

**U.S. Department of Education**

Washington, D.C. 20202-5335



**APPLICATION FOR GRANTS  
UNDER THE**

**Statewide, Longitudinal Data Systems**

**CFDA # 84.372A**

**PR/Award # R372A120012**

**Grants.gov Tracking#: GRANT11025973**

OMB No. , Expiration Date:

Closing Date: Dec 15, 2011

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This application was generated using the PDF functionality. The PDF functionality automatically numbers the pages in this application. Some pages/sections of this application may contain 2 sets of page numbers, one set created by the applicant and the other set created by e-Application's PDF functionality. Page numbers created by the e-Application PDF functionality will be preceded by the letter e (for example, e1, e2, e3, etc.).

**Application for Federal Assistance SF-424**

\* 1. Type of Submission:

- Preapplication  
 Application  
 Changed/Corrected Application

\* 2. Type of Application:

- New  
 Continuation  
 Revision

\* If Revision, select appropriate letter(s):

\* Other (Specify):

\* 3. Date Received:

12/14/2011

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

**State Use Only:**

6. Date Received by State:

7. State Application Identifier:

**8. APPLICANT INFORMATION:**

\* a. Legal Name:

Montana Office of Public Instruction

\* b. Employer/Taxpayer Identification Number (EIN/TIN):

810302402

\* c. Organizational DUNS:

8095887000000

**d. Address:**

\* Street1:

1227 11th Avenue

Street2:

\* City:

Helena

County/Parish:

Lewis & Clark

\* State:

MT: Montana

Province:

\* Country:

USA: UNITED STATES

\* Zip / Postal Code:

59601-3910

**e. Organizational Unit:**

Department Name:

Office of Public Instruction

Division Name:

Office of State Superintendent

**f. Name and contact information of person to be contacted on matters involving this application:**

Prefix:

Ms.

\* First Name:

Madalyn

Middle Name:

J

\* Last Name:

Quinlan

Suffix:

Title:

Chief of Staff

Organizational Affiliation:

Montana Office of Public Instruction

\* Telephone Number:

406-444-3168

Fax Number:

406-444-2893

\* Email:

mquinlan@mt.gov

**Application for Federal Assistance SF-424**

**\* 9. Type of Applicant 1: Select Applicant Type:**

A: State Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\* Other (specify):

**\* 10. Name of Federal Agency:**

U.S. Department of Education

**11. Catalog of Federal Domestic Assistance Number:**

84.372

CFDA Title:

Statewide Data Systems

**\* 12. Funding Opportunity Number:**

ED-GRANTS-092011-001

\* Title:

Institute of Education Sciences (IES): Statewide, Longitudinal Data Systems Program CFDA Number 84.372A

**13. Competition Identification Number:**

84-372A2012

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

Add Attachment

**\* 15. Descriptive Title of Applicant's Project:**

Career and College Ready Montana

Attach supporting documents as specified in agency instructions.

Add Attachments

**Application for Federal Assistance SF-424**

**16. Congressional Districts Of:**

\* a. Applicant

b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

**17. Proposed Project:**

\* a. Start Date:

\* b. End Date:

**18. Estimated Funding (\$):**

\* a. Federal

\* b. Applicant

\* c. State

\* d. Local

\* e. Other

\* f. Program Income

\* g. TOTAL

**\* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

a. This application was made available to the State under the Executive Order 12372 Process for review on

b. Program is subject to E.O. 12372 but has not been selected by the State for review.

c. Program is not covered by E.O. 12372.

**\* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

Yes  No

If "Yes", provide explanation and attach

**21. \*By signing this application, I certify (1) to the statements contained in the list of certifications\*\* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances\*\* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

\*\* I AGREE

\*\* The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**Authorized Representative:**

Prefix:  \* First Name:

Middle Name:

\* Last Name:

Suffix:

\* Title:

\* Telephone Number:  Fax Number:

\* Email:

\* Signature of Authorized Representative:  \* Date Signed:

## ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

|  |   |
|--|---|
| * SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL<br><br>Julia Dilly     | * TITLE<br><br>Superintendent of Public Instruction |
| * APPLICANT ORGANIZATION<br><br>Montana Office of Public Instruction | * DATE SUBMITTED<br><br>12/14/2011                  |

Standard Form 424B (Rev. 7-97) Back

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## CERTIFICATION REGARDING LOBBYING

### Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

### Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

If any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions. Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

**\* APPLICANT'S ORGANIZATION**

Montana Office of Public Instruction

**\* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE**

Prefix: Ms. \* First Name: Denise Middle Name:

\* Last Name: Juneau Suffix:

\* Title: Superintendent of Public Instruction

\* SIGNATURE: Julia Dilly

\* DATE: 12/14/2011



SUPPLEMENTAL INFORMATION  
REQUIRED FOR  
DEPARTMENT OF EDUCATION GRANTS

**1. Project Director:**

Prefix: \* First Name: Middle Name: \* Last Name: Suffix:

Ms. Madalyn J Quinlan

Address:

\* Street1: 1227 11th Avenue

Street2:

\* City: Helena

County: Lewis & Clark

\* State: MT: Montana

\* Zip Code: 59601-3910

\* Country: USA: UNITED STATES

\* Phone Number (give area code) Fax Number (give area code)

406-444-3168 406-444-2893

Email Address:

mquinlan@mt.gov

**2. Applicant Experience:**

Novice Applicant  Yes  No  Not applicable to this program

**3. Human Subjects Research**

Are any research activities involving human subjects planned at any time during the proposed project Period?

Yes  No

Are ALL the research activities proposed designated to be exempt from the regulations?

