

U.S. Department of Education

Washington, D.C. 20202-5335



**APPLICATION FOR GRANTS
UNDER THE**

Statewide, Longitudinal Data Systems

CFDA # 84.372A

PR/Award # R372A120022

Grants.gov Tracking#: GRANT11026279

OMB No. , Expiration Date:

Closing Date: Dec 15, 2011

****Table of Contents****

Form	Page
1. Application for Federal Assistance SF-424	e3
2. Assurances Non-Construction Programs (SF 424B)	e6
3. Grants.gov Lobbying Form	e8
4. Dept of Education Supplemental Information for SF-424	e9
5. ED Abstract Narrative Form	e10
<i>Attachment - 1 (1234-NC 05 Project Abstract)</i>	e11
6. Project Narrative Form	e12
<i>Attachment - 1 (1240-NC 06 Project Narrative)</i>	e13
7. Other Narrative Form	e51
<i>Attachment - 1 (1236-NC 08 Appendix A Optional Attachments)</i>	e52
<i>Attachment - 2 (1237-NC 09 Appendix B)</i>	e60
<i>Attachment - 3 (1238-NC 10 Appendix C Résumés of Key Personnel)</i>	e69
<i>Attachment - 4 (1239-NC 11 Appendix D Acronym List)</i>	e104
8. Budget Narrative Form	e105
<i>Attachment - 1 (1235-NC 07 The Budget)</i>	e106
9. Form ED_524_Budget_1_2-V1.2.pdf	e181

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: <input type="checkbox"/> Preapplication <input checked="" type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	* 2. Type of Application: <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	* If Revision, select appropriate letter(s): <input type="text"/> * Other (Specify): <input type="text"/>
* 3. Date Received: <input type="text" value="12/15/2011"/>	4. Applicant Identifier: <input type="text"/>	
5a. Federal Entity Identifier: <input type="text"/>	5b. Federal Award Identifier: <input type="text"/>	
State Use Only:		
6. Date Received by State: <input type="text"/>	7. State Application Identifier: <input type="text"/>	
8. APPLICANT INFORMATION:		
* a. Legal Name: <input type="text" value="North Carolina Department of Public Instruction"/>		
* b. Employer/Taxpayer Identification Number (EIN/TIN): <input type="text" value="561492826"/>	* c. Organizational DUNS: <input type="text" value="0671956100000"/>	
d. Address:		
* Street1: <input type="text" value="301 North Wilmington Street"/>	Street2: <input type="text"/>	
* City: <input type="text" value="Raleigh"/>	County/Parish: <input type="text" value="Wake"/>	
* State: <input type="text" value="NC: North Carolina"/>	Province: <input type="text"/>	
* Country: <input type="text" value="USA: UNITED STATES"/>	* Zip / Postal Code: <input type="text" value="276011058"/>	
e. Organizational Unit:		
Department Name: <input type="text" value="NC Dept. of Public Instruction"/>	Division Name: <input type="text" value="Data, Research & Federal Policy"/>	
f. Name and contact information of person to be contacted on matters involving this application:		
Prefix: <input type="text" value="Mr."/>	* First Name: <input type="text" value="Karl"/>	
Middle Name: <input type="text"/>	* Last Name: <input type="text" value="Pond"/>	
Suffix: <input type="text"/>	Title: <input type="text" value="Enterprise Data Manager"/>	
Organizational Affiliation: <input type="text" value="North Carolina Department of Public Instruction"/>		
* Telephone Number: <input type="text" value="9198073600"/>	Fax Number: <input type="text" value="9198074000"/>	
* Email: <input type="text" value="karl.pond@dpi.nc.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

Delete Attachment

View Attachment

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

North Carolina P-20W Statewide Longitudinal Data System

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View 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.

