

U.S. Department of Education

Washington, D.C. 20202-5335



APPLICATION FOR GRANTS UNDER THE

**STATEWIDE LONGITUDINAL DATA SYSTEM RECOVERY ACT GRANTS
CFDA # 84.384A
PR/Award # R384A100060**

Closing Date: NOV 19, 2009

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Application for Federal Assistance SF-424		Version 02
* 1. Type of Submission		
<input type="checkbox"/> Preapplication	* 2. Type of Application: * If Revision, select appropriate letter(s):	
<input checked="" type="checkbox"/> Application	<input checked="" type="checkbox"/> New	
<input type="checkbox"/> Changed/Corrected Application	<input type="checkbox"/> Continuation	* Other (Specify)
	<input type="checkbox"/> Revision	
* 3. Date Received:		4. Applicant Identifier:
12/4/2009		
5a. Federal Entity Identifier:		* 5b. Federal Award Identifier:
		NA
State Use Only:		
6. Date Received by State:		7. State Application Identifier:
8. APPLICANT INFORMATION:		
* a. Legal Name: Arizona Department of Education		
* b. Employer/Taxpayer Identification Number (EIN/TIN):		* c. Organizational DUNS:
866004791		804746097
d. Address:		
* Street1:	1535 West Jefferson	
Street2:		
* City:	Phoenix	
County:		
State:	AZ	
Province:		
* Country:	USA	
* Zip / Postal Code:	85007	
e. Organizational Unit:		
Department Name:		Division Name:
Arizona Department of Education		Information Technology
f. Name and contact information of person to be contacted on matters involving this application:		
Prefix:	* First Name:	Donald
Middle Name:		

* Last Name: Houde

Suffix:

Title: Chief Information Officer

Organizational Affiliation:

Arizona Department of Education

* Telephone Number: (602)364-1368

Fax Number:

* Email: DONALD.HOUDE@AZED.GOV

Application for Federal Assistance SF-424

Version 02

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:

84.384A

CFDA Title:

Statewide Longitudinal Data System Recovery Act Grants

*** 12. Funding Opportunity Number:**

ED-GRANTS-072909-001

Title:

Institute of Education Sciences;(IES) Grant Program for Statewide Longitudinal Data Systems Recovery Act Program (ARRA) CFDA 84.384A

13. Competition Identification Number:

Title:

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

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

Arizona Education Data Warehouse (AEDW)

Attach supporting documents as specified in agency instructions.

Attachment:

Title :

File :

Attachment:

Title :

File :

Attachment:

Title :

File :

Application for Federal Assistance SF-424

Version 02

16. Congressional Districts Of:

* a. Applicant: AZ-ALL

* b. Program/Project: AZ-ALL

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

Attachment:

Title :

File :

17. Proposed Project:

* a. Start Date: 5/1/2010

* b. End Date: 4/30/2013

18. Estimated Funding (\$):

a. Federal	\$ 20000000
b. Applicant	\$
c. State	\$
d. Local	\$
e. Other	\$
f. Program	\$
Income	
g. TOTAL	\$ 20000000

*** 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.)**

Yes No

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: Margaret

Middle Name:

* Last Name: Dugan

Suffix:

Title: Deputy Superintendent of Public Instruction

* Telephone Number: (602)364-2339 Fax Number:

* Email: MARGARET.DUGAN@AZED.GOV

* Signature of Authorized Representative: * Date Signed:

Application for Federal Assistance SF-424

Version 02

*** Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.



U.S. DEPARTMENT OF EDUCATION

BUDGET INFORMATION

NON-CONSTRUCTION PROGRAMS

OMB Control Number: 1894-0008

Expiration Date: 02/28/2011

Name of Institution/Organization:
Arizona Department of Education

Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.

SECTION A - BUDGET SUMMARY
U.S. DEPARTMENT OF EDUCATION FUNDS

Budget Categories	Project Year 1(a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	\$ 6	\$ 0	\$ 0	\$ 0	\$ 0	\$ 6
2. Fringe Benefits	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
3. Travel	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
4. Equipment	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
5. Supplies	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
6. Contractual	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
7. Construction	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
8. Other	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
9. Total Direct Costs (lines 1-8)	\$ 6	\$ 0	\$ 0	\$ 0	\$ 0	\$ 6
10. Indirect Costs*	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
11. Training Stipends	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
12. Total Costs (lines 9-11)	\$ 6	\$ 0	\$ 0	\$ 0	\$ 0	\$ 6

***Indirect Cost Information (To Be Completed by Your Business Office):**

If you are requesting reimbursement for indirect costs on line 10, please answer the following questions:

(1) Do you have an Indirect Cost Rate Agreement approved by the Federal government? Yes No

(2) If yes, please provide the following information:

Period Covered by the Indirect Cost Rate Agreement: From: 7/1/2009 To: 6/30/2010 (mm/dd/yyyy)

Approving Federal agency: ED Other (please specify): _____ The Indirect Cost Rate is 13.5%

(3) For Restricted Rate Programs (check one) -- Are you using a restricted indirect cost rate that:

Is included in your approved Indirect Cost Rate Agreement? or, Complies with 34 CFR 76.564(c)(2)? The Restricted Indirect Cost Rate is 0%



U.S. DEPARTMENT OF EDUCATION
BUDGET INFORMATION
NON-CONSTRUCTION PROGRAMS

OMB Control Number: 1894-0008

Expiration Date: 02/28/2011

Name of Institution/Organization:
Arizona Department of Education

Applicants requesting funding for only one year should complete the column under "Project Year 1." Applicants requesting funding for multi-year grants should complete all applicable columns. Please read all instructions before completing form.

SECTION B - BUDGET SUMMARY
NON-FEDERAL FUNDS

Budget Categories	Project Year 1(a)	Project Year 2 (b)	Project Year 3 (c)	Project Year 4 (d)	Project Year 5 (e)	Total (f)
1. Personnel	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
2. Fringe Benefits	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
3. Travel	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
4. Equipment	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
5. Supplies	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
6. Contractual	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
7. Construction	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
8. Other	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
9. Total Direct Costs (lines 1-8)	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
10. Indirect Costs	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
11. Training Stipends	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
12. Total Costs (lines 9-11)	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Standard Form 424B (Rev.7-97)

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
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 sub-agreements.
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 (Clear Air) Implementation Plans under Section 176(c) of the Clear 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. "1721 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

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 the 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.

