a set of preconceived state policy assumptions. Other statewide implementations prove out that centrally funded models *can* be successful. Whatever funding model is selected, there will need to be consistent messaging and level-setting of expectation and orientation surrounding the approach.

Develop Consistent and Recurring Communications – Although a statewide SIS implementation is largely a technology implementation project, one cannot discount the importance of clear, consistent messaging and communications and a focus on key aspects of organizational change. Colorado has several excellent mechanisms already in place in EDAC, CDE, and BOCES communications. These existing constructs can be enhanced to support a cross-state effort like this.

Successfully implementing any project requires a complete and well communicated plan to all community stakeholder groups – and it will require the buy-in of each of them to ensure the project's overall success over time. So, while it will be important to manage the tactical delivery

components of the effort, it will be equally important to address each stakeholder group's concerns and prepare messaging that supports the overall project goals and objectives of each group.

[Investigate Statewide Coalition/Governance Structures](#) – A significant change in LEP and SEA orientation is likely to occur across Colorado should a project like a Statewide SIS become reality. What were considered to be wholly independent implementations will need to be discussed in a different and more holistic statewide way to build consensus on features, processes and functions that benefit *all* LEPs.

Engaging stakeholders before, during, and throughout the project lifecycle will help to maximize the financial and functional benefits of a statewide SIS to LEPs and the state. Some consideration should be made on how CDE can help facilitate a group focused on SIS implementation and whether that requires additional statewide infrastructure and involvement or whether existing support groups like the BOCES, EDAC, CASB, and CASE can be used to effectively govern the many aspects of the system implementation and use.

[Consolidate Broad SEA/LEP Executive, Governor and Legislative Support](#) – Implementing a statewide SIS is as much a community sourcing as a technical project. It requires regular engagement across all groups that support the effort. This will require CDE executive management to engage with the State Board, Governor's office, legislators, LEP superintendents and local school boards. A clear value proposition must be made to the need, benefit, and viability of the effort. This value assessment is an excellent first step in that process but will require further detailed project planning and requirements gathering that focus on specific statewide requirements, concerns and issues. Complete vetting of the situation helps to build confidence and support for the overall concept, project, and associated implementation plan.

6.0 Colorado Statewide SIS Opportunities and Challenges

Overview

Focus groups spent a portion of the session helping CDE and the consultants understand their thoughts surrounding perceived “pros and cons” associated with statewide SIS implementation. These areas largely fell into several common categories of suggestions. Not surprisingly, some of the pros and cons were seen as both opportunities *and* challenges. This section discusses and documents LEP priorities and thoughts around a statewide implementation. Throughout the Value Assessment process, several recurring themes emerged with the survey and focus group respondents. This section annotates those LEP key points with a comparison to other statewide implementations when relevant.

6.1 Financial Savings and Funding Challenges

Across all groups, many LEP focus group attendees believe there are potential cost savings out of the box available to the local agency in a statewide contract regardless of the financial model selected. The Total Cost of Ownership has not been completely analyzed at the time of the report. It comes as no surprise that Category 1 and 2 districts typically pay more per student for their services and software than in a larger Category 3 model. It is anticipated that a pooling of total statewide numbers would further reduce costs. Prior experiences of other states prove this hypothesis to be true although there is still variance between statewide per pupil costs related to details associated with each implementation.

Financials were also considered a challenge in terms of how a statewide model might be funded initially and in the long-term. Although almost all districts were amiable to the idea of a single SIS and state-funded was their first choice, most also discounted the option as non-viable in a Colorado environment. State incentivized supports for such initiatives generally speed support for overall adoption and use of the system. There are a number of different funding alternatives that could be used to mitigate the risk, and this will be an area that CDE will need to work with its leadership and legislature to address if the project moves forward.