<p>* SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL</p> <p>Sarah Harris</p>	<p>* TITLE</p> <p>Enterprise Data Manager</p>
<p>* APPLICANT ORGANIZATION</p> <p>North Carolina Department of Public Instruction</p>	<p>* DATE SUBMITTED</p> <p>12/15/2011</p>

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

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 <input style="width: 90%;" type="text" value="North Carolina Department of Public Instruction"/>	
* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE	
Prefix: <input style="width: 50px;" type="text" value="Mr."/>	* First Name: <input style="width: 150px;" type="text" value="Karl"/> Middle Name: <input style="width: 100px;" type="text"/>
* Last Name: <input style="width: 200px;" type="text" value="Pond"/>	Suffix: <input style="width: 50px;" type="text"/>
* Title: <input style="width: 250px;" type="text" value="Enterprise Data Manager"/>	
* SIGNATURE: <input style="width: 250px;" type="text" value="Sarah Harris"/>	* DATE: <input style="width: 100px;" type="text" value="12/15/2011"/>

SUPPLEMENTAL INFORMATION
REQUIRED FOR
DEPARTMENT OF EDUCATION GRANTS

1. Project Director:

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

Mr. Karl Pond

Address:

* Street1: North Carolina Department of Public Instruction
 Street2: 301 North Wilmington Street, Room 5326
 * City: Raleigh
 County: Wake
 * State: NC: North Carolina
 * Zip Code: 276011058
 * Country: USA: UNITED STATES

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

9198073241 9198074000

Email Address:

karl.pond@dpi.nc.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.]

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. Project Abstract

Project Title

The NC P-20W SLDS Project: *Creating a Preschool to Workforce Statewide Longitudinal Data System in North Carolina*

Project Description

The state of North Carolina, Governor Beverly Perdue and its key educational agencies believe in providing a valuable educational for NC children by focusing on the *Career & College: Ready, Set, Go* initiative. It is essential that North Carolina develop the existing partnerships and capabilities to create a longitudinal data system that connects student data from preschool to workforce to support Governor Perdue's education initiatives.

The statewide longitudinal data system envisioned by the P-20W SLDS Project enables North Carolina's Department of Public Instruction (NCDPI) to satisfy key aspects of our state's educational priorities, working with partner agencies in workforce and higher education. Funds allocated through this grant (Priority 3) would go toward the following objectives to enhance North Carolina's efforts in establishing a P-20W SLDS:

- ◆ Establish common infrastructure for each student in post-secondary education systems and coordinate UIDs with workforce data
- ◆ Establish a data broker based system so that agency researchers can ask questions that each of the data systems linked can answer
- ◆ Automate regular cross-agency reporting
- ◆ Provide key data to empower the legislature and NC policy makers to make better decisions concerning funding, program assessments, as well as identifying trends in North Carolina education

Expected Outcomes

The data broker and distributed query system established through this grant will enable smarter, more targeted data sharing among partners and their researchers. This federated database system will transparently integrate multiple autonomous database systems into a single database system, enabling North Carolina to answer tougher questions about our educational system and make more informed decisions about its future. This grant would provide funds to enhance the state's substantial momentum in moving toward a shared, interoperable SLDS, focusing on the data of students after graduation from high school.

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

6. Project Narrative

(a) Need for Project

History of North Carolina Public Education

North Carolina has always believed in quality education for all students, with this being a founding principle dictated by the state's constitution. "The people have a right to the privilege of education, and it is the duty of the State to guard and maintain that right," it states.¹ NC has consistently been on the leading edge in establishment of public and private higher education institutions.

The University of North Carolina (UNC) was the first public university in the United States, chartered in 1789, and the only one to graduate students in the eighteenth century.²

In 1817, Archibald D. Murphey, known as the *father of public education*, presented to the General Assembly a report that included a plan for the state's intervention in the educational process. Murphey's plan called for the General Assembly to establish a public school fund (The Literary Fund) and further provided that a State Board be elected to manage that fund.

The first common school law of North Carolina, passed by the legislature in 1839, established the principle of combined State and local funding for public schools. The law stated that the Literary Fund would provide two dollars for every dollar yielded from local taxes.³

Educational Agency Roadmap in North Carolina

Today, North Carolina is the tenth largest state by population with a 2010 census population of 9.6 million and growing at a faster rate than most states. Its educational system is thus impacted by this growth, with greater than average demands on it. Key educational agencies in North Carolina have enduring partnerships.