Yes Provide Exemption(s) #:

No Provide Assurance #, if available:

**Please attach an explanation Narrative:**

## Abstract

The abstract narrative must not exceed one page and should use language that will be understood by a range of audiences. For all projects, include the project title (if applicable), goals, expected outcomes and contributions for research, policy, practice, etc. Include population to be served, as appropriate. For research applications, also include the following:

- Theoretical and conceptual background of the study (i.e., prior research that this investigation builds upon and that provides a compelling rationale for this study)
- Research issues, hypotheses and questions being addressed
- Study design including a brief description of the sample including sample size, methods, principals dependent, independent, and control variables, and the approach to data analysis.

[Note: For a non-electronic submission, include the name and address of your organization and the name, phone number and e-mail address of the contact person for this project.]

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## You may now Close the Form

**You have attached 1 file to this page, no more files may be added. To add a different file, you must first delete the existing file.**

\* Attachment:

## 5. ABSTRACT

**Title:** College and Career Ready Montana

**Priority:** Priority #3: Postsecondary Data

**Additional State Agency Responsible for Grant Activities:** Montana University System

**Project Description:** The Montana Office of Public Instruction (OPI) requests \$3,977,861 over three years for implementation of *College and Career Ready Montana* under Priority # 3 of the *Statewide, Longitudinal Data Systems Grant for FY 2012* to link the OPI's K-12 data warehouse and the Montana University System (MUS) postsecondary data warehouse.

We like to believe that our students are college and career ready, but the fact is, we aren't sure. We are lacking access and linkages to longitudinal student transcript data that can help us design accurate solutions to help ensure student success. This grant will support three key goals:

Goal #1: Establish data linkages between K-12 and postsecondary partners by creating an electronic student transcript repository for K-12 education. Under its 2009 SLDS grant, the OPI is completing a K-12 data warehouse and associated tools. The next set of data that the OPI intends to collect and store is student-level transcript information, including information on courses completed and grades earned. This will facilitate the exchange of transcript information between qualified entities.

Goal #2: Create an Interagency K-20 Data Governance Council. This proposal expands on the data governance structure developed for the K-12 data warehouse. Correct and appropriate use and interpretation of data for K-20 analysis can be ensured only if both owners and users of data possess a shared understanding of the meaning and representation of the data. Key to this effort is the creation of data governance structures to guide data collection, sharing, and use. An interagency K-20 Data Governance Council will be created to lead and guide this effort.

Goal #3: Implement business intelligence and web reporting tools for users of K-20 data. Business Intelligence tools will facilitate state and federal reporting; provide more accurate, consistent data; and allow the various stakeholders to track groups of students and learn how the educational services they have received have contributed to their success.

The OPI will expand OPI's K-12 warehouse to link K-12 data and establish interoperability with the MUS system, primarily through development of a standard transcript that can be compared and used by all units of the university system. These data will then be combined with postsecondary transcript information so that schools can be informed regarding the quality and performance of curricula with respect to college readiness. The K-12 data warehouse will be expanded to house the additional data and provide reports and dashboards. The OPI will help the LEAs extract the data from their legacy systems, and design and implement an electronic student records and transcript exchange, with data from the LEAs and MUS flowing to the OPI.

The deliverables, tied to the Priority #3 requirements, are to form a project and data governance structure, plan, and systems; provide data research analyst and business analyst positions; produce accessibility documentation; establish procedures to ensure data integrity, security, and quality; train users how to accurately enter data; establish procedures to monitor the accuracy of data entering the system; provide staffing to help validate data, ensure accuracy, and generate reports; create the exchange mechanism with the MUS; collect and validate data from the K-12 districts; develop transport and validation mechanisms to move data from LEAs to the OPI; deliver K-12 transcript to universities; establish secure access; develop and provide training on the use of data tools and products; develop a professional development module for data interpretation and application; secure an outside evaluator; and establish research partnerships.

## Project Narrative File(s)

---

\* Mandatory Project Narrative File Filename:

---

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File

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## 6. PROJECT NARRATIVE

### (a) Need for Project

#### **Introduction**

Montana looms large in American mythology as *the last best place*, a place where rugged individualism prevails and folks live an enviable life unfettered by too much progress, bureaucracy, or government. While the fantasy may be fairly harmless for people who don't live here, it can pose tremendous obstacles that only add to the challenges of extreme distance, lack of transportation options, low income, and general frontier-state living that many Montana students face daily.

We like to believe that our students are college and career ready, but the fact is, we aren't sure. Despite numerous supports from the middle-school to postsecondary level, too many low-income, first generation, and minority students are not succeeding in college and don't have the desired skills and experience to enter the workforce. Superintendents, principals, parents, and students are desperate to know what went wrong and how to correct it. We are lacking access and linkages to longitudinal student transcript data that can help us understand which students are enrolling in postsecondary education and where students struggle and where they thrive so that we can design accurate solutions to help ensure student success. While demand for data is high, because of significant challenges in balancing the state budget, legislative funding to create the systems to identify, gather, analyze, and report meaningful data has been insufficient to completely meet the need.

Montana is a local-control state, which presents challenges for any centralized activity. Further complicating our efforts to implement statewide, longitudinal data systems to inform educational policy decisions is the constitutional separation of our K-12 and postsecondary education systems. The **Montana Office of Public Instruction (OPI)** is responsible for K-12 education and operates under the leadership of an elected Superintendent of Public Instruction and a seven-member Board of Public Education appointed by the Governor and approved by the Senate. OPI works with 417 school districts (more than 200 of which serve fewer than 100 students each) serving nearly 142,000 K-12 students enrolled in public education. The **Montana University System (MUS)**, which includes 14 universities and colleges serving more than 47,000 students, is the responsibility of the Board of Regents and its appointed Commissioner of Higher Education, housed in the Office of the Commissioner of Higher Education (OCHE).