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 Representative:

Name of Authorized Certifying Representative: Margaret Dugan

Title: Deputy Superintendent of Public Instruct

Date Submitted: 10/28/2009

Disclosure of Lobbying Activities

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

1. Type of Federal Action: <input type="checkbox"/> Contract <input checked="" type="checkbox"/> Grant <input type="checkbox"/> Cooperative Agreement <input type="checkbox"/> Loan <input type="checkbox"/> Loan Guarantee <input type="checkbox"/> Loan Insurance	2. Status of Federal Action: <input type="checkbox"/> Bid/Offer/Application <input checked="" type="checkbox"/> Initial Award <input type="checkbox"/> Post-Award	3. Report Type: <input checked="" type="checkbox"/> Initial Filing <input type="checkbox"/> Material Change For Material Change only: Year: 0 Quarter: 0 Date of Last Report:
4. Name and Address of Reporting Entity: <input checked="" type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier, if known: 0 Name: Arizona Department of Education Address: 1535 West Jefferson City: Phoenix State: AZ Zip Code + 4: 85007-	5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Name: Address: City: State: Zip Code + 4: - Congressional District, if known:	
6. Federal Department/Agency: US Department of Education	7. Federal Program Name/Description: Statewide Longitudinal Data System CFDA Number, if applicable: 84.384A	
8. Federal Action Number, if known:	9. Award Amount, if known: \$0	
10. a. Name of Lobbying Registrant (if individual, last name, first name, MI): Address: City: State: Zip Code + 4: -	b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI): Address: City: State: Zip Code + 4: -	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Name: Margaret Title: Dugan Applicant: Arizona Department of Education Date: 10/28/2009	
Federal Use Only:		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

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 any 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 or 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

Arizona Department of Education

PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE

Prefix: First Name: Margaret Middle Name:

Last Name: Dugan Suffix:

Title: Deputy Superintendent of Public Instruct

Signature: _____

Date:

10/28/2009

ED 80-0013

03/04

Project Narrative

Project Narrative - Project Abstract

Attachment 1:

Title: **Project Narrative_Project Abstract** Pages: **1** Uploaded File: **Project Narrative_Project Abstract.pdf**

Abstract: Arizona Education Data Warehouse (AEDW)

Arizona will improve, expand, and broaden the scope of its now-operational (grades P-12) Arizona Education Data Warehouse (AEDW) Student Longitudinal Data System (SLDS). The vision of this far-reaching project is to support the career readiness of students for the workforce and provide a foundation to enable them to achieve their life goals. Major goals in support of this vision are: to improve every student's educational experience and raise achievement levels from preschool through postsecondary education; to significantly broaden linkages between teacher and student information by restructuring and improving existing systems; to improve Arizona's existing discipline and non-violence intervention solution; to create a master data management system to support the wide array of education-related programs and support services; to provide a 360-degree view of education financial data; to safeguard personal information by developing a statewide identity management and single sign-on system with identity federation; and to establish a comprehensive data governance and training organization managing ongoing content and technical training. In support of these goals, this project will produce five major outcomes:

Expanded Data Content Scope and Provision of Supporting Instructional Tools and Technology.

Expansion of AEDW scope and instruction is necessary for nearly all system capabilities and elements of the SLDS. Every enhanced education-related service and program offered by Arizona requires amplified data about participants, students, organizations and facilities. To achieve this and to meet the challenges of Arizona's educational environment data collection processes, existing inadequate student information systems, financial data systems, and identity management systems will be restructured and enhanced.

Improvement of Student and School Performance Measures. To understand whether an individual child is making acceptable progress in accruing needed academic skills, Arizona will employ the Colorado Growth Model (CGM). The current academic progress of individual students will be measured relative to the progress of their academic peers through an intergovernmental agreement. The system will support interoperability with agencies and institutions, both within the state and outside the state.

Expansion of the Data Warehouse. The existing AEDW uses student and school data elements and makes available 60 student-related measures via a web-based portal. All new data from outcomes 1 and 2 must still be developed and added.

Creation of Data Governance, Training and Communications Organizations. Outcomes 1 through 3 will double the number of data providers, the content and volume of data, and the number of information measures. A rigorous change control organization and process will be created to bring about more reliable information in support of education decisions, by assessing and ensuring the quality and the integrity of data in the system, providing extensive training and communications methodology to the user community.

Expansion of Technology Infrastructure. To achieve Arizona's desired outcomes requires additional desktop support, workstation and UI tools, servers and databases, bandwidth, and enhanced security and data administration. This expansion will result in significant improvements in communications with higher education data systems, and enhance both data exchange and interoperability among a variety of agencies and institutions.

Project Narrative

Project Narrative - Project Narrative

Attachment 1:

Title: **Project Narrative** Pages: **30** Uploaded File: **Project Narrative.pdf**

a. Need for Warehouse Project

The Arizona Department of Education's (ADE) education reform initiatives are focusing on four areas: driving excellence in teaching by recruiting, developing, retaining, rewarding and equitably distributing quality teachers and principals; providing LEAs instructional support tools, and technology that enable teachers to target and measure improvement at individual student levels; adopting standards and assessments for success in college or the workplace that include international benchmarks; and supporting struggling schools by providing information and insight on issues which affect academic achievement. This project will build upon existing technological investments to increase the quality and content of data, resulting in improved student achievement and measures of success throughout Arizona's education ecosystem.

ADE has dedicated significant resources for the past three years to re-chart Arizona's education data management roadmap and an enterprise business intelligence solution. At the heart of the solution is the preschool to high school (grades P-12) Arizona Education Data Warehouse (AEDW). In support of the AEDW, core organizational structures were established to manage the critical areas of governance, training, information security, analysis, project management, operations, infrastructure management, quality assurance, end-user support, and professional solutions development.

The AEDW will be expanded in content and technology to match the state's educational initiatives. This requires restructuring the source data collection systems which provide AEDW data content, enhancing data training and governance, and providing additional student and school performance measures. Project needs are described in outcome order:

- Outcome 1: Expand Data Content Scope and Provide Instructional Support Tools and Technology
- Outcome 2: Improve Student and School Performance Measures
- Outcome 3: Expand the Data Warehouse
- Outcome 4: Establish Data Governance, Training and Communications
- Outcome 5: Expand Technology Infrastructure

All outcomes take into consideration the requirements of state fiscal stabilization fund phase II. Implementation of the outcomes provides Arizona with information to achieve equity in teacher distribution, support struggling schools and support standards and assessment requirements.

Expand Data Content Scope and Provide Instructional Support Tools and Technology

EXPAND STUDENT DATA COLLECTION AND SOURCES

ADE oversees public education and provides education-related and support services to a very wide population. Apart from the normal business streams of schools and support programs for P-12 students, ADE provides services and support to 0-5 year-old children, juveniles in secure care, families, adults, college students, community groups and seniors—as well as to Bureau of Indian Education (BIE) schools. (*see figure 1.1*)

Each of the services and programs supported by ADE requires basic data about the participants, students, organizations and facilities where these are offered, along with the relationship between

the providing and parent organizations. ADE needs to know what education and related services are being provided at each facility, to whom, how these offerings are funded, and the physical characteristics of all facilities used in the educational arena. Information is collected about many of these elements, but the data collection processes, student information systems, financial data, and identity management systems are products of the 1990 public education setting and must be restructured and enhanced to meet the challenges of Arizona's 21st century educational environment.