North Carolina's workforce and education partners have an established history of sharing data across sectors. Since the early 1990's, North Carolina's public education partners and workforce partners have participated in the North Carolina Common Follow-up System. In 2008, a group was formed to oversee the establishment of a student unique identifier to allow for seamless information sharing about North Carolina students' educational outcomes whose efforts continue today.

¹ North Carolina Constitution, Section 15

² www.northcarolina.edu/

³ www.dpi.state.nc.us/stateboard/about/history/chapters/one

The agencies involved with this grant and with North Carolina's educational success are:

- ◆ North Carolina Department of Public Instruction (NCDPI)
- ◆ North Carolina Department of Commerce, Division of Employment Security (NCDES)
- ◆ North Carolina Community College System (NCCCS)
- ◆ The University of North Carolina (UNC)
- ◆ North Carolina Independent Colleges and Universities (NCICU)

Each agency is outlined below and an overview of their current capacities and data competencies is provided in the Objectives section.

North Carolina Department of Public Instruction (NCDPI) – The North Carolina Department of Public Instruction (NCDPI) is NC's State education agency (SEA), charged with implementing the State's public school laws and the State Board of Education's policies and procedures governing pre-kindergarten (PK) through grade 12 public education. The NCDPI tracks a large volume of student data using a unique identifier over 115 school districts (LEAs) and nearly 100 charter schools. Its key educational priorities for the students of North Carolina are:

- ◆ Increase the number of students who can read and write at the end of third grade
- ◆ Increase the number of students performing at or above grade level
- ◆ Increase the number of students taking college credits in high school, graduating from high school, and subsequently attending and graduating from a higher education institution

North Carolina Department of Commerce, Division of Employment Security (NCDES) – Formerly the Employment Security Commission, the mission of the NCDES is to promote and sustain the economic well-being of North Carolinians in the world marketplace by providing high quality and accessible workforce-related services. NCDES provides employment services, unemployment insurance, and labor market information to the State's workers, employers, and the public.

The NCDES has a long standing history of collaboration with North Carolina's education partners. Collaborative efforts have included economic, workforce and education related initiatives. The NCDES is the designated state entity responsible for the operation of the North Carolina Common Follow-up System (CFS). The NCDPI, NCCCS, and UNC along with several other state agencies participate in the CFS. The CFS provides a mechanism by which education and workforce related information is linked with wage information from North Carolina's Unemployment Insurance system. The CFS contains information on over 8 million unique individuals from 11 different participating entities. In addition, the NCDES maintains historical unemployment insurance wage record information dating back to 1992 Quarter 4.

North Carolina Community College System (NCCCS) – Each year NCCCS’s 58 institutions enroll more than three-quarters of a million students on campuses that are within 30 miles of 100 percent of the state’s population. The mission of the NCCCS is to open the door to high-quality, accessible educational opportunities that minimize barriers to post-secondary education, maximize student success, develop a globally and multi-culturally competent workforce, and improve the lives and well-being of individuals by providing:

- ◆ Education, training, and retraining for the workforce including basic skills and literacy education, occupational and pre-baccalaureate programs.
- ◆ Support for economic development through services to and in partnership with business and industry and in collaboration with the University of North Carolina System and private colleges and universities.
- ◆ Services to communities and individuals which improve the quality of life.⁴

The University of North Carolina (UNC) – UNC is a public, multi-campus university dedicated to the service of North Carolina and its people. It encompasses the 17 diverse constituent institutions and other educational, research, and public service organizations. UNC constituent institutions encompass close to 45,000 employees with student enrollment across the system exceeding 220,000 in headcount.

North Carolina Independent Colleges and Universities (NCICU) – NCICU comprises NC’s 36 private, non-profit liberal arts, comprehensive, and research colleges and universities accredited by the Southern Association of Colleges and Schools. NCICU represents independent higher education in the areas of state and federal public policy and on education issues with the other sectors of education in the state.