6.2 Functional Usage and LEP Equity

Categorized as both an opportunity and challenge, the focus groups believed there was substantial benefit in aligning some processes as well as data components for easier intra-state functions related to data classification, reporting, transfers, and transcript management. This would require change in LEP operating policy as well as captured data elements. A statewide SIS was seen as a mechanism to help to catalyze change as well as the necessary policy changes internal to a LEP. The respondents discussed establishing work groups and statewide governance as part of these conversations.

Equity of software modules and services were brought forward as major challenges for smaller Category 1 and 2 LEPs. Because of their size and cost profiles, a large challenge has been providing similar services and functions to their students. Some viewed a statewide SIS with common modules as an opportunity to potentially improve services and equity to their student populations in key areas like online registration, transportation, and smoother software integrations.

6.3 Maintenance, Support and Leveraging Commonalities

All categories of LEP expend internal human and contract resource capital to support and maintain their SIS installations. Focus groups and survey results show a wide variation in staffing levels across LEP categories with larger district installations sometimes having entire departments supporting SIS and

associated IT systems for their users. Category 1 and 2 districts universally believe there would be economies of scale and increased service/knowledge transfer services available in a statewide SIS implementation.

The majority of LEPs believe they would also benefit from shared customizations, integrations, user support and training models often associated in statewide implementations. Category 3 districts widely held that they could better leverage their resources and potentially share some of the common work that is currently duplicated across installations. This would likely result in better optimized and implemented customizations and a more collaborative environment across the state. Most also believed the shared knowledge base would greatly benefit all user classes and lower overall ownership costs.

6.4 Change Management, Release Control and System Stability

Several LEPs mentioned stability and release management as areas where a statewide SIS could both be a benefit or detriment depending on how well the system was engineered and implemented. In a well-orchestrated model, version control, enhancements, and changes would be managed and communicated via rigorous change management processes and coordinated with district, state and vendor personnel. The same would be true of hardware fail-safes and outage management. However, there were also concerns lodged that single outage could have potentially catastrophic impacts on users depending on the systems architecture deployed. While potentially true, a solid risk mitigation/disaster recovery plan and service level agreement (SLA) contract metrics would help manage the environment and minimize impacts.

Category 3 districts also mentioned that economies of scale in delivery could provide for better managed, more highly available, and fault tolerant installations than any one LEP might provide or afford on its own. LEPs also thought there could be better vendor leverage and communication in a larger statewide deployment. These comments have been proven true in conversations with other statewide SIS efforts.

6.5 Data Burden and Better Support

There is currently a great deal of variance in approach to LEP data verification, entry, management, coding, and processing as illustrated earlier in the process management section of this report. Data discrepancies exact a high resource cost from personnel in lost time, rework, and error corrections. Relatively small changes in school data collection and entry processes can have large impacts on data quality, required time, and internal personnel usage.

While most LEPs believe the current CDE Data Pipeline has helped districts to some degree, they believe there are many improvements that could help improve the current submission, verification, and acquisition processes. Examples were given around common statewide reporting modules, potential CDE assistance and support in quality management, greatly improved transcript and student transfer processes, and possibilities for improved cross-district data transfers that could ease student transitions and improve educational outcomes.

6.6 System Integration Consolidation and Customization Collaborations

LEP categories within focus groups recognized potential financial and process benefits from collaborations on software integrations, common reporting screens, and more consistent functional

modules across the state. Currently, each district prepares its own interfaces and customizations to support operations. In a statewide model, many believe there would be better opportunities to share and collaborate on many areas that are currently being duplicated among LEPs.

LEP installations were concerned about recovering their investment or losing control of work they had already completed but almost all understood that this was as much of a communication and planning issue as one of technology and resources. More work will need to be done in understanding the depth and degree of change necessary for LEP migration and concerns will need to be mitigated as part of future work. Category 3 districts also offered it would be much easier for one district to build an interface and share it with others. This concept supports best practices of better overall data governance, cross-state communication, and lowered cost of ownership.