The current AEDW is in development and includes measures about K-12 student memberships in schools, participation in SPED, ELL and support programs, AIMS achievements, attendance and other funding factors. For AEDW to be expanded to include all birth-to-work data (P-20 and early childhood), development of production data systems to collect, process, store, and manage the extended data are needed. This also requires unique identity management, development (or redevelopment) of collection systems, enhanced data and physical security, re-architecting the master data management components, and creation of a state-offered student management system option for small LEAs.

In particular, the data collection system processes and structures need comprehensive analysis and structuring to provide state education agencies with all data necessary for education management from birth to work. This work must be completed so that the SLDS project can continue to absorb the data and create measures around them. The key areas of data collection that need restructuring include student data (birth to work: early childhood, preschool, K-12, college, post-college), financial data systems (state school financing, state and federal grants management), teacher data (certification and highly-qualified attribution, as well as personnel identification and tracking), and a suite of master data management areas (school facilities, nutrition sites, business licensing, and other funding recipients).

Besides the regular teacher data collection systems, we must be able to link students and teachers, by grade or course. This data area will include courses taken by high school students in vocational and community colleges, plus the teachers of those courses and resulting grades. The course information will be available to ECAP planning. Course achievement will be linked with standardized assessment results to analyze the level of congruity for various student populations.

Preschool and early childhood data should have the same focus as K-12 student data. ADE doesn't currently collect non-state-funded preschool student and facility data, such as Head Start programs and private preschools on public district sites. This data is critical to understanding the impacts of early childhood and preschool education on kindergarten attainments and the first standardized state assessment taken in grade three. Later, longitudinal data could help determine the impact of early childhood and preschool programs on later stages of the education pipeline.

There are data collection requirements for K-12 tribal students, on and off the reservations. During the K-12 sequence, many of the reservation students change from BIE-controlled schools to Arizona public schools—and vice versa. The difficulty here is not only tracking achievement from school to school, but also targeting educational interventions for those struggling with cultural and environment changes between the two. Longitudinal data sharing between BIE and ADE would help eliminate risks for dropping out of both systems and encourage students to achieve attainable goals by supporting their progress through ECAPs.

Other mobile student groups require additional data collection, enhanced measures, and inter-agency sharing (potentially via WICHE): migrants (using the new M6), inter-state students from

border areas, secure care (detention and corrections), and students from active military families (through MIC3). Much like the tribal students, these children move from one educational situation to another, some regularly. Many of these students are at-risk. Secure care students may go from a regular public school to a rehab program to a secure care facility and although there is required academic record sharing, their achievement results and educational plans may not follow as quickly. It is incumbent upon the state to not let these children fall by the wayside because of frequent transitions. We must be able to track them continuously and provide academic progress along their educational migrations.

Along with the elementary and secondary student course data, we need to collect post-secondary student college and readiness evaluations, post-secondary attainment, and student remediation needs. Remediation coursework in post-secondary level is an indicator of gaps between secondary and post secondary. Results of remediation studies will enable better targeted instruction for high school students.

EXPAND STUDENT ENVIRONMENTAL DATA

Expand discipline and school safety data

The AZ SAFE system was developed with a federal grant and provides LEAs with information needed to improve school safety and to meet federal and state reporting requirements. All public schools in Arizona are required to report safety-related incident and disciplinary action data to ADE through AZ SAFE, beginning this school year (FY 2010).

AZ SAFE produces reports that provide school administrators with the information needed to evaluate individual student and group behavior, design school-wide and individual student interventions and strategies, and improve disciplinary practices. AZ SAFE has also improved the ability of ADE to accurately report information to the Education Data Exchange Network (EDEN/EDFACT) and to easily accommodate the frequent changes to these requirements without imposing any additional burdens on schools.

To provide a complete perspective of students' disciplinary infractions, data in AZ SAFE needs to be augmented by data on juvenile referrals, detention, and adjudication by the county juvenile courts. A need for further research regarding juvenile transitions between public schools and secure care surfaced from discussions with Arizona Supreme Court juvenile justice authorities and analysis of their data. In 2008, 46,750 juveniles ages 8-18 were referred to authorities for diversion, detention, or adjudication. Though not all were public school students, the referred juveniles constitute 4.91% of students in public schools from this age group in 2008. Of the number referred, 25% were detained.

This court data and data recommendations from pilot schools that used AZ SAFE in 2009 require enhancements to the system. The enhancements are in line with the federal direction of improving crime reporting and data-driven decisions by the school, including data augmentation, ad hoc reporting tools, and auto-generation of parent notification letters. Additional reporting is needed to improve campus safety with real-time reporting containing suspension and expulsion data, as well as other usability tools.

Discussions in the numerous statewide pre-implementation workshops indicated the need for research on perceptions of school climate. Also, as 2010 is the first year of statewide data collection, an audit of the data collected is needed to improve data quality.

The changes will require extensive school-level professional development and technical assistance. Part of this work will be for training on proper and improper use of incident and disciplinary action data and part will be to support school personnel in effective utilization of data to improve school climate and safety.

Collect student home environment factors

Several initiatives are in development for on-line and home delivery of curriculum, particularly for rural and proximity-challenged students. To determine delivery options and methods, ADE will need to know what kind of technology is available to students in their homes. In addition, student economic factors that are needed to determine targeted programs and other support opportunities are now collected sporadically at the school level and submitted to ADE in aggregate. We will need to establish a data collection process and protocol for both kinds of data at the LEA and SEA level and include the data within the new student data collection system. Once in the production systems, we will be able to load it to the data warehouse, measure it by a variety of criteria, and use it as criteria in other measures such as AIMS achievements.

IMPLEMENT ECAP (EDUCATION AND CAREER ACTION PLAN) SYSTEM

The Arizona Statewide Education and Career Action Plan (ECAP) will be an individualized planning process to help about 250,000 high school students develop individual career aspirations and goals, and to examine how their curriculum choices may affect their goal achievement. In an ECAP system, students identify their goals and the career counselor and/or teachers respond with an action plan of required coursework and study. ECAP will be accessible to students in grades 9-12, parents, school career counselors and teachers. It will combine, for each student, his/her interests, abilities, talents, academic planning and progress toward career goals into a personalized education roadmap.

Teachers will monitor students' academic performance and response to instructional and behavioral intervention in view of the student career plans and intercede if a student falters. Students may adjust the ECAP as they mature and evolve throughout their high school years. After three to four years' usage, ECAP will be able to provide data on student preparedness for civil or military careers. Data from ECAP will be incorporated in the AEDW to support measures on readiness and ECAP process effectiveness.

