OFFICE OF THE STATE BOARD OF EDUCATION

State of Idaho

Statewide Longitudinal Data System Needs Analysis

Submitted
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This document provides the current state of Statewide Longitudinal Data System (SLDS) efforts in Idaho, describes the options, and makes recommendations for maturing to a P-20 to Workforce SLDS.

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Executive Summary

The Needs Analysis is intended to provide the State Board of Education with an appropriate overview of the current status and the needs for longitudinal educational data collection, the gaps, barriers, and risks, and finally to provide recommendation regarding the most appropriate path forward for collecting student level data over time.

While Idaho is one of the last states to implement a P-12 statewide longitudinal data system (SLDS), we have made great progress and are in a position to take advantage of the work of other states. As of October 1, 2010, the State Department of Education began collecting student-level data in the K-12 SLDS. The postsecondary data exists in eight varied systems that do not communicate with one another. Postsecondary data must be consolidated to meet the September 30, 2011, America Recovery and Reinvestment Act (ARRA), State Fiscal Stabilization Fund (SFSF) requirements. While the ARRA SFSF requires that states have a P-16 longitudinal data system, they do not mandate a singular system to meet the 2011 deliverables. There are gaps, barriers and risks that must be addressed as Idaho moves forward with student level, statewide longitudinal data collection. Creating a postsecondary repository, gathering postsecondary data, and linking to the K-12 SLDS is an appropriate first step to meet the required September 2011, P-16 SLDS ARRA requirements.

To successfully implement a P-20W SLDS requires a clear strategy, proper planning and design, participation and commitment from all stakeholders, support, and data management oversight.

Staff recommends the Board accept the recommendations and direct staff to move forward with Phase 1 and Phase 2 for a P-20W SLDS. Staff will work with the institutions and the State Department of Education to construct a P-20W SLDS. Phase 1 would require the development of a postsecondary repository and link to the K-12 SLDS for a P-20 SLDS. Phase 2 would require maturation of the P-20 SLDS environment. Phase 3 when approved would require finalization of the design and implementation of a complete postsecondary data warehouse. Phase 4 when approved would be the final stage, transforming to a P-20W SLDS with Business Intelligence solutions. A four phased approach allows Idaho to meet federal deadlines and reporting requirements in a manner that will preserve resources and aid proper planning and design. The four phase approach limits the burden on the institutions and still meets the requirements of the various grant information needs and reporting requirements. Phase 1 gathers the data and allows Idaho to start making data driven decisions. It is a functional solution and will provide a solid foundation for designing the P-20W SLDS. The scope of Phase 2 may be expanded when Phase 1 is completed if the institutions have available resources, or other data sources can be engaged (such as private or for-profit institutions). 

Overview

History

In 2008, the Idaho Legislature appropriated $2.5M in one-time money to the State Department of Education to consolidate data collection and begin the efforts to create a K-12 data collection system. In May, 2009, Idaho was awarded a federal statewide longitudinal system (SLDS) grant in the amount of $5.9M to fund the development of a K-12 SLDS. The development and implementation of the K-12 SLDS, also known as the Idaho System for Education Excellence (ISEE), is anticipated to have a completion date of April 30, 2012. While Idaho was among one of the last states to implement a K-12 statewide longitudinal data system, since 2007 the Idaho State Department of Education (SDE) has made remarkable progress.

In late, 2009 another federal SLDS grant was released due to the availability of ARRA money. While developmentally Idaho was not in a position to move forward, the Office of the State Board of Education (OSBE) worked with SDE and requested funding to support both the expansion of the K-12 SLDS and implementation of an institutional data warehouse at each public institution of higher education, and the implementation of the P-20 to Workforce Statewide Longitudinal Data System (P-20W SLDS) that would combine data from the postsecondary institutional warehouses, the K-12 SLDS, and the Department of Labor systems. Unfortunately that proposal was not funded.

Without that funding, the approach outlined in the grant proposal for the P-20W SLDS is not financially feasible at this time. The design of the P-20W SLDS will still need to accommodate the heterogeneous nature of the postsecondary institutions' systems from which data must be extracted and linked with the K-12 SLDS.

Current Status

- **K-12**
  - The K-12 SLDS, ISEE, began student-level data collection October 1, 2010. Pilot data loads were planned from October 1 through December 31, 2010. The system is slated to have validated data and be the official record for average daily attendance for funding. The design of the initial data "cubes" (attendance and student performance on assessments) was scheduled to be complete by December 31, 2010. Rollout of the Schoolnet application is scheduled for January 2011. Schoolnet is intended to provide teachers immediate access to data on their students; including historical information such as standardized test scores, prior class lists, student conduct information,

and more, with the end goal being able to do formative assessments to guide student achievement.