#### **History and Status of the Current Data Systems**

The Montana Constitution, Article X, Section (1)(c) states "The legislature shall provide a basic system of free quality public elementary and secondary schools." In 2005, the Montana legislature passed Senate Bill 152 to define a *basic system*, including a procedure to assess and track student achievement in the educational programs, and appropriated funding to create a statewide student information system to serve as the foundation of a statewide longitudinal data system for k-12 education.

The Montana legislature has provided funding for the statewide student information system, the state's educator information systems, including resources to update of the state's educator

licensure system (scheduled for completion in the spring of 2012), and the system for collecting master schedules, personnel assignments, and course offerings from school districts (scheduled for implementation during the 2012-13 school year).

In 2010, the Superintendent of Public Instruction, Commissioner of Higher Education, Board of Regents, Board of Public Education and the legislature’s Education and Local Government Committee completed a 15-month process for establishing Shared Policy Goals and Accountability Measures and adopted four goals detailed on page 13 of this proposal. Each adopted goal includes a set of objectives and accountability measures, which depend on valid, reliable, and robust data systems for their attainment. (See *Appendix A* for the Shared Policy Goals document.)

In 2011, the Montana legislature approved Senate Joint Resolution 26, which requested interim monitoring (Montana’s legislature is in session for 90 days every odd-numbered year, thus the need for interim activity) of K-12 education and progress on implementing state actions to create a culture of effective data use and to improve student performance. In the seven months since the legislative session ended, the OPI has made three presentations to the interim committee on the goals, objectives, and status of the state’s education data systems. The OPI is using the Data Quality Campaign’s 10 State Actions to Support Effective Data Use to assess its progress and to report to the committee. (See *Appendix A* for OPI’s Data Quality Campaign progress report.)

The Superintendent of Public Instruction and the Commissioner of Higher Education convene a joint meeting of their leadership teams on a regular basis (three to four times per year) to discuss topics related to the P-20 education pipeline, transitions from K-12 to postsecondary, and ways to provide mutual support for P-20 initiatives. Regular topics include the State Superintendent’s Graduation Matters Montana initiative, the adoption of the common core state standards, dual enrollment and dual credit options, measures of college participation and success, and the information systems to support these efforts. Both the Superintendent of Public Instruction and the Commissioner of Higher Education recognize the importance of a strategic investment in collection, management, and use of data to measure the success of our P-20 education systems.

*OPI Data System*

In 2011, the Montana legislature established Pathway to Excellence (Montana Code Annotated 20-7-103 and 104) to promote education excellence in Montana’s public schools through data-driven decision making with the intent that Montana K-12 public education maintains a focus on continuous improvement and increased academic achievement for public school students. The OPI was directed to establish a publicly available data system that displays an educational data profile for each school district that includes, at a minimum:

- Contact information and a link to the district website
- State criterion-referenced testing (CRT) results
- Program and course offerings
- Student enrollment and demographics by grade level
- Graduation rates

The OPI implemented a statewide student information system, AIM (Achievement in Montana) in the 2006-07 school year. At the first point of contact with the public school system, each

student is assigned a unique statewide student identifier (SSID) that does not permit a student to be individually identified by users of the system. The Board of Public Education mandates that this unique student identifier be included on the student's permanent record. Using AIM, the OPI collects student-level enrollment, demographic, and program participation information. Student-level information about points at which students exit, transfer in, transfer out, drop out, or complete P-12 education programs is maintained in AIM. The agency stores the yearly test records of individual students with respect to assessments and information on students not tested by grade and subject. The OPI also has a basic data audit system assessing data quality, validity, and reliability within the AIM system.

The Montana Office of Public Instruction was awarded a 2009 SLDS grant to establish its K-12 education data warehouse, Growth and Enhancement of Montana Students (GEMS), and implement a data governance structure within the OPI, which is on track for completion in December 2012. (As part of its SLDS site visit in October 2010, the U.S. Department of Education recognized our strengths around policies, processes, capacity considerations, stakeholder buy-in and partnership, sustainability, knowledge transfer, and data validation.) The grant is facilitating the migration of data within the OPI's numerous legacy systems to the new data warehouse and providing resources for the OPI to implement business intelligence tools for use by a broad community of users. When completed, GEMS will provide access to multiple years of longitudinal data in order to track school and student information across time; remove barriers to obtaining data in a usable form for decision makers; and store all data collected by the OPI to provide an effective, timely, and efficient approach to analyze student and school performance.

#### Montana University System Data System

The Montana University System maintains a student unit record-level longitudinal data warehouse containing enrollment, course information, and graduation data of students enrolled in state-sponsored postsecondary education in Montana. This rich set of data includes student demographics, assessment outcomes, course grades, and instructors, as well as the ability to track transfers between MUS institutions and the ability to track cohorts of students over time. The Board of Regents mandates collection of all Montana high-school transcripts. The Office of the Commissioner of Higher Education maintains the warehouse and supplies the campuses with reporting and critical analysis tools. The Montana Board of Regents uses this information system to assess critical performance indicators and key measures within its strategic plan. The warehouse includes data from 2001 forward and is supported by two full-time employees. The MUS also has developed a data sharing agreement with the Montana Department of Labor and Industry that enables the agencies to track the workforce outcomes of MUS graduates. A Memorandum of Understanding with the Department of Labor and Industry in place since 2007 provides the MUS with access to past and current Unemployment Insurance (UI) wage records. Because of this linkage, the MUS has been able to analyze the percentage of graduates who find employment in Montana, the level of wages they command, and the industries employing them.

#### **Project Goals**

This grant will support three key goals of the K-20 SLDS project.