Given student mobility within the Arizona public schools, the ECAP process can be successful only if managed by a rigorous enterprise class web-based solution. In the future, the usage of this system can be extended to post-secondary students.

ENHANCE ACQUISITION OF LEA DATA

Current acquisition of data from LEAs is done through submission of data transaction files via batch submission every 20 days. This means that there is a significant delay in the accuracy of current data stored at ADE, which impacts accuracy of the payment and reporting processes. Both ADE and the LEA spend unnecessary resources on data corrections. The implementation of near-time data acquisition from LEA SMS systems will be of benefit to both LEAs and ADE. It

will also require negotiation with 15 SMS vendors regarding enhancement of their software to accommodate this change in data delivery.

LEA Student management systems (SMS) must be enhanced to enable implementation of new data exchange technology that supports near-time data submission, validation, and verification. ADE intends to create a robust system that allows data push or pull and/or have ADE receive direct access to pull from LEA databases. Consequently, the changes will require SMS software modification and technical support. In addition, the LEAs will need training on the submission processes along with guidance about user identification federation (see EduAccess subtask) that will be involved.

CREATE A STATEWIDE SMS OPTION FOR LEAS

Arizona has many remote small LEAs in rural and high-poverty areas and hundreds of small charter schools that cannot afford to contract with a student management system vendor, or to install a sophisticated technology infrastructure. At the moment, these entities use the online version of ADE's student data submission and maintain their local records in isolated databases or spreadsheets. To provide integrated support that allows such LEAs to manage their students and submit data easily to the state student data system, ADE will create a statewide SMS option for such schools.

The envisioned system will provide both local student management functions and data collection required by ADE. It will have an easy-to-use interface for entities which do not have technical support and provide a method to allow non-standard school year calendars (like year-round, part-day, daily, secure care). It will also provide the opportunity to capture non-public student data for schools which have data relationships with ADE for assessments, SPED support, and federal grant funding distribution. It is intended for use by any kind of LEA, including rural public districts, private and federally funded preschools, county secure care schools, one-room schoolhouses, or tribal schools.

EXPAND SCHOOL STAFF DATA

ADE currently collects school personnel data in disparate systems. These systems currently include a teacher certification system (CERT), highly qualified teachers (HQT), and school district employee report (SDER). These systems were created separately over the years and have remained independently structured. To achieve the new initiatives related to teachers and principals, ADE must create a new integrated system that supports public school personnel employment, certification of teachers and other education professionals, curricula assignment of teachers for determination of teacher compliance with HQT requirements, and data about preparation pathways of teacher aides.

Every school staff member will carry a unique ID. The ID will be used in the student-teacher relationship record of the new student data system and in computing metrics for teacher quality and performance, such as student academic achievements and growth.

The SDER system is an annual snapshot of staff employed on October 1st, capturing positions assignments, salaries, and years of experience. It was designed mainly for calculating teacher experience index which is a factor in state equalization funding. Changes within the fiscal year

are not captured until the following year, limiting the usability of the data. The redesign of this component will have to provide for a continual update and inclusion of charter schools.

Course and Class Taught

The new system will have a component to collect grade, class, and courses taught by each teacher and teacher aide. This data is available in most LEAs implementation of SMS software. Where it is not available, LEAs will use the new statewide SMS.

IMPLEMENT EDUCATION ENTITY MASTER DATA MANAGEMENT

Master Data Management

ADE currently collects a substantial number of master data items, predominantly about facilities providing education (like physical and on-line schools, juvenile secure care facilities), programs (disabled student, languages, nutrition, etc), and organizations (community services, Head Starts, Boys and Girls Clubs, tribes) that are serviced or supported through ADE.

The central entity database, Enterprise, was developed originally to support ADE's primary function of school funding by keeping track of every entity that received funds for students. As the functions of ADE expanded, the data collection scope and flexibility need grew substantially. ADE deals with a much wider range of entities now, like private and parochial schools, the county coalition Head Start grantees, privately held behavioral health facilities, even tribal dormitories. ADE also has many more complex relationships with a myriad of entities beyond school districts and charter schools, including US Dept. of Agriculture nutrition program support to adult day and child care sites, migrant programs, schools on reservations that are overseen by both ADE and BIE, public schools and charters on- and off- military bases.

Another central system keeps track of the programs and services offered by entities, as well as collecting data about which students use the programs and services at what place. This system, SAIS (Student Accountability Information system), depends on the Enterprise system for entity data. The combination of these two systems can tell you which student is enrolled in an English language program, at what school, during what time period. However, like Enterprise, the major capabilities of SAIS were developed to track students for school funding. Currently, ADE is involved in supporting many programs and services that are beyond state funded P-12 education, such as tracking Arizona State University students who are teacher candidates, expectant mothers and children up to three years old in early childhood programs, and tribal students who take the state standardized test at BIE schools. As the opportunities to participate in new programs expanded, so did the complexity of student relationships. Many students are attending more than one school at a time, or are involved in many more programs at the same time.

Due to the shortcomings of the existing Enterprise system, ADE was forced to create artificial entities and artificial relationships between those entities in Enterprise, as well as squeeze new non-student types and programs into SAIS. While this allowed ADE to continue capturing data for new kinds of students, entities, programs and relationships, it has become increasingly difficult to manage and use the data effectively. It also inhibits wide roll-out of the new EduAccess identity management system, which requires clear hierarchical structures for the definition of user groups.

The analysis of school funding sources for the school phase of AEDW has exposed the urgent need to redesign ADE master data management. A new data model has been developed; its full development and implementation require substantial resources that were not included in the scope of the original SLDS project. To accomplish this level of structure, we must engage the services of a data architect to determine directions and oversee progress.

Expand EduAccess (statewide identity management)

ADE has multiple system domains, each of which requires its own access management. Current users have a unique ID to access functions, but they may have several, depending on how many roles they have or how many entities that they work for. ADE has begun integrating user sign-on and account management for all its domains, as well as externally provided resources, by establishing an agency-wide identity management system (IDMS). The IDMS, EduAccess, provides a single user account management interface to manage access to all ADE-provided resources, including the AEDW. It will also federate identity management and authentication services with trusted partners such as school districts. The result will be faster access to distributed resources by reducing the user's need to remember and deal with multiple usernames and passwords, lower sign-on failure rate, upgraded system security including the ability of administrators to change a user's access to all system resources in a coordinated, consistent way, and improved administrator response when adding/removing users and modifying access rights.

EduAccess will contain identification and credential information to verify the user's unique identity and support the user's authentication for any secondary domains with which interaction may be required. It will also provide a single user account management interface through which all the component domains may be managed. EduAccess will be used to provide full identity management and authentication services for trusted external partners that do not have the technical capabilities for full federation (such as small school districts).