- **Postsecondary**
  - A single, consolidated postsecondary database does not exist and information is not currently collected in any central location.
  - The transactional systems at the eight public postsecondary institutions' Enterprise Resource Planning (ERP) systems are varied, consisting of PeopleSoft, Banner, Datatel, and Jenzabar.
  - OSBE Staff evaluated the viability of using the current K-12 infrastructure to house postsecondary data. A high level comparison was conducted comparing the Idaho K-12 extract, transform, and load (ETL) data elements to the Oregon University System ETL templates. The overall result was a less than 40% match of the required data elements in the current K-12 SLDS collection. There are several critical factors that complicate the ability to consolidate postsecondary data in the K-12 SLDS. Some of those factors are:
    - Postsecondary institutions have different federal and state reporting requirements than K-12. Consequently, the manner in which the data fields are defined, collected, and retrieved are fundamentally different. Institutional knowledge and history play a vital role in accommodating these requirements. The complexity and development of the ERP systems at the postsecondary institutions are far more advanced than the data collection systems in the districts, with decades of historical data.
    - The stated priority of ISEE is to get data into the classroom for teachers. They are not in a position to support changes to allow loading postsecondary data into the K-12 SLDS without the engagement of additional contracted developers and personnel to perform the entire implementation. Funding is also not available to support such an effort.
    - The postsecondary institutions were not involved in the design and development of the K-12 SLDS and their needs are not actively being incorporated into the system at present.
    - Based on OSBE staff and institutional work with SDE on the implementation of the unique student identifier (EDUID) application, it became clear there is a strong possibility that incorporation of the postsecondary education data into the K-12 SLDS would not only cause delays to the K-12 SLDS schedule but completion of the P-20 SLDS.

- In September 2010, a project was initiated by OSBE to extend the use of the EDUID application developed by SDE and used for K-12 to all public postsecondary institutions. To date, five of the eight public postsecondary institutions have successfully executed the process and created EDUID's for 2010 fall enrollment. The majority of the remaining institutions are planning to finish in early 2011.

Need for P-20 to Workforce SLDS

Federal Requirements

- Idaho is one of the last states to implement a P-12 Statewide Longitudinal Data System (SLDS). By accepting ARRA SFSF, the state agreed to four assurances, one of which consisted of implementing the 12 elements of the America COMPETES Act by September 30, 2011, which requires a P-16 SLDS. Idaho currently meets seven of the 12 elements of the Act.

Future Initiatives and Grants

- For Idaho to pursue future grant opportunities, Idaho must have the ability to track student level data from K-12 through postsecondary education. Currently, Idaho is not eligible for many of the grant opportunities because the state cannot measure student progress and achievement. As part of Idaho's participation in the Complete College America (CCA) initiative, we are required to track the progress on outcomes over time and through systems.

Strategic Plans

- The State Board of Education, in its Strategic Plan, has established the goal to have a P-20W SLDS developed and implemented by 2015. SDE is also dependent on an SLDS that includes postsecondary data to meet their goal of students prepared to continue their education without the need for remediation. In addition, the Board has set the goal that 60% of 25-34 year olds have a postsecondary degree or credential by 2020. Idaho needs the capacity to track students over time and place to conduct the analysis of where students are falling out of the educational pipeline, and to measure the effects of changes in education delivery against this goal.

Issues

Gaps

- Although a list of potential questions has been developed that the P-20 SLDS could help answer, a clear definition of the needs of the potential users has not been completed.
- Data security is a major concern. OSBE will Leverage SDE's K-12 SLDS security solutions to duplicate these successful strategies. As part of this process Idaho will also evaluate other states' implementations to guide Idaho's P-20 SLDS security implementation. Conducting an appropriate evaluation will ensure that confidential data is properly secured during transmission and storage.
- Previously, Professional Technical Educations (PTE) data needs for secondary were satisfied by the IBEDS (FoxPro) system. When SDE replaced IBEDS with the current K-12 SLDS they did not provide for PTE's information requirements to track students in technical programs. A development effort using contracted resources is underway at PTE's expense to add these elements into the K-12 SLDS.
- The proposed use of the Oregon University System (OUS) data collection templates do not include the elements necessary for PTE to produce their federal postsecondary reports for Workforce Improvement Act (WIA) and Perkins. These data elements have been identified and a final review with PTE will be required before implementation. PTE has supplied the reports they are required to produce and the necessary data elements have been identified and added to the OUS model.
- A critical requirement of any database is controlling data quality (i.e. data accuracy, standards, integrity, and completeness) from both an I.T. and business perspective. A Data Management Council will need to be established by the State Board of Education to create and steer the development of the policies and procedures necessary to properly manage the data in the P-20W SLDS and serve as the primary review point for all data management activities. The site visit from the U.S. Department of Education reported: "Data Management processes are just beginning to be implemented at the IDOE [SDE K-12 SLDS]. These processes are not yet mature. The other P-20W participating agencies are in a similar state as regards data management."[1] The Data Management Council responsibilities will include:
  - Development and oversight of a Data Management Plan. This plan will:
    - Detail the processes & procedures needed to determine access to the data and data reports at the