In addition to the above five stakeholder agencies, two additional state agencies are included as parties to the grant, though not full stakeholders. The North Carolina Division of Motor Vehicles (NCDMV) will provide a key bridge in matching UIDs to social security numbers (through a connection with NCDPI). And, the Early Childhood sector, though not a full stakeholder in this grant is noted as having a vested interest in the end product we are seeking to develop, since pre-school data is included. They are thus included in the data governance activities.

North Carolina’s commitment to data driven educational outcomes

North Carolina has always believed in quality education for all students, making continued strides to provide each student with the opportunities to succeed in college and in the workforce.

⁴ www.nccommunitycolleges.edu/External_Affairs/system_mission.htm

Our state has a strong commitment to improving schools and the courage to be at the leading edge of school reform in the nation.

North Carolina consistently receives high marks for setting academic standards, assessing student performance, and providing equitable resources. We are home to 115 PK-12 school districts, 100 of which are county units and 15 of which are city units, and nearly 100 charter schools. North Carolina has:

- ◆ 58 community colleges
- ◆ 17 University of North Carolina Campuses
- ◆ 36 Independent accredited 4-year colleges and universities

North Carolina public schools enrolled approximately 11,000 additional students last year. Over the past two years, the university system enrolled 12,000 additional students and the community college system enrolled 27,000 additional curriculum students. Growing demands on our public education system require smart, responsible investments. Educating our children means protecting our future economic success – today’s students are tomorrow’s workforce.

Beyond our commitment to quality education for all students, North Carolina is also a state that believes in data-driven decision making. Education agencies provide consumers (students and their parents) and each other with data to aid in decisions and projections for coming years:

- ◆ The NCDPI provides the Principal’s Monthly Report, a report collected monthly from the schools and the following data are calculated within: Average Daily Membership (ADM), Average Daily Attendance (ADA), Initial Enrollment (E12), and Membership Last Day (MLD). NCDPI also tabulates the School Activity Report (SAR), collected annually at the end of the second school month. The data includes information about certified staff, staff assignments, course subjects, class enrollment, and class length. The SAR data is the source of legislated Class size reporting, as well as highly qualified NCLB compliance. Other annual data collections include Membership by Grade, Race, and Sex (GRS), Best 1 of 2, Retention, Promotions, and Graduation (RPG) and high school graduate information.
- ◆ The NCCCS and UNC provide extensive performance feedback to high schools regarding how their graduates have performed in college (High School Feedback Report, Freshman Performance Report.) UNC provides similar feedback to all NCCCS regarding their students who later attend NC universities.
- ◆ The NCDPI, UNC, and the NCCCS collaborate with NCDES through the Common Follow-up System to link, education, training and workforce related participation with employment and wage outcomes.

There is a clear commitment to longitudinal student data among educational entities in North Carolina, but what is lacking is a unified and convenient way to share data for meaningful

interpretation and use. With the exception of CFS, the above examples of reporting and communication were largely done via manual data exchange where the agencies shared data with each other on diskettes, then CDs then DVDs and now secure FTP download, with no automated way of retrieving the required information and sharing with all interested parties. The value of a longitudinal data system in North Carolina is widely recognized, and the federal government encourages the analysis of student-level information, over time.

Career and College Promise

Elected in 2008, North Carolina Governor Beverly Perdue's term has thus far been set apart by its focus on education. As a former public school teacher and a Ph.D. in Education Administration, Governor Perdue is keenly aware of the challenges North Carolina schools confront as well as the urgency of the educational issues the state faces. She understands clearly that the success of our education system will define our economic future as a state.

Connecting high school students to the next step, be it college, community college or career is an important and challenging issue. In today's global economy, successful careers could require a two- or four-year degree, a diploma or nationally recognized job credential. In fact, by 2018, an estimated 59% of North Carolina's jobs will require some level of education beyond high school. Continuing North Carolina's tradition of commitment to students' success in and beyond school, Governor Beverly Perdue is tackling this transition with her Career and College Promise Initiative.