6.7 Operational Consistency Challenges and Complexity Reductions

A general theme emerged across all the focus groups around the complex, inconsistent, and resource intensive nature of current processes and procedures for data reporting and process management. It is an area that drains internal resources and increases costs across all LEP categories. This area was considered to be one that potentially held great opportunity for improvement and was also noted as a critical challenge in local resource utilization.

Focus groups discussed in great deal the issues they encountered in duplicate/incorrect data across systems, misaligned submission components, and staff re-work as they moved across the several different annual Colorado reporting windows. They also felt there was an opportunity to review what and how these processes work today and perhaps make some structural, procedural and technical changes to lessen complexity and burden. It is a common theme mentioned in other cross-state implementations particularly in the areas of automated rule-based data quality through transactional data interfaces, a reduction in manual processes, and more common customizations.

6.8 Data Quality Improvements and Timeliness of Data

Process reviews with all LEP focus group categories noted various issues in collection data quality with several different mechanisms employed to help validate and ensure data quality. Despite Data Pipeline's unified collection architecture, there is still a large amount of manual intervention necessary to collect, verify, and eventually submit/re-submit data. Current LEP validation mechanisms include manual spreadsheet verifications, Structured Query Language (SQL) programming and reporting, manual checks and updates, data pipeline rule verification and, in some instances; third party software supporting business rule data verification. The cyclical verification nature of the current process impacts LEP timeliness of data submissions and often results in lost productivity and time.

Many LEPs seek a better and more effective way to process their data. Although a statewide SIS will not eliminate all manual intervention, it holds the potential to lessen some work efforts in this area. LEPs view this area as an opportunity. Several existing statewide implementations have effectively used a combination of standards-based data and transport technologies to aide in data automation and standards-based data rule enforcement. In fact, states like Wisconsin, Nebraska, and Michigan have successfully opted to use this solution without moving to a single statewide SIS.

6.9 Opportunities and Challenges by Category

This section provides a summary of focus group opportunities by LEP category. There is a good deal of overlap in content with those items often being the highest priority for each LEP in terms of benefit or challenge showing that a well delivered effort can maximize benefit and also reduce impact of critically viewed challenges. Additionally, the importance of proper planning and regular communication on a project of this magnitude was mentioned several times in comments and conversations. Finally, privacy and data ownership were also discussed by focus groups. Clear expectations and good statewide governance help to manage and resolve these components in other successful statewide implementations regardless of technical solutions.

Each category lists prioritized opportunities and challenges in descending order of importance. Category 1 and 2 results are combined as there was no substantive difference reported between the groups. **Bold** opportunities and challenges indicate highest priority items selected by aggregate focus group voting.

CATEGORY 1 AND 2 PRIORITIZED OPPORTUNITIES AND CHALLENGES

Opportunities:

- **Common statewide processes and procedures**
- **Consistent, full-featured features/modules across state LEPs**
- **Common statewide training, support, and understandings of data**
- **LEP Cost Savings and more functional system – worth the change**
- **Shared Services across the State (e.g. training, customizations, 3rd party integrations and migration)**
- **CDE could provide better information and analytics on our students (e.g. CTE, common drop out, at-risk populations, early warning reporting using larger populations to understand trends and causality)**
- **Better data sharing within the State (e.g. faster in-state transfers of students)**
- CDE would better understand the SIS and be able to answer questions supporting LEPs
- Centralized CDE support for state reporting
- Management and identification of specific SIS fields used for state reporting
- State/LEP Coordination when updating screens/fields
- CDE would have a better understanding of LEP efforts to accomplish CDE requests
- Common LEP tables that make for easier data submission, processes and formats
- State import of assessment scores on behalf of LEPs
- Larger pool of assessments available to LEP
- Wouldn't have to pay extra fees with our SIS
- CDE will have a system that talks to themselves
- Economies of scale
- Common course codes and instructional standards (Course master descriptions/names)
- Common statewide transportation database
- Statewide language translations
- Common assessment package – easy to use and looks good
- Standardized transcripts/transfers/report cards
- Class graduation requirements determination
- Common statewide hosting model