several levels to prevent intentional or unintentional misuse and/or misinterpretation of the data.
- Define user acceptance testing standards to ensure that the data and functions of the SLDS meet the needs of the stakeholders.
- Guide development of solutions.
- Coordinate the efforts of stakeholders.
- Define the data exchange requirements.
- Manage the Data Dictionaries for the SLDS to ensure consistent management and use of the information.

▪ Serve as the point of contact for all SLDS data issues.

- The processing of postsecondary enrollment information for the purposes of issuing an EDUID has exposed instances where matching students to existing K-12 EDUID records should have occurred, but instead, a new EDUID was created.
  - Auditing and reconciliation are manual processes, very time consuming, and have not been done on any of the school district EDUID uploads.
  - No statistics regarding EDUID match rate are provided during the matching process.
  - A detailed analysis of the issue has not been completed.
  - It is left to the school districts and institutions to provide clean data. With the wide variety of systems the school districts and institutions utilize, it is not practical to assume perfect data.
  - Additional data sources are going to have to be accessed to determine the magnitude of the issue and address it.
- The data collection requirements between K-12 and postsecondary are both very different, which is causing issues in the EDUID matching on collecting and reporting names, name changes, gender, social security number (SSN), etc. Agreements that best satisfy both SDE and postsecondary system requirements must still be made to eliminate and/or reduce these issues.

- **Agreements**
  - The long-term success of the P-20W SLDS depends upon establishing clear agreements (such as MOUs) with the non-education agencies to ensure data is provided despite any changes in staff or administration. A discussion with all of the institutions regarding the concerns they have with student privacy needs to be conducted and all issues addressed through a statewide agreement on student privacy and the P-20 SLDS.

- **FERPA violation and disclosure of Personally Identifiable Information**
  - The Family Educational Rights and Privacy Act of 1974, also known as FERPA is federal legislation in the United States that protects the privacy of students' personally identifiable information (PII). The act applies to all educational institutions that receive federal funds.[2]
    - The penalties regarding FERPA violations are limited to loss of federal money. However, the exposure can be very damaging to the reputation of the state or institution, and cost the state or institution millions of dollars to notify students of breaches in security of that data. Institutions could also be responsible for credit monitoring to detect identity theft after a release of PII. The P-20 SLDS will be constructed to meet FERPA requirements and the Data Management Council will be tasked with ensuring FERPA compliance.

- **Stakeholder Engagement**
  - Communication with stakeholders has been limited to this point. Although stakeholders have been identified, they need to be formally engaged in the review and execution of the entire P-20W project. Meeting regularly with them will be necessary to review the data elements. A communications plan will need to be established to ensure an informed and engaged process.

- **Student tracking**
  - ARRA SFSF requires Student-level information about the points at which students exit, transfer in, transfer out, drop out, or complete pre-K through postsecondary education programs. To track students transitioning from K-12 into postsecondary, data will be pulled from the K-12 SLDS and uploaded into the National Student Clearinghouse (NSC). With regard to postsecondary transitions, Idaho will also use the National Student Clearinghouse to meet this reporting requirement. OSBE will use the contract currently in place to track postsecondary transitions. The current agreement with NSC only covers postsecondary. The Council of Chief State School Officers (CCSSO) is working on national pricing agreement that would cover K-12, but no timeline has been provided.

Barriers

- **Confidential Information and Requests**
  - Due to the necessity to collect sensitive data such as personally identifiable information, Social Security Numbers (SSN's), and labor data to build a P-20W SLDS. The design of the postsecondary

repository and data collection methods will be complicated and time consuming.

- The common theme of other states that have already developed their SLDS is to highly restrict student identifiable data, provide only the required level of information, and set return/destruction dates on the data usage. An SLDS provides a wealth of information that will attract requests for information, therefore it is critical that the proper processes and procedures are in place before requests are received.

- **Distance/Location**
  - The eight public postsecondary institutions are throughout Idaho, making it difficult and expensive to conduct face to face meetings. As much as possible remote meeting technologies will be utilized to ensure participation.

- **Time**
  - Due to the requirement to have a P-16 SLDS in place by September 2011, a lengthy development cycle must be avoided by continuing to make use of the progress SDE and other states have already made.