Goal #1: Establish data linkages between K-12 and postsecondary partners by creating an electronic student transcript repository for K-12 education



For several years a significant portion of the public policy discussions about how well Montana's education system is performing has been focused on transitions and career and college readiness. In the transition from K-12 to postsecondary, Montana's educational policymakers are interested in raising college continuation rates (the percentage of students that enrolled in college somewhere in the United States during the fall following high-school graduation), college retention rates, and college graduation rates. A key factor in improving these rates is to know how well K-12 public schools are preparing students for postsecondary coursework. For example, in the fall of 2010, of the recent Montana high-school graduates attending the MUS, 29.3% were enrolled in at least one remedial math or writing course.

To address these questions, Montana needs data systems with the capacity to link data across time and programs. An electronic student transcript repository for K-12 education that leverages previous investments in data systems is the most logical and cost-effective approach.

Under its 2009 SLDS grant, the OPI is completing a K-12 data warehouse and associated tools. The next set of data that the OPI intends to collect and store is student-level transcript information, including information on courses completed and grades earned. This will allow us to facilitate the exchange of transcript information between qualified entities.

The information associated with the transcripts also is an important component of the K-20 SLDS and can assist decision-makers in assessing state and local efforts to increase student performance and career readiness.

Goal #2: Create an Interagency K-20 Data Governance Council

This proposal expands on the data governance structure developed for GEMS, which establishes a strong, engaged OPI Governance Board and system to oversee data for the OPI and local education agencies. The K-20 SLDS links the K-12 data system with the MUS system. Correct and appropriate use and interpretation of data for K-20 analysis can be ensured only if both owners and users of data possess a shared understanding of the meaning and representation of the data. Key to this effort is the creation of data governance structures to guide data collection, sharing, and use. An interagency K-20 Data Governance Council will be created to lead and guide this effort.

Goal #3: Implement business intelligence and web reporting tools for users of K-20 data

Business Intelligence (BI) tools will facilitate state and federal reporting; provide more accurate, consistent data; and allow the various stakeholders to track groups of students and learn how the educational services they have received have contributed to their success.

Timely and accurate data and the powerful analyses made possible by the BI tools will be invaluable for the State Superintendent and the OPI, the Governor and the legislature, the Montana Board of Public Education (K-12), boards of trustees, administrators, and teachers. These reports and analyses will assist in policy and resource allocation decisions as well as an overall ability to determine what is providing value to the education system, industry, and the workforce. These tools will ultimately be the basis to driving Montana's economic future by

equipping leaders and decision-makers with the right information at the right time and in the right forum.

**Priority #3 Required Capabilities and Key Elements to Be Developed**

The Office of Public Instruction and its partners have chosen Priority #3, *Postsecondary Data*.

The following table identifies which requirements are in place in Montana’s OPI GEMS system and the MUS system and describes the proposed K-12/postsecondary linked systems and the key elements to be developed.

| <b>Governance and Policy Requirements</b>  |   |  |  |
|--|---|--|--|
| <b>Requirement</b>   | <b>GEMS</b>   | <b>MUS</b>   | <b>K-20 Linked</b>   |
| <u>Need and Uses:</u><br>address the State’s key postsecondary education policy questions; provide data and data-use tools for decision-making at multiple levels  | The data system addresses the State’s key K-12 education questions. It provides data and data use tools that can be used in education decision-making at multiple levels.                                     | The data system addresses the State’s key postsecondary education questions. It provides data and data use tools that can be used in education decision-making at multiple levels. | The linked data systems will meet this requirement by enabling a detailed measurement of college readiness. The project will use tools from the GEMS project to provide three levels of reporting capabilities: pre-prepared static reports, reports that are configurable, and ad-hoc analysis. |
| <u>Governance:</u> include a clearly-articulated governance structure including representatives from key postsecondary organizations, including postsecondary institutions; have clearly defined roles and responsibilities to manage collection, maintenance, and sharing of post-secondary data with K-12 system and the use of those data; identify the entities responsible for operation of the SLDS and include a common understanding | As part of the GEMS project, the OPI has developed a clearly articulated governance system, which includes clearly defined roles and responsibilities to manage collection, maintenance, and sharing of data. | The Office of the Commissioner of Higher Education manages a data governance system that contains representatives from each institution within the MUS.                            | The OPI will be responsible for the operation of the linked data systems. One of our project goals is to create a representative Data Governance Council to perform the identified governance tasks.   |

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| <p>of data ownership, management, confidentiality, and access; provide means to resolve differences among partners.</p>  |   |  |  |
| <p><u>Institutional Support:</u> include support from relevant stakeholders (including support from the agency providing a State WDQI grant if applicable); include authorization to develop and implement connections across the K-12 SLDS and post-secondary systems; commit necessary staff and other resources</p> | <p>As demonstrated by our letters of support (see <i>Appendix B</i>) and legislation described above, the OPI has strong institutional support from relevant stakeholders within and outside the agency. The system is staffed by four full-time qualified employees with data warehouse expertise.</p> | <p>The Board of Regents’ Strategic Plan emphasizes a three-pronged approach to improving information technology focusing on integrating information systems, improving network connectivity, and developing data warehouses to create a more effective and efficient system. The system is staffed by two full-time employees with data warehouse expertise.</p> | <p>Section 20-7-104, MCA requires the development and implementation of longitudinal data systems to match student level K-12 and higher education data. Development and implementation of connections across the K-12 and postsecondary data systems also is part of the Board of Regents strategic plan. The OPI GEMS data team will transition to the K-20 system, but additional personnel are needed, as described in Section (e) Staffing. Montana does not have a WDQI grant.</p> |
| <p><u>Sustainability:</u> Demonstrate ongoing support from SLDS partners for, at a minimum, system maintenance, quality control, and user training</p>   | <p>The OPI commits ongoing staff and other resources for the minimum system requirements of system maintenance, quality control, and user training.</p>   | <p>The MUS commits ongoing staff and other resources for the minimum system requirements of system maintenance, quality control, and user training.</p>  | <p>This project builds upon tools and processes that are already in place for the GEMS project. The Microsoft suite of products provides for low cost of ownership and uses a well understood toolset. This allows for significant customization without the need to engage a third party. The warehouse will leverage the existing expertise of the GEMS staff, providing an in-house group who understand how to modify the system.</p>  |