Although the first phase of EduAccess is underway, the current version is limited to one entity access per person. Once the master data management project is completed with more accurate hierarchy trees, EduAccess will be able to grant users access to the uppermost entity in the tree. Data structure enhancements will provide multiple access paths where appropriate, such as for the State Board of Education and the State Charter Boards, who must have the ability to look across all entities within AEDW measures. Additional development will be needed to provide appropriate user interfaces to post-secondary entities, preschools, and other data providers not currently submitting data to ADE and also to allow thousands of new users, such as teachers, to be identified and federated across multiple new data systems.

RESTRUCTURE EDUCATION FINANCIAL DATA

Within the production environment that feeds the warehouse systems, there are a series of financial data systems. Most of these systems were created 10 years ago to support the then-new student data system and payments to schools. Much like the other changes to ADE's business areas, the financial systems have been modified regularly to shoehorn in the additional functions necessary for state payments and federal financial tracking.

The financial data systems have key inter-relationships with the student and master data systems. Accurate student data is used to determine per-student state funding, federal entitlement and grant fund distribution, and other supplemental state funding.

Within the AEDW, the initial perspective of financial data to be included related to state school funding, state and federal grant funding allocations, USDA child nutrition grant programs, and funding provided by other state agencies, like the Arizona State Land Department's classroom site funds (derived from sales and leases of school trust land). Comprehensive funding source analysis revealed a multitude of other sources that weren't part of the original perspective, the inclusion of which will enable a complete view of actual education funding.

This additional data comes predominantly from sources external to ADE's current financial systems, some of which can be extrapolated out of existing manual reporting mechanisms and some which would require intergovernmental agreements. For example, county education service agencies receive direct federal funding, which turned up during examination of the federal spending data made available online this year. They also receive state grants which are not funneled through ADE. Both of these funding lines are distributed to districts or schools outside of ADE's purview. ADE will need data sharing agreements with each of the 15 counties to obtain the detailed data.

Much like the federal website project to gather all lines of funding across the federal government, AEDW is looking to create a complete funding view of the LEAs. This view is essential for Arizona's educational need management, equity funding distribution, and state spending-per-student studies. It will also provide a federal view of total funding to Arizona education entities.

Although the analysis of the additional data has been completed, along with mapping of the hierarchies that provide this funding, the current AEDW project will not be able to achieve complete implementation within the original grant window ending July 2010. Data from newly discovered funding sources requires sharing agreements, structured landing zones, data architecture and databases, and development of ETL, as well as reverse engineering of current systems to ensure that critical business rules are accounted for.

Improve Student and School Performance Measures

Perhaps the most important facts for an Arizona parent, teacher or administrator is whether an individual child is proficient in the academic skills expected of him or her and, if not, whether that child is making sufficient progress to become proficient as he/she approaches graduation. While information about individual student proficiency as measured by Arizona's standard assessment is available, information about growth toward proficiency is not.

ADE recognizes that the quality of public education rests on the ultimate academic success of each child in its care and that it is necessary to measure each child's proficiency and also to measure growth towards proficiency throughout his or her assessment history. Without a growth measure, determining if progress is adequate to attain proficiency is not possible.

The current AEDW provides measures of how well a child has performed on each annual assessment that he or she has taken. Having had no appropriate source, however, the warehouse lacks a measure of individual student growth. The Colorado Growth Model (CGM), developed for the Colorado Department of Education, is being used by several states and is also part of Project LEARN's objectives for other states. ADE will use the CGM to evaluate individual student and school level growth.

The CGM produces a measure of an individual student's current academic progress relative to the progress of that student's academic peers. The measure, student growth percentile (SGP), is obtained using a statistical technique called quantile regression. The measure is normative rather than absolute, so its calculation is not dependent upon Colorado's state assessment.

Individual student growth percentiles can be summarized for any group of students using the median SGP over the group. In particular, we can obtain a school's or district's growth measure by calculating the median SGP across all students in that school or district, respectively. We can then compare growth measures of schools within a district or districts within the state. A group growth measure can be adapted to measure teacher performance as well. The Colorado Growth Model provides tools for the calculation and display of such summary measures.

Expand the Arizona Education Data Warehouse - AEDW

The current AEDW makes use of the student data available in ADE operational systems: school membership, needs and program participation, absence/attendance (FYs 2003-2009) and AIMS (FY 2005-2009). This scope of data elements was dictated by state legislation in 2001.

Transactional data from the operational systems, fed by the LEAs' SMS, is transformed into fact and dimension formats. These formats enable automated aggregation of facts by pre-defined relevant combinations of dimensions (criteria). The aggregation of a fact by a set of dimensions is called a measure. Simple facts are transformed to complex facts (e.g. two consecutive school/grade memberships are transformed to a school/grade transition fact supporting the analysis of student mobility; single annual AIMS results of a student are transformed to a student multi - years progression array). AEDW has 60 student-related measures available for use via a portal that also includes guiding and training material. So far, access and training has been provided to ADE staff and selective LEA staff and researchers. School and teacher measures (based on current operational data) are in development (see Outcome 1).

Numerous live demonstrations and extensive users' experience have proved the power of AEDW as an ultimate decision support tool for both LEAs and SEAs. Applying the AEDW methodology and technology to the data elements contained in Outcomes 1 & 2 and post secondary data is considered the best way to provide decision support to all levels of education organizations.

The State Data System Advisory Panel of the State Higher Education Officers has issued a draft on the desired capabilities of a state data system for post secondary education, including data elements needed for post secondary students from the systems of higher education organizations. For Arizona higher education organizations, this data can be fed directly to AEDW. Arizona Higher Education officials can define derived facts and measures to support their particular interests and issues relating to all or particular stages in the P-20 workforce transitions.

Establish Governance, Training and Communications

The result of Outcomes 1 and 2 will double the number of data providers, content and volume of data relative to the current AEDW data scope. In addition, the results of Outcome 3 will at least double the number of information measures designed for AEDW's data scope, and significantly increase the number of users by providing information measures aggregated at teacher level.

To develop and implement Outcomes 1 and 2 the project management will have to engage, communicate with and train approximately the following number of people or entities:

- 65 County Superintendents and County Educational Services Agencies staff
- 5000 School district superintendents, principals, and administrators
- 900 Charter holder and charter school administrators and principals
- 90,000 Teachers in district and charter schools
- 20 SMS vendors
- 250 LEAs IT managers/coordinators
- 400 Organizations providing pre-K education funded by federal agencies
- 50 Arizona higher education institutes
- 50 Other AZ state and tribal agencies involved in education
- Parents/guardians of 1.1 million students

This constituency will require ongoing communications about data, development progress and usage. It will also require training for usage of AEDW measures, tailored to constituent type.