- **Budget**
  - Current funding for constructing the postsecondary repository is limited and precludes the development of a Request for Proposal to contract out the design or development of the P-16 SLDS, or incorporating postsecondary data into the K-12 SLDS. Leveraging the OUS data dictionary, leveraging existing OSBE and institution staff, limiting consulting, leveraging the existing SDE SQL cluster, and phasing the implementation provides the most economical solution with the least amount of risk for establishing the P-20W SLDS.

- **Competing Priorities**
  - There are other major projects currently underway at both SDE and several institutions that preclude leveraging some internal resources. These include, but are not limited to, the continuing development of the K-12 SLDS, Idaho State University's conversion to Banner, Boise State University's PeopleSoft upgrade. It is anticipated that involvement by these entities will still be necessary to ensure the success of the P-20 SLDS plans for Phase 1. As much

lead-time and flexibility will be provided to minimize the impact to other projects.

- **Data Availability**
  - The end goal is the capability to track students from pre-school to the workforce. There are several hurdles to be overcome:
    - Obtaining enrollment and graduation data from Private and For-Profit institutions will be a lengthy process. There may be interest on their part to track outcomes for their students, and OSBE could provide that link in exchange for enrollment and graduation information from those entities. A recent financial aid report from the Federal Application for Free Student Aid shows over 100,000 students receiving financial aid in Idaho. The current public postsecondary enrollment for fall 2010 showed an enrollment of 69,737 students, which indicates there are at least 30,000 students enrolled in private or for-profit institutions which have not been accounted for.
    - Labor data is an important component to this effort. Typically Unemployment Insurance wage data is utilized. Currently, the only field to match labor data on is the SSN. The K-12 SLDS does not require SSN and postsecondary typically only collects it if the student applies for financial aid; therefore, there is a gap in identifying students who go directly to the workforce from K-12 or those who leave postsecondary education and enter the workforce. It may be possible to link through another agency that has both demographic data and the SSN, but this will be time consuming and may require executive order.
    - Connecting to a multitude of other state agencies will have to be negotiated individually, but other states have been successful in this endeavor.
    - Graduates who join the military or take a federal job are another group that need to be identified and the agreements created to access this information. This is another area where the efforts of other states can be used as a model.

Risks

- **FY 2012 State Budget**
  - Continuing state budget issues may limit or remove institution resources needed for the P-20W SLDS. The proposal is to utilize money identified for the FY2012 Technology Incentive Grant (TIG) program to fund Phase 1. Phase 1 includes the P-20 SLDS ETL development and provides the public institutions with

funding for their ETL development to provide the necessary data, participation in report development, and reviewing the reports generated.

- **Personally Identifiable Information Release**
  - The P-20W SLDS will contain student level data to allow linking or extraction from multiple data sources. To mitigate the risk of exposing personally identifiable information, this data will be segregated in separate tables that can be secured and the access limited to only the required and approved personnel.
  - To safeguard personally identifiable information, any public information requests will require data extracts of the results by internal resources, aggregation, approval from the Data Management Council and the owning institutions.
    - Discussions will be planned with other state agencies who routinely deal with sensitive information to ensure that the proper safeguards are in place, including system vulnerability patching, tape storage, administration account control, and access logging.
  - MOUs will be developed to manage data extracts for matching to labor data or other data exchanges.

Recommendation

The construction of the P-20W SLDS should be completed over a period of time, through a four-phased approach. It is recommended to first build a P-12 SLDS and separate postsecondary repository (to form the P-20 SLDS). This will allow for the immediate use of the required data pursuant to the ARRA requirements. Then as time and resources allow, incorporate additional data sources, and improve the functionality and use of the SLDS by maturing to a P-20W SLDS. Continuing implementation by adding a Data Warehouse and Decision Support System increases the usability and removes the dependency on technical resources to retrieve information.

Adding additional functionality in a phased approach provides early wins, allows Idaho to meet the Federal ARRA reporting requirements, assist the Board of Education in making progress toward its Strategic Plan objectives, and increases stakeholder satisfaction.

The State Board of Education should be the entity to lead the development of the P-20W SLDS toward a common vision across all of education. It is critical that all Idaho education and labor agencies work together toward a common SLDS goal. In a recent Institute of Education Sciences grant

conference, the consensus was that the biggest obstacles states face is a lack of commitment to find ways to share data. Many states experience constant battles and discussions (often taking years), over data privacy, ownership, and dealing with differing FERPA interpretations that often require legislation or executive order to resolve. The goal of an SLDS is to provide the necessary data for education improvement at all levels. Idaho has an advantage in its unique education governance structure that can allow us to succeed in the timeframe available. The SBOE's role as the policy-making body for all of public education provides an opportunity to eliminate these barriers and streamline the process. However, challenges will remain in aligning the various institutions and agencies towards the common goal of tracking students from the time they enter preschool through entry into the workforce.