| <b>Technical Requirements</b>  |   |  |   |
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| <b>Requirement</b>   | <b>GEMS</b>   | <b>MUS</b>   | <b>K-20 Linked</b>  |
| <p><u>Privacy Protection and Data Accessibility</u>: ensure the confidentiality of individual data; include public documentation that defines data accessibility</p> | <p>To protect individual student data, the OPI has adopted a Student Records Confidentiality Policy that complies with FERPA, state laws, and federal education programs administered by the OPI. The system includes public documentation that clearly articulates what data is accessible, to which users, and for what purposes.</p> | <p>To protect individual student data The MUS has adopted policies that comply with FERPA, state laws, and federal education programs administered by the MUS. The system includes public documentation that clearly articulates what data is accessible, to which users, and for what purposes.</p> | <p>The linked data systems will include reports and tools that are controlled by a secure system that ensures student confidentiality, while granting access to individuals who have a legitimate educational reason for accessing the data. The data available for analysis will include all the data currently in the K-12 data warehouse as well as additional data proposed to be collected as part of this grant (K-12 transcripts and higher education data as described in <i>Appendix A</i>.) Data imported into the linked system from the MUS will not be personally identifiable. The combined system will protect the confidentiality of individual data, consistent with the requirements of FERPA and other State laws and policies concerning confidentiality of individual student records. The Data Governance Council will update the GEMS public documentation that clearly articulates what combined system data are accessible, to which users, and for what purposes.</p> |
| <p><u>Data Quality</u>: ensure the integrity, security, and quality of data; include an ongoing plan for</p>   | <p>The OPI has established procedures to ensure the integrity, security, and quality of the GEMS</p>  | <p>The MUS has established procedures to ensure the integrity, security and quality of the system data.</p>  | <p>A Data Governance Council will be appointed to 1) establish procedures to ensure the integrity, security and quality of the</p>  |

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| <p>training those entering or using the data; include procedures for monitoring the accuracy of the information</p>  | <p>data. Funding is in place to train school personnel on data quality practices to ensure the quality of data that are imported into the warehouse. Procedures are in place for monitoring the accuracy of data entering GEMS.</p> | <p>Data are entered by trained professionals in the Admissions and Records Office at each campus. Procedures are in place for monitoring the accuracy of data entering the system.</p> | <p>system data 2) train individuals who use the data; and 3) establish procedures for monitoring the accuracy of data entering the system. (There is no new data entry into the linked system. It leverages the processes already in use by OPI and the MUS.) This grant will support additional staff (see <i>Section (e) Staffing</i>) who understands both data sets to help design and present training.</p>  |
| <p><u>Interoperability:</u> use a common set of data elements with common data standards to allow interoperability and comparability of data; at a minimum, link postsecondary data system to the State’s K-12 SLDS with a mechanism established for ongoing data exchange</p> | <p>GEMS uses K-12 statewide student identifiers (SSID) and maps fields to the Common Education Data Standards (CEDS).</p>   | <p>The MUS collects the K-12 statewide student identifier (SSID) and uses the Classification of Instructional Programs (CIP) codes.</p>  | <p>See <i>Appendix A</i> for a graphic of proposed interoperability of the linked data systems. The linked data systems will adhere to the data model established by the OPI. This grant will support the processes and information technology to create the exchange mechanism with the MUS and collect and validate the data required for analysis; collect and validate the data required for analysis from the K-12 districts; develop the transport mechanism to move data from LEAs to the OPI; establish electronic delivery of the K-12 transcript to Montana universities; and produce useful, actionable reports.</p> |
| <p><u>Enterprise-wide Architecture:</u> include an enterprise-wide data architecture that links records across</p>   | <p>The OPI has developed an enterprise-wide architecture with the GEMS project for K-12 education. The</p>  | <p>The MUS has created a data model that supports future linkages to K-12 allowing longitudinal</p>  | <p>The link between the K-12 and higher education systems is the Statewide Student Identifier (SSID). The SSID is collected in the higher education</p>   |

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| <p>information systems and data elements across time and allows for longitudinal analysis; include at a minimum a system for assigning unique student identifiers, data dictionary, data model, and business rules</p> | <p>GEMS data model is scalable to allow linkages to post-secondary information systems.</p> | <p>analysis.</p> | <p>system when student information is captured from the transcript. Within the linked data systems, the SSID will be the primary key that will allow analysis over time. The GEMS system includes a metadata repository that will be used to provide the data dictionary and documentation of business rules. The data model used for GEMS will be updated with the additional information collected from higher education and the school districts.</p> |
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| <b>Data Use Requirements</b>   |  |  |  |
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| <b>Requirement</b>   | <b>GEMS</b>  | <b>MUS</b>   | <b>K-20 Linked</b>   |
| <p><u>Secure Access to Useful Data for Key Stakeholder Groups:</u> provide appropriate and secure access to key stakeholder groups; balance access with privacy protection and confidentiality</p> | <p>The OPI controls access to GEMS by assigning user roles. This allows the system to restrict access to confidential data to only those individuals who have both a need to see the data (the role) and a direct relationship to the students. Data are provided at an aggregate level to all interested parties, subject to the OPI’s Student Confidentiality Policy. Access to unmasked or personally identifiable data is restricted to those who have a legitimate educational need to see the information.</p> | <p>Secure access to MUS data is role-based and controlled by the Office of the Commissioner of Higher Education. Data are provided in the aggregate level on reports located at <a href="http://www.mus.edu">www.mus.edu</a></p> | <p>The Data Governance Council will develop policy to determine access to the data using role-based security. The OPI and the MUS will implement the policy in conjunction with existing policies that protect student and family privacy. Access to unmasked or personally identifiable data will be restricted to those who have a legitimate educational need to see the information.</p> |