The focus on connecting education to jobs for North Carolina students has wide support in the legislative and executive branches, as well as in the business community. Indeed, the Career & College Promise initiative does create higher expectations for students, and will also impose many higher expectations on the North Carolina education system's methods for managing, sharing, and utilizing data. A key element to the Career & College Promise Initiative and the cornerstone by which the success can be measured is to implement a statewide P-20W longitudinal data system to track student data through the transition post-secondary education and/or workforce and provide comprehensive data and information, thus giving greater insight into the success of the state's educational efforts.

Common Follow-up System

As early as 1992, North Carolina's education and workforce partners established a collaborative effort focused on linking individual level data with data from the state's Unemployment Insurance Wage files. The NCDES (previously, the Employment Security Commission) was designated as the host of the system. This system grew out of the recognition by a group of state agencies that quality outcome information was needed on the participants of educational, employment and training programs. The purpose of the Common Follow-Up System (CFS) is to provide information on the educational and employment outcomes of participants in publicly

supported educational, employment and training programs for use in planning, policymaking, program evaluation, resource allocation, and career planning.

The NC P-20W SLDS project detailed in this proposal will take the model that CFS has created and deliver a more robust, responsive, on-demand data system better able to answer researchers' and policymakers' questions.

Objectives

To continue the support and new development for a statewide P-20W longitudinal data system in NC is focusing on four objectives in order to achieve the goal of creating a statewide longitudinal data system. Continued development of our P-20W SLDS enables NCDPI to satisfy key aspects of our state's educational priorities: closing the achievement gap, building 21st century skills and moving toward a statewide P-20W longitudinal data system in which all stakeholders can make informed decisions based on sound data. The approach North Carolina has chosen is a data broker model comprised of a group of five federated data systems.

The proposed data broker design of a hub and spoke system with each of the five agencies' existing data systems as the spokes and a new central data broker as hub will allow for a "federated data system". A federated data system enables a researcher to send a query via the data broker hub that will transparently integrate multiple autonomous database systems into a single federated database, creating a result including data from multiple sources. The constituent databases are connected on a secure computer network and may be geographically decentralized.

A federated data system, where each agency is responsible for their own data, will provide a simpler alternative to than merging each constituent organization's database into one data warehouse. The data hub will provide a fully integrated, logical composite of all constituent databases for reporting and research questions while maintaining ownership and data quality with each agency.

Funds allocated through this grant would go toward the following objectives to enhance North Carolina's efforts in establishing a statewide P-20W longitudinal data system:

- ◆ Establish Common Infrastructure for each student in post-secondary education systems and coordinate unique identifiers with workforce data
- ◆ Establish a data broker based system so that approved researchers can ask questions that each of the federated data systems can answer
 - Via required Research Document Request policy
- ◆ Automate regular cross-agency reporting (such as UNC's Freshman Performance Report)

- ◆ Provide key data to empower the legislature and NC policymakers to make better decisions concerning funding, program assessments, as well as identifying trends in North Carolina education

America COMPETES Act

In accordance with the America COMPETES Act, the architecture of the proposed system will focus on the 12 elements for longitudinal data systems. The table below shows each required element and North Carolina’s status on each, noting which objective in this proposal addresses the element.

Required Element	Current Status	Enhancement outcome
1. An unique identifier for every student that does not permit a student to be individually identified (except as permitted by federal and state laws)	Implemented by NCDPI for students in PK-12.	To be adopted by NCICU, UNC, NCCCS. NCDES to work with NCDMV to match UID to SSN
2. The school enrollment history, demographic characteristics, and program participation record of every student	NCDPI CEDARS (Common Education Data Analysis and Reporting System)	Once UID is implemented – all can gain through data broker
3. Information on when a student enrolls, transfers, drops out, or graduates from a school	This information is communicated as requested from one agency to another, no uniformed process	Automated report among agencies
4. Students’ scores on tests required by the Elementary and Secondary Education Act	NCDPI CEDARS	Shared via data broker
5. Information on students who are not tested, by grade and subject	NCDPI CEDARS and EVAAS	Shared via data broker
6. Students’ scores on tests measuring whether they’re ready for college	NCDPI CEDARS and EVAAS	Shared via data broker