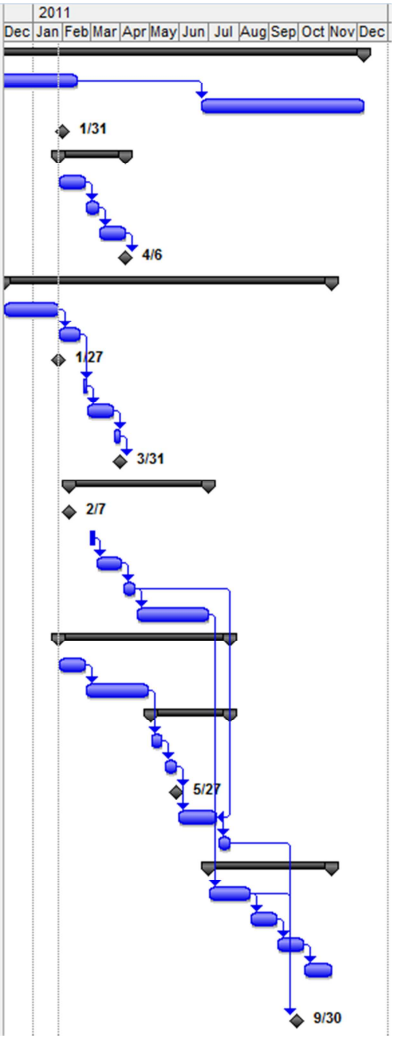
For the SLDS to be built in a timely manner, a commitment is required from all parties involved to make this a priority and to apply the necessary resources to complete tasks when scheduled. The participants required are the State Board of Education, the Office of the State Board of Education, the State Department of Education, the Division of Professional Technical Education, the Department of Labor, possibly the Department of Transportation, the Department of Corrections, all public postsecondary institutions, and if possible, the private and for-profit institutions. Ideally, ample lead time and as much flexibility as possible will be provided when engaging the institutions and departments. However, the reality is that there will be times when the P-20W SLDS will likely need to be given priority over other internal projects and initiatives.

Execution Plan

Phase 1 – Postsecondary Repository and link to K-12 SLDS for P-20 SLDS

Below is a proposed execution plan and timeline for development.

	Task Name	Duration	Start	Finish
1	**P-20 to Workforce SLDS Development**	**308 days?**	**Fri 10/1/10**	**Tue 12/6/11**
2	Establish EDUID in Postsecondary	98 days?	Fri 10/1/10	Tue 2/15/11
3	Pursue EDUID with independent and for-profit institutions	120 days	Wed 6/22/11	Tue 12/6/11
4	Needs Assessment	0 days	Mon 1/31/11	Mon 1/31/11
5	**Establish Data Management Committee**	**50 days**	**Thu 1/27/11**	**Wed 4/6/11**
6	Outline requirements	20 days	Thu 1/27/11	Wed 2/23/11
7	Determine members	10 days	Thu 2/24/11	Wed 3/9/11
8	Develop Charter	20 days	Thu 3/10/11	Wed 4/6/11
9	Schedule Initial Meeting	0 days	Wed 4/6/11	Wed 4/6/11
10	**Phase 1 - Postsecondary Repository**	**241 days**	**Thu 12/2/10**	**Thu 11/3/11**
11	Data Dictionary - ETL templates	40 days	Thu 12/2/10	Wed 1/26/11
12	Incorporate PTE requirements	17 days	Thu 1/27/11	Fri 2/18/11
13	Request travel grant - PEN for OUS	0 days	Thu 1/27/11	Thu 1/27/11
14	Meet with OUS - review templates	3 days	Tue 2/22/11	Thu 2/24/11
15	Develop updated Idaho Data Dictionary	20 days	Fri 2/25/11	Thu 3/24/11
16	Review and Finalize Proposed Data Dictionary	5 days	Fri 3/25/11	Thu 3/31/11
17	Publish Idaho Data Dictionary	0 days	Thu 3/31/11	Thu 3/31/11
18	**SQL Server - Developer**	**104 days**	**Mon 2/7/11**	**Thu 6/30/11**
19	MOA signed	0 days	Mon 2/7/11	Mon 2/7/11
20	Database Instance Created	4 days	Tue 3/1/11	Fri 3/4/11
21	Obtain DBA / Developer	20 days	Mon 3/7/11	Fri 4/1/11
22	Build postsecondary repository tables	10 days	Mon 4/4/11	Fri 4/15/11
23	Develop ETL scripts - P-20 SLDS	54 days	Mon 4/18/11	Thu 6/30/11
24	**Institutions**	**127 days**	**Thu 1/27/11**	**Fri 7/22/11**
25	Meet with each public postsecondary institution	20 days	Thu 1/27/11	Wed 2/23/11
26	Develop ETL scripts from ERP system	47 days	Thu 2/24/11	Fri 4/29/11
27	**Data Load**	**60 days**	**Mon 5/2/11**	**Fri 7/22/11**
28	Run trial extracts from ERP systems	10 days	Mon 5/2/11	Fri 5/13/11
29	Verify data and adjust scripts	10 days	Mon 5/16/11	Fri 5/27/11
30	Initial Data Request	0 days	Fri 5/27/11	Fri 5/27/11
31	Initial Production ETL from ERP systems	30 days	Mon 5/30/11	Fri 7/8/11
32	Initial Data load verified and available	10 days	Mon 7/11/11	Fri 7/22/11
33	**Reports**	**90 days**	**Fri 7/1/11**	**Thu 11/3/11**
34	Develop base set of reports	30 days	Fri 7/1/11	Thu 8/11/11
35	Produce CCA reports	20 days	Fri 8/12/11	Thu 9/8/11
36	Evaluate IPEDS reports	20 days	Fri 9/9/11	Thu 10/6/11
37	Incorporate all applicable OSBE report requests	20 days	Fri 10/7/11	Thu 11/3/11
38				
39	ARRA requirements met	0 days	Fri 9/30/11	Fri 9/30/11