Systematic data governance— managing confidentiality, standards, quality, documentation, archive and change control— is an absolute necessity given the extensive scope of the entities involved in providing source data and using the production data systems and the data warehouse.

Expand technology infrastructure

Outcomes 1-3 mandate expansion of the technology infrastructure at ADE, which includes expansion of computing resources, end-user hardware and software, and network capacity. Given the magnitude of systems to be implemented and restructured in Outcomes 1, 2 and 3, sustainability of the technology infrastructure is crucial to the expanded internal and external user communities and requires significant focus. Disaster recovery and business continuity are indispensable to implementation of the scope of these systems and ongoing operations. The massive training that will be needed for the new data collection systems requires tools for an appropriate training environment.

b. Project Outcomes

There are a multitude of process and development needs for the expansion of the warehouse business content and technology. Some are knowledge-based (production data business analysis, communication plans, training and user support, governance, oversight, master data management), some are tool-based (event/data usage logging, identity management, archival management), and some are combinations of knowledge and tools (usability, data and system quality assurance, logical and physical data security, architectural agility, scalability, high availability, predictability and reliability, along with operational management, disaster recovery and business continuity). Each of the major outcomes described below must internally address these areas as part of their delivery package.

- Outcome 1: Expand Data Content Scope and Provide Instructional Support Tools and Technology
- Outcome 2: Improve Student and School Performance Measures
- Outcome 3: Expand the Data Warehouse

- Outcome 4: Establish Data Governance, Training and Communications
- Outcome 5: Expand Technology Infrastructure

Outcome 1: Expand Data Content Scope and Provide Instructional Support Tools and Technology

SUBTASK 1: EXPAND STUDENT DATA COLLECTION AND REDEVELOP DATA COLLECTION SYSTEMS

This subtask has a number of complex components. To successfully collect and integrate many new data elements will require redevelopment and re-architecture of the production systems that collect source data, as well as interagency and data delivery agreements. Each of the sub-activities within this subtask contains implicitly data agreements, cross-platform/cross-system technical and data architectures, security standards, and extensible data modeling.

- 1.1.1 Re-architect the existing and new data and the data collection processes.** New data include student contact (home address, Guardian, last 4 SSN digits), immunization, curriculum and course completion, student-teacher link at a course and/or grade level, post secondary courses taken while a student is in high school, post secondary readiness (SAT, ACT, AP achievements), additional data as required by incorporation of student populations not included in the current student data systems.
- 1.1.2 Incorporate birth-preschool age children into the new student data system** including children in Head Start programs, Early Childhood programs, preschools programs provided by public schools, some for a fee. The entities providing education for this age group will be included in the new master data management system, see Outcome 1.
- 1.1.3 Incorporate mobile students into the new student data system.** This population includes children of migrant families (source data is in COESTAR and M6 systems), children of active military families (source data is in MIC3 system), students in detention and behavioral rehabilitation facilities (source data is in correction state agencies), interstate students the inclusion of which requires collaboration with Arizona adjacent states to establish data sharing.
- 1.1.4 Incorporate tribal students** educated by BIA, BIE and other non public schools. The current data collection is partial and fragmented. Complete inclusion of tribal students in the new student data system is a top priority for the tribal authorities in Arizona.

SUBTASK 2: EXPAND STUDENT ENVIRONMENTAL DATA

- 1.2.1 Expand school safety data collection and usability (AZ SAFE).** 50 schools piloted the AZ SAFE system during FY 2008-2009 and pointed out the need to enhance the system as follows: include seclusion, restraint, and corporal punishment in the mandatory list of disciplinary actions; enable LEAs to define disciplinary actions unique to their needs; capability to download granular data from AZ SAFE to LEAs for developing local reports specific to their circumstances; auto-generate letters for parent notification; alert messages for actions requiring compliance with due process rights of students and adherence to requirements of Special Education students with Individualized Education Plans (IEPs); report real-time suspensions and expulsions with removal reason for local

board review; collect juvenile court data; and modify AZ SAFE reporting to accommodate these enhancements.

- 1.2.2 Collect School Safety data via intermittent studies.** FY 2010 is the first year of statewide data collection in AZ SAFE. An audit of data collected by the end of the year is essential to ensure that all LEAs are capturing and submitting incidents data as required.

In addition to factual data collection in AZ SAFE there is a need to collect data on perceptions about school safety. ADE will conduct a survey to assess the perception of school safety climate at the school level by implementing survey tools. Assessment at the school level is necessary for schools to improve school climate knowledge beyond the information provided by AZ SAFE incident data.

Given the size of the student population involved in behavior resulting in judicial referrals, ADE will also conduct a study of student transitions in and out of behavioral health and secure care facilities.

- 1.2.3 Provide School Safety professional development and technical assistance.** School and LEA personnel need further professional development and technical assistance on proper and improper use of incident and disciplinary action data and on effective utilization of data to improve school climate and safety.

- 1.2.4 Collect student home environment considerations** (economic factors and computer availability). Develop periodic standard statewide survey to collect data from students' guardians on household economic factors and availability of computers and internet access. The survey will be conducted by the LEAs and data submitted to new student data system. LEAs will be consulted in the formulation of the survey.

SUBTASK 3: IMPLEMENT AN ECAP (ELECTRONIC CAREER ACTION PLAN) SYSTEM

The purpose of ECAP is to enable students to plan their future education and career in collaboration with their parents, teachers, and school career counselors. ADE's Career Technical Education Division recently acquired a similar tool from University of Oregon, AZCIS. AZCIS provides students with career information, academic and civil service practice tests, and self assessments relative to inclinations and aspirations, but does not support commensurate high school curriculum planning or collaboration with teachers, parents, and school career counselors.

- 1.3.1 Acquire and implement centralized ECAP software** that supports the collection, management and user display of a secured electronic student portfolio including attributes related to academic, career, postsecondary and extracurricular activities empowering students to enter and adjust their personal information as they mature and evolve throughout their high school years. The system should be: highly available (24x7), use EduAccess to manage identity authentication and user authorization, and interface with curriculum component of the new student data system. The lessons learned from the implementation of AZCIS will be included as criteria for selection of the ECAP system.
- 1.3.2 Construct and conduct training on the career planning process at the LEA level,** primarily for teachers and career counselors.
- 1.3.3 Examine and determine extensibility to post secondary students** and their transitions to the workforce.

SUBTASK 4: ENHANCED ACQUISITION OF LEA DATA

Current acquisition of data from LEAs is done through submission of data transaction files via batch submission every 20 days. This means that there is a significant delay in the accuracy of current data stored at ADE, which impacts accuracy of the payment and reporting processes. Both ADE and the LEA spend unnecessary resources on data corrections. The implementation of near-time data acquisition from LEA SMS systems will be of benefit to both LEAs and ADE.