Challenges:

- **Training/Re-training**
- **Migration/Conversion of Data**
- **Less Local Control**
- **Agreeing on a standard**
- **Customizations**
- **3rd Party Integrations**
- **Change/Ease of Use**
- Teacher Buy-In/Change
- State Access and Data
- Data Privacy
- Loss of local processes/control, loss of job/job changes
- Statewide disaster

CATEGORY 3 PRIORITIZED OPPORTUNITIES AND CHALLENGES

Opportunities:

- **Streamline Reporting Data**
- **Cost Savings**
- **Customization Collaboration/Alignment/Sharing**
- **Integration Collaboration/Alignment/Sharing**
- **Better Data Quality**
- **Reporting should be easier**
- **Eliminate Self-Hosting**
- Easier October Counts/Collection Reporting
- Lessen Data Validation/Burden
- Cross-District Data Transfers
- Vendor Leverage
- Easier Audits

Challenges:

- **Eliminate customizations**
- **Data Privacy and State Access**
- **Complexity/Capacity – Will this help or make it worse?**
- **Data Ownership**
- **Integrations**
- **Common Identity Management**
- **Think Differently (LEP and CDE)**
- **Performance**
- SIS compatibility/standardization for those not on statewide SIS
- State/Local SIS Architecture
- Individually lose leverage over vendor
- Audit (Trust)

7.0 Statewide SIS Possibilities

Determining futures is an exercise in understanding options, weighing alternatives, and managing priorities for state and district staff. Products all have costs, associated risks, and quantifiable benefits to the communities they service. Understanding these factors helps to address concerns, lower implementation risks, align efforts and leverage limited public funding with the goal of exacting a high return for the effort and monies deployed. Based on survey and focus group feedback, there is no question that a common student information system generally has perceived value in the Colorado educational landscape.

The question then becomes a workable deployment strategy and alternatives to improving data quality, reducing reporting burden, increasing functional usage, and attaining critical mass across Colorado schools. There are many ways for a statewide SIS to be implemented and sustained and many different tactical strategies to be employed in meeting such a requirement. The purpose of this section is to provide some summary alternatives and options that support a long-term approach and several ownership and deployment options.

7.1 Potential CDE Statewide SIS Strategies

In reviewing options and alternatives, it is also appropriate to take some time to consider the strategic vision of the CDE and what its future evolution involves. It is clear that the organization strives to provide cost effective and quality products meeting compliance and high LEP service standards. All solutions presented in this section assume that LEPs maintain total control, management, and ownership of their installations, data, and security. CDE would operate as a facilitator and aggregator - leveraging economies of scale, common services, and cost savings for its LEP customer base.

Each of these possible options has direct CDE and State of Colorado costs – both hard (in operational expense) and soft (in personnel). Those costs vary based on the depth and breadth of a particular option and solution but are substantial in any enterprise undertaking. While there is not enough detail to estimate those costs at this time, a follow on to this report would be a deeper dive into the discrete costs associated with particular options.

Part of a statewide SIS strategy would also necessarily center on ongoing business and governance decisions around support, aligned product licensing, educational community ownership, future systemic viability, and overall disposition of the product as part of the state's suite of educational offerings. Realistically, there are five general approaches to a statewide SIS although several states have used components from each to formulate their individual solutions. These solutions are briefly described below.

Option 1 – Enhance, Upgrade and Automate Centralized CDE Data Pipeline Collection System (Status Quo)

This is essentially a “modernize and focus on interoperability approach” strategy that maintains the status quo in Colorado. CDE would continue to apply resources to the enhancement, upgrade and maintenance of the Pipeline product and maintain control of its lifecycle, distribution and resources. New interoperability automation and data standard updates would likely be supported aiding in reducing district data burden through various enhanced business rules/error messaging, automated validation, interoperability standards, and quality assurance

techniques. Districts would maintain their current SIS implementations in this model and provide data in a more standardized, automated transactional API model. It is anticipated that CDE pipeline improvements would likely result in some lessening of data burden on districts through transactional rule enforcement and better validation and error trapping. This option would also likely offer some performance and optimization benefits as well as maintaining current infrastructure and architecture.