- The EDUID implementation into the postsecondary institutions project is underway with five out of the eight institutions having generated an EDUID for their fall 2010 enrollment of students. The goal is to populate all of the public postsecondary ERP systems with unique student ID's generated via the K-12 EDUID engine by January 31, 2011. OSBE has initiated discussions to include the private institutions in this project. Implementation of the EDUID provides the link necessary between the proposed postsecondary repository and the K-12 system. It also provides the link to produce reports on postsecondary enrollment and remediation needs for first time students who

have graduated from high school in Idaho and are now in Idaho postsecondary institutions, as required by ARRA, SFSF requirements. The cost for this effort is being covered by the institutions.

- Due to the complexity, the short timeframe of the 2011 deliverables, limited resources, and lessons learned from other states, the P-20W SLDS should be implemented in a "building block" phased implementation approach. The potential opportunities to reduce costs by leveraging other states efforts, the fact that the design is not finalized, and that a Request for Proposals would need to be executed to define costs, the Phase 3 and beyond costs should be considered as rough estimates that will be further defined during Phase 2.

- Accept K-12 offer of housing the postsecondary data in a separate instance in the K-12 SQL Server 2008 cluster. SQL Server 2008 supports multiple independent databases (instances) running on the same hardware. The instances are kept logically separated and basically do not know the other instances are running. It is possible to confine each instance to a specific amount of CPU utilization to prevent performance issues. SDE has created a cluster environment which also provides protection from hardware failure, which is a very robust and fault-tolerant solution.

    - Cost: $50K for a developer (with SQL Server DBA experience) and FY 2011 ETL assistance.
        - Outline requirements and acquire a developer with SQL Server expertise
        - Sufficient work to keep a developer busy for at least a year. Requirement for report development would be satisfied by this position.
            - Despite the current labor market, it could be difficult to find resources with the expertise needed in the price-range planned.

    - Advantages
        - SDE's offer to provide the instance minimizes cost.
        - Data would reside on the same hardware as K-12 data –any data transfers and/or linkage to K-12 data would be local.
        - SDE is an education entity under the State Board of Education, and under current interpretation, FERPA allows for this arrangement.
        - SDE's is a secure environment not exposed to the Internet
        - Cost of space will be minimal and is anticipated to be $3,000 or less annually.

- Able to leverage SDE server expertise to build environment.
- Eventually plan to leverage the development used for the K-12 SLDS ETL process to create the postsecondary load scripts.

- Disadvantages
  - Sharing the SQL Server environment adds additional monitoring requirements to SDE regarding CPU utilization, memory, and storage (which is manageable). An MOA is required to define the arrangement.
  - User creation and access processes and procedures will have to be mutually agreed upon.