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| <p><u>Data Use Deliverables:</u> include reporting and analysis tools; ensure early and sustained engagement of representatives of user groups to identify information needs and recommend improvements</p> | <p>GEMS contains a full suite of Business Intelligence tools, including standard reports and adhoc queries. The OPI regularly convenes a stakeholder advisory committee, which provides input on design, information needs, and areas of improvement. The advisory group also helps design a local district portal, which will allow them to import and analyze their own district data.</p> | <p>The MUS utilizes a variety of reporting and analysis tools, including standardized reports in MS Access. Data liaisons from each campus meet regularly to identify information needs and improvements.</p> | <p>The Data Governance Council will engage representatives of user groups to identify information needs and improvements. Data use deliverables may include K-12 feedback, post-secondary feedback, and consumer information reports and dashboards as defined by the Data Governance Council that can be used to evaluate the performance of Montana students and their readiness for higher education. In addition, the evaluator will engage representatives of user groups in recommending improvements to data use deliverables.</p> |
| <p><u>Training on the Use of Data Tools and Products:</u> include a professional development program to prepare end-users to effectively use data-use products</p>  | <p>The OPI has hired a temporary employee to produce training content and materials for an on-line learning management system.</p>   | <p>The MUS provides orientations and on-the-job training to prepare end-users to use its data products, including front-end reporting training on MS Access and other reporting tools.</p>                    | <p>We envision a multi-faceted approach to training end users, including face-to-face training, on-line resources such as FAQs, computer-based training, and on-line real-time training to train both on the data and the use of the tools. This grant will support modification of the on-line learning management system and user training.</p>   |
| <p><u>Professional Development on Data Use:</u> include a professional development program to help end-users effectively interpret and apply data to inform</p>   | <p>The GEMS website will include a module dedicated to helping end-users interpret and apply data and will include metadata to describe individual elements as well as metrics</p>   | <p>The MUS promotes professional development through periodic meetings with campus end users to improve data utilization.</p>   | <p>The linked K-20 data systems’ website will include a module dedicated to helping end-users interpret and apply data and will include metadata to describe individual elements as well as metrics defining cohorts, success,</p>  |

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| <p>decision making and improve practices</p>   | <p>defining cohorts, success, attendance, attrition, retention, etc. Information on interpretation and application also will be included in the packaged electronic learning management system and in system policy documents. Guidance also will be available through help-desk support provided by the business analyst and data research analyst.</p> |   | <p>attendance, attrition, retention, etc. Information on data interpretation and application also will be included in the packaged electronic learning management system and in system policy documents. Guidance also will be available through help-desk support provided by the business analyst and computer systems analyst. Face-to-face training will be provided to key end users as described in <i>Section (c) Project Timeline</i>. This grant will support development and implementation of professional development.</p> |
| <p><u>Evaluation of Data Products, Training, and Professional Development</u>: include a process for evaluating the effectiveness of data-use deliverables and training and development programs</p> | <p>OPI will pilot an electronic learning management system during the December 2012 rollout of the GEMS system. The training will include the ability to administer tests and to monitor how those who take the training perform on the test.</p>  | <p>The MUS seeks regular feedback from campus liaisons and data end users in an effort to evaluate data products and training.</p>                              | <p>The linked K-20 data systems will use the GEMS electronic learning management system, which includes the ability to administer tests and to monitor how those who take the training perform on the test. This grant will support an independent evaluator who will design and implement a participatory, continuous improvement evaluation model for data-use deliverables and training and development programs.</p>   |
| <p><u>Partnerships with Research Community</u>: have a policy in place for processing requests for data for research purposes and communicating the</p>  | <p>The OPI uses its system data for in-house research (e.g., Indian achievement gap, whole school improvement) and provides data to others such as</p>   | <p>FERPA defines the process by which the MUS will release data for research purposes. Researchers are required to sign the student confidentiality policy.</p> | <p>Most research in Montana is done by the University of Montana or Montana State University (and individual graduate students working to complete theses). Measured Progress, the OPI's testing</p>   |



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| <p>scope of available data; establish partnerships to assist in answering questions that can inform policy and practice; actively disseminate research and analysis findings to the public while ensuring confidentiality of individual student data</p> | <p>Upward Bound, Measured Progress (OPI’s testing vendor), and individual researchers. The Student Record Confidentiality Policy defines the process by which the OPI will release data for research purposes.</p> | <p>Data are released by individual campuses or on a system-wide basis by OCHE.</p>                                       | <p>vendor, also uses Montana data for research. The Data Governance Council will identify additional research partners. This grant will support at least one annual statewide conference where K-12 and post-secondary educators will discuss best practices, research results, and policy implications.</p>  |
| <p><u>Sustainability Plan:</u> include a plan for sustaining the deliverables and training beyond the life of the grant</p>  | <p>GEMS has a low cost of ownership. The existing staff will be able to maintain the current K-12 deliverables.</p>  | <p>The MUS data warehouse operations are part of the OCHE base budget. The MUS can sustain its current deliverables.</p> | <p>The linked data systems will use the existing K-12 warehouse, which has a low cost of ownership. It is expected that the existing staff will be able to maintain the deliverables beyond the life of this grant. The training provided during this grant will be a mix of live sessions and computer-based materials. The live sessions will be recorded and archived on the OPI web site for future use. The computer-based materials will also be retained on the OPI web site and learning management system. The OPI and MUS will develop a joint funding request for presentation to the Montana legislature to fully sustain this project.</p> |

**Support for State Education Improvement Efforts, Goals, and Accountability Systems**  
*America COMPETES Act:* The K-20 data system seeks to fulfill the twelve data elements required by section 6401(e)(2)(D) of the America COMPETES Act. (See *Attachment A* for chart.)