Option 2 – Centrally Procure, Fund, and Support Managed Transition to a Statewide SIS

This model is the preferred selection of many of the focus group LEPs. In this model, CDE would procure and provide the SIS platform for participating LEPs. CDE would assume a facilitative and management role over the procurement, delivery platform, common modules and common LEP/SEA customizations, as well as provide some level of common shared support services to the districts. It is anticipated that districts would participate in requirements definition and be a key part of the procurement evaluation and award process.

Two major LEP concerns in this model were:

- The model would not be supported by state legislation
- LEPs would be forced to migrate

Further, many LEP participants discounted this model even though it was their preferred implementation method due to state climate and orientation towards local control. However, it should be noted that several states successfully support this type of delivery model today with some variations in scope and district compliance. State delivery models exist where this is a LEP opt-in (e.g. Delaware, Arkansas) and also where it is legislatively mandated (e.g. North and South Carolina, North and South Dakota)

Option 3 – Centrally Procure, Split-Fund, and Support LEP Consolidated SIS Options

This model focuses on providing a compromise in funding and delivery of the SIS solution. In states where statewide funding is not available, some have opted to share costs with districts providing large cost savings in lowered per-pupil costs and then further incentivizing LEPs to adopt the platform with a split share of the software cost. This model is used almost exclusively where districts opt-in to the common SIS. There are often economies of scale offered to LEPs in professional services, common module availability/discounts, and opportunities for collaborative work on shared custom functions. Nevada is an example where components of this strategy are implemented.

Option 4 – “Procure Only” LEP SIS Vendor Purchase Options

In this approach, the SEA procures a statewide SIS, or some components associated with a statewide collection, providing common pricing for all LEPs. It essentially acts as a purchasing proxy for the LEP and has been used in some states where funding is not available and locally maintained SIS installations are primary factors in a solution. Normally, the pricing in these models is “tiered” based on the number of students. The larger the number of students served, the lower the shared district per pupil costs. However, the districts purchase the software themselves. There may or may not be additional services the state provides. There may also be reduced bundled professional services available to districts for support, training, customizations



etc. There are also variations in this model where SEAs may purchase the state reporting module or common state customizations as part of the bid. Maine has a hybrid style of this type of implementation.

Option 5 – Hybrid Model

CDE and LEPs might also entertain some combination of the above models and implementation strategies in formulating a long-term statewide contract solution. There is no one “correct” way to approach a solution. Many of the options provided here are interchangeable without negative impact on outcome and as such might be combined or changed to accommodate a final product and services disposition suitable to the Colorado environment. One thing is clear in prior statewide SIS implementations: There are multiple ways to develop a solution and no two states have approached it in exactly the same way.

8.0 Final Thoughts

Clearly there is LEP interest in investigating and exploring the statewide SIS concept further. The following areas are noted as potentially significant Colorado value propositions in a statewide implementation:

- Reduction in duplicate interfaces and customizations
- Statewide functional consistency in SIS modules
- Better transparency, data security and privacy management through statewide governance and role management
- Better overall statewide data management and standards alignment
- More consolidated and secure operating platform
- Opportunities for better communication, shared LEP and SEA collaboration, support, customization, and training
- Lowered LEP and statewide SIS costs

There will also be barriers to adoption of a more centralized model. The following areas represent key challenges for the Colorado educational ecosystem to address together and develop successful solutions in implementing a project of this type:

- Managing Organizational Change
- Setting and Adhering to Realistic Project Timelines and Expectations
- Understanding LEP Requirements and Needs
- Securing LEP and SEA Executive/Legislative Sponsorship
- Completely understanding the data burden costs in time, resource, and efforts of local districts
- Addressing Initial and Ongoing Project Funding
- Instituting a Culture of Collaborative Communication and Compromise

Ultimately, the final direction and options of this statewide product implementation will be based on a number of strategic local and state objectives, fiscal priorities, and policy criteria as well as key decisions by local education providers to support such a solution. This study is meant to gather important input in reviewing potential opportunities and perceived stakeholder value, not in recommending a final (or specific) implementation approach for Colorado.

8.1 On-Line Surveys

Good response and feedback were received from Colorado LEP and charters, and specialized educational organizations across the state participating in the online survey instruments. In particular, several respondents in the LEP community felt the online data gathering modality was effective.

The cross-state survey instrument did not result in the same response or success. A better modality for cross-state SEA future work in this area might be coordinated, face-to-face joint focus group conversations through relevant common national meetings.

8.2 Focus Group Participant Commentary

There was insightful, honest commentary from focus group participants. Of the methods used to acquire information face-to-face small-group interaction was the most effective and productive mechanism for participants. As heard on several occasions, the group interaction dynamic was a very positive component that helped districts understand their peers in new and insightful ways.

Some attendees who came with predisposed notions about the event and their general orientation toward a statewide SIS left with a different perspective through the process. The focus group structure and or a LEP size specific group information gather process should be maintained and expanded if the value assessment moves forward to a next phase of requirements definition. Regular stakeholder engagement and communication will be key to CDE's efforts in this area.

8.3 Path Forward

In focus groups and surveys, LEPs expressed support for investigating a statewide SIS effort further. However, this support should not be misconstrued as acceptance. While it was clear that there are additional organizational, operational, and governance issues to be resolved across the community, there was interest in the concept it could offer to the individual and collective LEPs provided their issues are addressed. Based on this response, it is recommended that the following activities be pursued as a general path forward:

- Present the findings of this assessment to all LEP superintendents as they were not well represented during the stakeholder feedback process due to the defined focus of the assessment.
- Follow up with other states that have struggled with their respective statewide SIS implementations to fully understand their issues and how they would have done things differently.
- Review additional financial analysis of LEP's in each category to flush out total LEP costs associated with their SIS and migration costs in moving to a statewide SIS.
- Conduct further LEP data burden discussions with identified proponents of the statewide SIS to identify what specific data processes could change (reduce the burden) with the adoption of a statewide SIS.



- Thoroughly analyze and make recommendations on how a Statewide SIS can be selected by a group of LEP's without introducing any bias in the process.

Once complete, CDE will be well positioned to determine additional steps around a potential Statewide SIS implementation which would then lead to a “go-no-go”.

Implementing a statewide SIS is an enormous technical and organizational change for all stakeholder groups. It requires commitment across the entire state educational ecosystem. The best implementations are carefully considered, planned, and executed. It is only with proper communication and stakeholder sponsorship that the full benefits of this change will be realized. By taking the first step with this report, Colorado has received strong LEP input and become well positioned to continue an informed conversation.

Appendix A – Colorado LEP Focus Groups – Summary LEP Attendance



Appendix A - Focus
Group Attendance Rc

Appendix B – Colorado LEP Focus Groups - Summary Notes and Observations



Appendix - 3.26
notes Statewide SIS V



Appendix 3.27 notes



Appendix - 3.28

notes Statewide SIS V

Additional notes, images, and comments provided to CDE electronically as part of report deliverable.

Appendix C – LEP Functional and Financial Survey Results



Appendix - LEP
Financial Survey_0313



Appendix - Current
SIS Features_031319.>

Appendix D – Cross-State Survey Results



CDE Value
Assessment of Statew

Appendix E – Cross-State Summary of Statewide SIS Efforts



Appendix - Statewide
Deployments.xlsx