- 1.4.1 Determine impact of desired data acquisition processes** on vendors' or LEA-originated SMS software and negotiate with all SMS vendors regarding enhancement of their software to accommodate this change in data delivery.
- 1.4.2 Design and develop new data acquisition processes** that support near-time data submission, validation, and verification for both the new ADE student data system and for the vendor SMS.
- 1.4.3 Provide data submission training to LEAs** along with guidance about user identification federation (see EduAccess subtask) that will be involved.

SUBTASK 5: CREATE/IMPLEMENT A STATEWIDE SMS OPTION FOR LEAS

The statewide SMS option for LEAs must provide for collecting and managing student data, including personal, demographic, immunization and student contact information, enrollment and funding-related data, curriculum and teacher-student links, needs assessment and program participation, attendance and absence, college readiness (SAT, ACT, AP achievements) and concurrent enrollment and coursework in post-secondary schools. The system will have an easy-to-use interface for schools and support non-standard school year calendars. The system will service public and non-public schools like BIE, preschools and Head Starts, and private schools.

- 1.5.1 Determine whether to buy or build and implement an SMS system solution.**
 - 1.5.1.1 For an SMS build solution**, create blueprints based on the new student data system, and develop data capture and management front-end.
 - 1.5.1.2 For an SMS buy solution**, define and conduct RFP and software selection and develop data exchange with new state student database.
- 1.5.2 Develop user data querying and reporting capabilities** whether bought or built, to create custom reporting.
- 1.5.3 Create statewide training mechanism for the new SMS system** and enhance the technology support center to assist users of the system.

SUBTASK 6: EXPAND SCHOOL STAFF DATA

The new school staff system will include all publicly funded schools, i.e., school districts and charter schools. It will also collect data on teachers-in-the-making from teacher pathways, including post-secondary enrollment and curricula in regular and continuing education programs.

- 1.6.1 Design a new school staff system** that satisfies the following requirements:
 - 1.6.1.1 Provide a certification component** with online application and payment submission, tools for applicants to track application status; workflow management for certification process; online display of certification status and decision; strict data edits to ensure certificates are issued to properly qualified individuals; online access for LEA

administrators for monitoring application status of their staff; provide notification to certificate holders, LEA administrators, and Dept. of Public Safety on expiration of certifications and fingerprint background checks; and data feeds from teacher pathways.

1.6.1.2 Provide a school district employment component to provide LEAs with the ability to submit employment data files at the beginning of the schools and maintain the data over time by transaction or online submission.

1.6.1.3 Provide a HQT component to provide entry and maintenance of teacher data related to teacher qualifications as required by HQT, including grade and courses taught; determination of highly qualified status; and notification to LEAs on non-qualified teachers.

1.6.1.4 Provide tools for the Investigations Division to inquire about the veracity of application and employment data and provide workflow management process for ongoing investigations.

1.6.1.5 Create conversion process to migrate current system data to populate the new system.

1.6.2 Provide internal and external training support for the new system.

SUBTASK 7: IMPLEMENT EDUCATION ENTITY MASTER DATA MANAGEMENT

1.7.1 Implement master data management

1.7.1.1 Create master data management structures. The design for the new master data management database uses four hierarchy structures to view the role and relationships of entities. This will require data modeling and database design, as well as providing user interfaces to maintain the ongoing data entry. In addition, there will be significant effort to manually map the existing entities into the new structures for conversion and entry of extended definitions and to identify unused data.

1.7.1.2 Retrofit existing systems and link to new student data systems. New data models will require the restructuring of existing production systems and adaption or use of extended attribute availability. The data model for the new student management and EduAccess identity management systems will also address these new structures, which will require extensive coordination among all of the projects.

1.7.1.3 Collect new data about current entities by obtaining sharing agreements where appropriate or soliciting additional data from already linked sources, including definition and details for funding, legal, service role, or data relationships.

1.7.2 Expand EduAccess data security/identity management

1.7.2.1 Install and implement EduAccess infrastructure.

1.7.2.2 Develop a full-fledged system that enhances security compliance through centralized authentication and improved account administration tools and enables accurate and efficient management of thousand of user accounts with minimal new staff.

1.7.2.3 Migrate AEDW user accounts from pilot system to new EduAccess accounts.

1.7.2.4 Provide federated identity management and authentication services with trusted external partners, allowing partners to effectively and securely manage account access within their authorization sphere.

LEAs and state agencies involved in education are external partners by the nature of their relationship with ADE. In order to determine their trustworthiness in this context, a set of criteria and an evaluation process by which to determine trustworthiness has to be determined by the governance board and the chief security officer.

1.7.2.5 Enhance AEDW access privilege components to accommodate user access to multiple specific LEAs.

1.7.2.6 Train system developers regarding integration of existing applications with EduAccess.

1.7.2.7 Convert existing ADE system applications to fully utilize EduAccess.

SUBTASK 8: RESTRUCTURE EDUCATION FINANCIAL DATA

The restructure of education financial data consists of developing tools for acquiring and managing funding data sources that are ignored by ADE, as well as restructuring existing financial systems to enable streamlined payment processing and financial reporting.

1.8.1 Confirm data availability from additional funding sources and obtain data sharing agreements with the agencies and develop data acquisition processes for additional funding sources, including structured landing zone and data architecture and databases.

1.8.2 Redesign existing financial systems (state equalization appropriation, charter school funding, budget/annual financial reporting, transportation funding and teacher experience indexing, State Land Dept. classroom site and institutional funds, state and federal grant distribution management). These systems will require reverse engineering to ensure that critical business rules are accounted for.

Outcome 2: Improve Student and School Performance Measures

SUBTASK 1: IMPLEMENT COLORADO GROWTH MODEL

The Colorado growth model (CGM) provides student and school level growth indicators. It uses the Colorado state standard assessment for academic performance data, along with Colorado-specific technology for data processing, storage, and display. To use the CGM, Arizona will need to adapt the model to the Arizona state standard assessment (AIMS) and ADE technology.

2.1.1 Implement the statistical component of CGM in the ADE SQL Server environment, test relative to AIMS and make necessary adaptation.

2.1.2 Implement adapted model for student-level growth, including design and development of processes and tools for providing student-level growth information to schools, teachers and parents.

2.1.3 Develop guides for parents, teachers, and principals on student-level growth; conduct teacher and parent workshops on interpretation and use of results.

- 2.1.4 Study CGM school-level growth formula** and evaluate its adequacy for Arizona; explore criteria to determine the formula for Arizona implementation; design and develop processes and tools to implement and display the Arizona formula.
- 2.1.5 Conduct workshops for LEAs** on interpretation and use of school-level growth results.
- 2.1.6 Analyze impact of school-level growth indicators** on AYP and AZ LEARNS; modify AYP and AZ LEARNS or develop new school performance indicators.