- Open items:
  - The Support model with SDE needs to be agreed upon with a Memorandum of Agreement (in process) to specify access and responsibility. The intention would be for the SQL Server instance that is set up for postsecondary to be completely isolated and under the control of OSBE and the institutions.
  - The SDE datacenter is on a different network subnet. Would need to determine a solution for directly linking to the server (which is a minor issue).
  - The Oregon University System (OUS) has provided their data load (ETL) templates, which have saved at least six months of research and analysis efforts to define the data elements required. These templates will be reviewed with the institutions and the Division of Professional Technical Education, then modified to provide the data elements necessary to answer the P-20 SLDS critical questions and serve as the required data elements. A trip funded by the U.S. Department of Education through a grant opportunity called the Personnel Exchange Network (PEN) has been requested for OSBE and SDE to meet with the OUS to discuss technical issues, resolve questions, and ensure understanding of their process.
  - Schedule a meeting with the institutions to review the proposed ETL templates and review this plan.
  - Establish the Data Management Council structure for P-20W SLDS. 
  - The transcript system being designed and developed by the P-12 SLDS is scheduled to be operational by September 30, 2011. A meeting of postsecondary admissions was held January 11, 2011, to discuss requirements. The original grant proposal was to develop an electronic transcript system. SDE has changed

direction and is planning on evaluating commercial hosted solutions. The cost for this effort is covered by the current Federal SLDS grant.

- Participate in the WICHE multi-state data exchange pilot to ensure that the SLDS can track students who cross state lines. The result of an exchange includes the ability to compare student performance among states and whether students that transfer out of state in special programs return to the state to join the workforce. Cost is covered by a grant from the Gates foundation and is administered by WICHE.
- There is a need to provide longitudinal data for the Complete College America partnership. Incorporating these requirements with the postsecondary SLDS, reduces the effort required by the institutions.
- Compliance with the reporting requirements of the ARRA America COMPETES Act is scheduled to be completed, or we will have the capacity to meet the requirements, by the September 30, 2011, deadline.

FY2011 Resources and Cost detail (major items)

- $ 50,000 covered by remaining FY2011 TIG funding and SBOE budget
  - Labor – Developer = 560 hours $37,500 (remainder of FY2011)
  - Labor – ETL from postsecondary systems
    - Eight institutions x 320 hours – absorbed by institutions, or covered by FY2011 and FY2012 TIG funds.
- OSBE labor 400 hours - absorbed.
- Meetings and review by institutions – 720 hours - absorbed
- Training - 2days @ each institution x 8 = 128 hours – provided by OSBE
- Project Management – (covered by current TIG)
- Hardware & Software – minimal cost anticipated, less than $5,000
  - SDE has offered to put up an instance in their environment – $3,00 or less anticipated
  - May require purchase of storage estimated not to exceed $1,200
- Travel (absorbed)
- Support – none
- Ongoing support costs:
  - Report Writing – covered by developer
  - Server support - .1 FTE – covered by SDE / OSBE / PTE
  - Data Quality manager – internal resources temporarily leveraged

Phase 2 – Maturing the SLDS environment

(unbudgeted cost $1M, timeframe complete by June 30, 2012)

Phase 1 delivers the P-20 SLDS base functionality, and Phase 2 matures the environment to provide information to stakeholders, delivery of additional reports, transition of most OSBE data needs to the P-20 SLDS, improvements to the ETL process, and development of additional data sources.

- Training and documentation plan developed (320 hours – internal staff)
- Develop automated import leveraging SDE's solutions and implement Memorandum of Understanding / Memorandum of Agreements as necessary to include additional data sources and users (400 hours)
- Determine and develop standard SLDS reports (1 FTE)
- Logical model developed (320 hours - consultant or Institution expertise)
- Database Analyst (1 FTE)
- Preliminary Design of the Postsecondary Data Warehouse (320 hours – consultant or institution expertise)
- Incorporate workforce data and evaluate other outcome data (480 hours)
- Determine hardware requirements
    - Expand SQL Server environment to support the data warehouse if necessary, or deploy a new solution
- Deliverables:
    - Web ETL file submission (based on SDE's source)
    - Reports:
        - Integrate federal reporting
        - Transition reports (K-12 to postsecondary)
        - Analyze existing OSBE data requests and move to SLDS
        - Develop ongoing Federal Reports including
            - Completion of 1st year credits within 2 years
            - Tracking Students who enroll in postsecondary within 16 months of graduation
            - Students who complete 24 credits within first 2 years
            - Update of other ARRA reports
        - Develop reports to answer critical questions from SBOE, institutions, SDE, and the legislature.
    - Design – Data Warehouse
        - Investigate solutions in place in other states
        - Elemental design decisions made – structure and dimensions
        - Determine hardware, software, and support model

FY2012 Resources and Cost (major items)
(pricing based on current state procurement rates for consulting, internal = direct labor + burden + indirect costs)

Recommendation - (assumes allowance for internal labor)

- Data Warehouse Systems Architect - consultant or internal from postsecondary institutions – 960 hours @ $115 = $ 110,400
- Training 640 hours using internal labor @ $50 = $32,000
- Travel $56,000 (3 group meetings and institution visits)
- Grants to public postsecondary institutions to cover ETL development, internal process and documentation changes, automated job scheduling, project management - TBD
- Support costs:
  - Web Developer / Report Writing – 1 FTE for 1 year $104,000
  - Data Quality manager – 1 FTE for 1 year $104,000
  - Project Manager – 1 FTE for 1 year $104,000
  - Database Analyst / SQL Specialist – 1 FTE for 1 year @74.80 $149,600