The OPI has made significant progress for data element #8, assigning a teacher identifier with the ability to match teachers to students and data element #10, obtaining and storing student-level college readiness test scores. **The one element that Montana has not found the resources to implement for its longitudinal data system is data element #9 – Student-level transcript information, including information on courses completed and grades earned.**

In 2009, the OPI presented an unsuccessful general fund budget request to the Montana legislature for electronic student transcripts. While the education appropriation committee was receptive to the concept, the Montana legislature was unwilling to fund new proposals when faced with significant challenges in balancing the state budget in the wake of the recession. Without an identified funding source for the design and implementation of an electronic student records and transcript exchange, the OPI and its postsecondary partners have not been able to move forward with electronic student transcripts.

With this grant, the OPI and OCHE will be able to build the linkages that will allow Montana educators, policymakers, and researchers to answer questions about career and college-readiness in a meaningful way. As proposed in this application, electronic student record and transcript exchanges will link student demographics, course taking, teacher qualifications and experience, and delivery modes with student success in postsecondary pursuits.

*Shared Policy Goals:* The K-20 data system will support the State's four shared policy goals adopted by the Montana Office of Public Instruction, Montana University System, Board of Public Education, and Montana Legislature:

- 1. Align high-school outcomes with college readiness expectations to facilitate the transition from high school to college.*  
When completed, the K-20 data system will provide five-year trend data for remediation rates of freshmen entering the MUS from Montana public high schools, allowing partners to track the desired decline in remediation rates.
- 2. Increase college participation of Montana high-school graduates*  
When completed, the K-20 data system will provide five-year trend data for Montana public high-school graduates enrolling in the MUS to help partners track the desired increase in enrollment.
- 3. Expand distance learning opportunities.*  
When completed, the K-20 data system will provide baseline and five-year trend data for Montana public high-school student enrollment in distance learning, allowing partners to track the desired increase in enrollment.
- 4. Utilize k-20 data to improve student access and achievement.*  
When completed, the K-20 data system will track student access and achievement information and generate timely, topical reports to inform policy and practice that improves student access and achievement.

*The OPI Strategic Directions:* This grant will directly support OPI strategic direction #3: *Provide current and accurate educational information to the state, school districts, and communities to promote data-driven policy decisions and assist in improving teaching and learning.* By improving the quality and accessibility of education information, the OPI and its partners will make progress toward achieving its strategic directions.

**Implications of Failure to Meet the Goals**

The primary implication of failure to achieve the goals of the grant will be a lack of understanding of reasons that Montana public education and higher education are not achieving policy goals. Without support from this grant, Montana won’t have the resources to complete transfer of transcripts, to provide a link from K-12 to higher education courses; to use data to assess college readiness; or to align expectations between K-12 and college. Failure to meet our grant goals means that we still won’t clearly understand barriers to student success.

**(b) Project Deliverables**

Our project deliverables are directly related to our grant goals and the Priority #3 requirements. The following table details Montana’s K-20 SLDS deliverables for each of the requirements that we will address in work to be funded under this grant:

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| <i>1. Governance and Policy Requirements</i>  |
| a. Governance   |
| 1. Form project governance structure  |
| 2. Establish K-20 project governance plan and systems   |
| 3. Form K-20 data governance structure for linking postsecondary data to K-12 data  |
| 4. Establish K-20 data governance plan and systems for linking postsecondary data to K-12 data                                      |
| b. Institutional support  |
| 1. Provide dedicated K-20 data research analyst and business analyst positions to meet requirements of the K-20 data system project |
| <i>2. Technical Requirements</i>  |
| a. Privacy Protection and Data Accessibility  |
| 1. Produce documentation that clearly articulates what SLDS data are accessible to which users and for what purposes                |
| b. Data quality   |
| 1. Establish procedures to ensure the integrity, security, and quality of the K-20 system data                                      |
| 2. Train high-school representatives how to accurately enter data   |
| 3. Establish procedures for monitoring the accuracy of data entering the K-20 data system   |
| 4. Provide dedicated staffing who understands both data sets to help validate data, ensure accuracy and generate reports            |
| c. Interoperability   |
| 1. Create the exchange mechanism with the MUS and collect and validate the data required for analysis                               |
| 2. Produce useful, actionable reports   |
| 3. Collect and validate the data required for analysis from the K-12 districts  |
| 4. Develop transport and validation mechanisms to move data from LEAs to the OPI  |
| 5. Establish electronic delivery of the K-12 transcript to Montana universities   |
| 6. Establish secure access  |

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| 3. <i>Data Use Requirements</i>  |
| a. Training on the use of data tools and products  |
| 1. Develop a training program on Microsoft Business Intelligence tools   |
| 2. Provide training on the use of data tools and products to users   |
| b. Professional development on data use  |
| 1. Develop a professional development module to help end-users effectively interpret and apply data  |
| c. Evaluation of data products, training, and professional development   |
| 1. Secure an outside evaluator to design and implement a participatory, continuous improvement evaluation model for the data products, training, and professional development components of the K-20 data system |
| d. Partnerships with research community  |
| 1. Establish research partnerships with MUS and the Board of Public Education to provide analysis and reporting of data for questions outside standard reports   |

**(c) Timeline for Project Deliverables**

**Implementation**

The K-12 GEMS data warehouse will be expanded to house the additional data and provide the reports and dashboards that the K-20 solution requires. This approach makes sense for Montana because of the low cost of ownership of GEMS, the availability of an experienced, in-house team to make the required modifications, and the flexibility of the solution. While the OPI will house and maintain the solution, the delivery of the reports to the public will be made via web pages that are co-branded between the OPI and MUS.