SUBTASK 2: CREATE METRICS FOR STATE FISCAL STABILIZATION FUND

Metrics for SFSF compliance will be collected, vetted and published by ADE for statewide consolidation by the Arizona Department of Administration.

Outcome 3: Expand the Data Warehouse

The redesign of currently collected data under outcome 1 subtask 1 is anticipated to change the current operational student data structure and their associated code values. These changes do not impact the current AEDW facts and measures but will require revision of the data transformation programs that take this operational data as a source.

Outcome 1 contains subtasks to incorporate special student groups that are currently left out (e.g. students in BIE schools, students in detention centers). Accommodating these groups in AEDW may necessitate changes in current dimension tables.

Implementation of a new education entities master data management under Outcome 1 will require replacement of the current AEDW dimensional data structures relating to these entities. The preliminary data model that has been developed is significantly richer and more complex than the existing one, implying a significant development effort.

- 3.1 Revise AEDW data transformations** to match data structure changes resulting from Outcome 1 redesign of student data and education entities master data.
- 3.2 Incorporate new data from Outcomes 1 & 2:** To provide longitudinal perspectives of the new data, DW dimension and fact tables and relevant measures need to be developed with particular emphasis on relationships among AIMS results, ELL assessments, student growth, and ECAPS; Accommodating student groups that are currently left out (e.g. students in BIE schools, students in detention centers) in AEDW may necessitate changes in current dimension tables; Implementation of a new education entities master data management under Outcome 1 will require replacement of the current AEDW dimensional data structures relating to these entities.
- 3.3 Incorporate post secondary student data** from the student information systems of the post-secondary institutes: Develop data acquisition processes from local post secondary systems to AEDW for student data related to demographics, institution, enrollment status, financial aid, academic activity, academic remediation, academic attainment, and college to work (using the University of Arizona tracking software); Develop new dimension and fact tables for post secondary student data; Create new measures related to transition from secondary to post secondary education, post secondary education progression and attainment, post secondary transition to workforce.

This subtask needs to be pursued with full collaboration of Arizona post secondary institutions

- 3.4 Enhance AEDW Portal:** expanding data dictionary to accommodate all new data; expand User Guide and portal texts to accommodate all new measures; provide a variety of user analytical and viewing tools beyond Excel 2007. As AEDW user community expands, implementation of additional user tools, some more technical and some less technical, is required

Outcome 4: Establish Data Governance, Training and Communications Organizations

SUBTASK 1: CREATE DATA GOVERNANCE ORGANIZATION AND PROCESSES

- 4.1.1 **Establish a data governance board** that will represent all stakeholders (universities, LEAs, county superintendents, state universities, community colleges, state agencies and BIE, etc.), set and approve guidelines related to managed data access, privacy and security, adequacy of training and data model implementation, prioritization of funding opportunities recommended by governance support groups, and resolve data conflicts. The board would also be empowered to determine the most effective way to integrate data acquisition and distribution between P-12 and higher education.
- 4.1.2 **Establish ADE technology governance support group** to provide recommendations on spending priorities of this grant award. It will also provide analysis and recommendations for: controlling data confidentiality and data security for stored data and data-in-flight (in transmission state); access privileges (who can see what) and access management (granting and denying); data audit management including data quality metrics, sanctions and incentives for data quality improvement; data standards for both stored and in-flight data, including definition, format, source, provenance, element level and contextual integrity rules; documentation standards for data elements (data dictionary) and systems components; data archival and retrieval management system, along with change control and change tracking. If AEDW technology does not successfully support a critical requirement, the governance group will provide an analytic recommendation.

SUBTASK 2: CREATE DATA TRAINING AND COMMUNICATIONS ORGANIZATION

- 4.2.1 **Establish a training and communication group** to provide training strategies, establish regional training teams, create and deliver course curricula, monitor training delivery, communicate with users and external stakeholders, provide media content and delivery methods, and deliver training content at user and train-the-trainer sessions. (*see figure 1.3*)
- 4.2.2 **Develop a training system** with a centralized Website for all training activities including: online course schedule and registration; subject matter/business system sites; training delivery modes (e.g. e-learning, webinars, virtual classroom, in person, movies, documentation, conferences); guidelines for training mode usage; knowledge base for user inquiries; training material and support documents; and website traffic tracking.
- 4.2.3 **Acquire Knowledge Base software and develop content** to assist the ADE support center in resolving users' questions and issues.

Outcome 5: Expand Technology Infrastructure

SUBTASK 1: PROVIDE TECHNOLOGY TOOLS, INFRASTRUCTURE AND SUPPORT FOR NEW SYSTEMS

(SEE FIGURES 5.1, 5.2, AND 5.3)

- 5.1.1 Provide solution for new system front ends**, including desktop support and tools, including workstation and user interface tools using thin client solutions, web servers, firewalls, along with internet and data center bandwidth increases.
- 5.1.2 Provide backend hardware and software to support landing zone** for inbound data streams, databases and applications, data backups and acquire sufficient physical data center space for the additional technology.
- 5.1.3 Acquire technical implementation expertise** to assist with the expansion of the technology infrastructure.

SUBTASK 2: EXPAND ADE TECHNOLOGY INFRASTRUCTURE TO PROVIDE SUSTAINABILITY

- 5.2.1 Implement infrastructure management tools**, including data center server, new web load-balancing devices, data and network security administration, and a global traffic manager.
- 5.2.2 Create a backup data center for disaster recovery and business continuity** mirror imaging for 5.1.1 and 5.1.2. Develop business continuity plans and testable disaster recovery plans; coordinate recovery with ADOA (current data center host); and prepare plans for personnel movement to the facility in Tucson.
- 5.2.3 Review and improve LEA bandwidth capacity** to support the new technology requirements and backup data center.

SUBTASK 3: PROVIDE TRAINING AND COMMUNICATIONS TECHNOLOGY

- 5.3.1 Provide tools for remote electronic training and communications**, including video conference, webinar, and virtual classroom software.
- 5.3.2 Acquire laptops and equipped carts for trainers and classrooms.**

SUBTASK 4: PROVIDE TRAINING, COMMUNICATION AND SUPPORT CENTER TOOLS

- 5.4.1 Expand support center for technology and application systems**, including acquiring more robust monitoring tools, ticketing system, and new servers.
- 5.4.2 Implement click stream website usage tracking software**, including website tracking, usage reporting, and content monitoring.
- 5.4.3 Implement training management** software including session registration management.
- 5.4.4 Implement knowledge base software** that will be used by Operations, Support Center, and Network Support staff to track issue solutions and other necessary knowledge for the new systems.