Phase 3 – Finalize Design and implement a postsecondary Data Warehouse

(unbudgeted cost approximately $1M, timeframe complete by June 30, 2013)

Data Warehouse - The main source of the data is cleaned, transformed, catalogued and made available for use by managers and other business professionals for data mining, online analytical processing, and decision support (Marakas & O'Brien 2009). In the case of education, the Data Warehouse transforms the repository into formats (data marts) that are readily understood by the Institutional Researchers and analysts so they can independently analyze information (within the bounds of the security structure built into the warehouse).

- Determination if P-12 data will be incorporated at this point
- Develop RFP for data warehouse implementation
- Engage institutional experts or consultant to finalize design of the Data Warehouse
- Form committee to determine dimensions and data marts
- Develop data feed (ETL) from data repository to data warehouse
- Hire consultant / leverage institution expertise
- Purchase or leverage Data Warehouse software
- Develop a Business Intelligence roadmap
- Implement solution

FY2013 Resources and Cost (major items)
(pricing based on current state procurement rates for consulting, internal = direct labor + burden + indirect costs)

- Recommendation (implement P-20 SLDS data warehouse) $1 million
  - (assumes allowance for internal labor)
- Data Warehouse Architect Consultant - 240 hours @ $100 = $24,000
- Consulting – data crosswalk analysis, determination of data elements, develop automated load and reports $100,000
- Develop ETL's to populate data warehouse 480 hours @ $75 = $36,000
- OSBE labor –
  - participate in design and verify information - 1,000 hours @ $50 = $50,000
- Additional software and licensing $100,000-$300,000 (plan $200,000)
  - (low end – leverage an existing solution, high – buy new)
- Additional hardware $100,000
  - Server and SAN storage
    - (by continuing to leverage SDE the cost may be reduced by as much as ½, would still have to expand SAN and add additional server blades)
- Support costs:
  - Data Warehouse Reports / queries – 1 FTE for 1 year $104,000
  - Data Quality manager – 1 FTE for 1 year $104,000
  - Project Manager – 1 FTE for 1 year $104,000
  - Database Analyst / SQL Specialist – 1 FTE for 1 year @74.80 $149,600
  - Server support - .25 FTE for 1 year $25,000
- Option – incorporate P-12 SLDS data
  - Add Developer/SQL for ETL development - $125,000

Phase 4 - Transform to P-20W SLDS & Business Intelligence solution

(cost approximately $1.2M, timeframe complete by June 30, 2014)

Business Intelligence (BI) tools allow self-service data query including drill down capability, ad-hoc analysis, and the ability to provide public access to aggregated data that is meaningful and productive. This expands the scope of the P-20W SLDS

to include predictive techniques that will guide educators in optimizing the students achievement.

- Expand storage if required
- Gather requirements and determine solutions
- Review solutions deployed by institutions and SDE
- Develop legislation if required
- Develop and implement additional MOUs necessary to include additional data sources and users
- Develop training and support model
- Research and procure business analytics software
- Deliver training on BI tools and additional predictive analytics
- Expand storage if required
- Develop analytics reports and security model

FY 2014 Resources and Cost (major items)
(pricing based on current state procurement rates for consulting, internal = direct labor + burden + indirect costs)

- Recommendation – add Business Intelligence tools to the data warehouse $1.2 million
- Leverage the Decision Support System from another state to base load the capabilities similar to what SDE did for K-12 SLDS. SDE's successful implementation of the K-12 DRS was based on using Nebraska's consultant to assist in installing the base solution. SDE had over an 80% match rate on fields, which made having the system operational in a very short time period reasonable.
- Evaluate other states decision reporting systems and determine a solution
- Decision Support System Consultant 500 hours @ $100 = $50,000
- Programmers – modify DRS to match fields 480 hours @ $75 = $36,000
- OSBE internal labor – 1,000 hours @ $50 = $50,000
- Business Intelligence software and licensing $100,000 to $500,000.
- Ongoing support costs:
    - Decision Support Expertise – 1 FTE for 1 year $104,000
    - Data Quality manager – 1 FTE for 1 year $104,000
    - Project Manager – 1 FTE for 1 year $104,000
    - DBA – 1 FTE for 1 year @74.80 $149,600
    - Server support - .25 FTE for 1 year $25,000

References

1. **US Department of Education site visit draft report– August 2010**
2. **http://searchsecurity.techtarget.com/sDefinition/0,,sid14_gci1366036,00.html**