The basic design of the proposed system envisions the data from the LEAs and MUS flowing to the OPI. The OPI will import the data into the GEMS data warehouse and will provide reports and dashboards. The LEAs also will electronically deliver their transcripts to a third-party transcript service. This is required in order to ensure that the state assigned student identifier (SSID) currently used within the OPI is included on the student transcript and is delivered to all Montana institutions of higher education on a consistent basis. The SSID will be included in the MUS data warehouse and will become the link between higher education data and the K-12 data.

A key component of the design is to make the solution easy to use for the LEAs. The OPI envisions building a transfer system that will allow the LEAs to send the data required for analysis and the transcript to a single location (the transfer system). This system will then provide the data to both the third-party transcript service and to the OPI for inclusion in the data warehouse. We believe this design allows the greatest flexibility, follows best practices, and provides a framework that the OPI can leverage in the future for other types of data. Please see the diagram in *Appendix A* for a graphical representation of the proposed data flow.

Enterprise Architecture

As part of the GEMS project, the OPI established an Enterprise Architecture that is used when new projects are started. This document will be used to inform the decisions made during the K-20 data warehouse project. An Enterprise Architecture is a living structure, so it may be modified

during the project, but significant changes are not anticipated to accommodate the proposed changes to GEMS or the envisioned data exchanges.

*Collection and validation of the data required for analysis from the K-12 districts*

The K-20 Data Governance Council will define the data set required for analysis and the data standards that the data collection will follow. A large portion of the envisioned data is not yet collected by the OPI. In order to collect the data from the LEAs, the project needs to help the LEAs extract the data from their legacy systems and design a delivery system to deliver the data to the OPI for inclusion in the data warehouse.

Montana's LEAs vary widely in the systems they use and the local IT expertise available to help with the extraction and transportation of data. While many LEAs will have the expertise to provide the required data once the data set is defined, the project anticipates working with each high school individually to obtain the needed data. The OPI also anticipates the need to work directly with the vendors of the student information systems in use at the LEAs.

At the beginning of the project, LEAs will be surveyed to help the OPI understand the type and amount of assistance each LEA will need as well as the need to work with third-party vendors. For the smallest LEAs, the project will also be prepared to provide a manual entry option to collect data that does not currently reside in a student information system at the LEA. The solution envisions a simple set of data collection screens delivered via the web to collect the required data.

Based on feedback from LEA personnel, the OPI does not believe that the current method used to obtain data from the LEAs is robust enough to handle the additional data required for this K-20 project. In order to successfully collect the required data without placing an undue burden on the LEAs, the OPI proposes to build a new electronic transport mechanism.

The project will consult the OPI's existing LEA advisory committee to help develop the requirements for the design of a new transport mechanism. Based on previous discussions, the OPI believes that it will need to provide multiple options to the LEAs for the solution to be effective. The solution will also need to communicate with multiple entities, so that each LEA can build one connection to the transport service and use it to deliver data both to the OPI and to a third-party transcript service.

Larger LEAs have expressed a desire to move to a SIF-based solution, and the OPI believes that School Interoperability Framework (SIF) will be part of the solution. However, smaller LEAs believe the costs associated with SIF outweigh the benefits and a flat file transport may be more appropriate. The final decision on the transport mechanism(s) will be made at the conclusion of the requirements phase of the project, and may include a variety of electronic transport options, including SIF, flat files, web services, and manual entry.

Another key component of transporting data is the validation of the data and feedback to the LEAs on validation errors. The same LEA advisory council that helps develop the transport mechanism will help design the validation solution. The techniques employed will depend somewhat on the transport mechanism, and the OPI believes that it will be able to leverage the

existing Microsoft toolset from the GEMS project to perform the validation and deliver reports to the LEAs.

The effort involved to develop the proposed solution and to work with each district will be significant and constitutes more work than the proposed in-house team will be able to handle. In order to ensure success in a timely manner, the OPI believes that a third party should be engaged to assist with these tasks and to provide third-party software, as needed. The project timeline allows time to engage third-party assistance for both the extraction of the data and the creation of the transport solution.

*Creation of the exchange mechanism with the MUS and collection and validation of the data required for analysis*

The MUS currently maintains the data required for analysis in a central data warehouse and has experienced staff to maintain this warehouse. The Oracle solution utilized by the MUS provides for easy extraction of data, so obtaining the data is not anticipated to be an issue.

The MUS and OPI have tentatively agreed on a proposed data set (see *Appendix A*), which the K-20 Data Governance Council can use as a starting point to determine the set of data elements to be transferred. The K-20 Data Governance Council will also establish the standards that the data set will be based on.

While the data set is being finalized, the project team will agree on a transport mechanism from MUS to the OPI. Since the OPI and MUS do not anticipate the updates from MUS to be frequent, the team believes that a simple, automated secure FTP transfer between the sites will be sufficient to handle the transport of the data.

The proposed data set to be transferred is currently housed within the MUS data warehouse. The data are validated for accuracy when imported into the MUS data warehouse. Significant additional validation should not be required when the data are imported into the K-20 data warehouse. The additional validation will focus on the accuracy of matching student records between the two systems. The tools used for validation will be the same as those used for the LEA data transport.

*Data Interoperability*

The postsecondary data provided by the MUS will include data elements listing students' majors, as well as degrees and certificates received. The coding for these elements will be based on the federal Classification of Instructional Programs (CIP codes). In addition, the necessary data elements will be included in the postsecondary dataset that enable the identification of first-time, degree-seeking students, as defined by the Integrated Postsecondary Education Data System (IPEDS).

*Electronic delivery of the K-12 transcript to higher education*

A key to the success of bringing MUS data together with K-12 data is the ability to match records between the two systems. Currently, there is no common student identifier that the two systems share.