Required Element	Current Status	Enhancement outcome
7. A way to identify teachers and to match teachers to their students	NCDPI CEDARS	Shared via data broker
8. Information from students' transcripts, specifically courses taken and grades earned	NCDPI CEDARS	Shared via data broker
9. Data on students' success in college, including whether they enrolled in remedial courses	NCCCS and UNC have today	Shared via data broker – NCICU to build out this capability
10. Data on whether PK-12 students are prepared to succeed in college	NCDPI CEDARS and EVAAS	Shared via data broker
11. A system of auditing data for quality, validity, and reliability	<ul style="list-style-type: none"> ◆ Sector Feedback Reports ◆ Sector Monitoring ◆ State Audits ◆ Federal Audits and Monitoring 	To be built with data broker
12. The ability to share data from preschool through postsecondary education data systems	Via FTP	Shared via data broker

North Carolina's progress to date has been impressive and our goals for the years to come are ambitious yet attainable. Implementing and utilizing a fully realized PK-20W statewide longitudinal data system will enable the state to better understand the trends, successes, and failures of its students, while making data-driven decisions on a legislative level to address its realities.

This grant would provide funds to enhance the state's substantial momentum in moving toward a shared, interoperable statewide longitudinal data system, focusing on the data of students after graduation from high school.

Objective 1:

Establish Common Infrastructure for each student in post-secondary education systems and coordinate unique identifiers (UID) with workforce data.

Current Capacities

In accordance with the America COMPETES Act, North Carolina's PK-12 educational system has established unique student identifiers to replace social security numbers as a primary means of identification. North Carolina is currently seeking funds to extend the UID system that has been successfully implemented in PK-12 to post-secondary students in North Carolina, as well as make the connection with workforce data.

NCDPI currently utilizes the eScholar UID system in conjunction with The Common Education Data Analysis and Reporting System, known as CEDARS, North Carolina's PK-12 State Longitudinal Data System. The system is composed of various NCDPI source data collection systems, a student and staff identification system, a centralized data repository, and associated reporting and analysis (or "business intelligence") tools. CEDARS supports NC's efforts to use high quality data about students, staff, programs, and finances to make policy and service decisions that will improve student outcomes. Specifically, CEDARS will enable state, local, and federal policymakers and service providers to analyze trends and relationships among various educational factors and student performance over time.

The NCDPI has developed a Statewide UID System that will be the cornerstone of CEDARS. The UID System enables LEAs and Charter Schools to assign a UID for every student and staff member who participates in the NC education system at any point in time. Establishing the capability to assign these identifiers was the first step in NCDPI's multi-stage effort to create CEDARS. The UID enables reliable matching of student-level and staff-level records over time and across DPI applications. This capability is improving data quality at the State and local levels and supports State and local policymakers and service providers in making better data-driven decisions. The system assigns a unique NCWISE ID to every student who participates in the North Carolina public school system. The unique NCWISE IDs follow students between school districts and remain valid even if they move out of state and then return to a North Carolina public school.

This is an excellent starting point for North Carolina's continuing efforts to bridge student data to post-secondary and workforce identifying information. This project envisions a bridge to connect graduating high school students' UIDs to social security numbers and other identifying information, to provide continued information on their educational endeavors.

In addition to assigning UIDs to PK-12 students, the current license from eScholar allows the North Carolina Institutes of Higher Education (IHEs) to match their students to the data in CEDARS and capture UIDs for students who were previously assigned a UID by PK-12. The IHEs do not, however, have licenses to create UIDs for individuals from private PK-12 schools, out-of-state PK-12 schools or out of state IHEs. The P-20W Council proposes to purchase additional licenses from eScholar that would allow the member schools of UNC, NCCCS, and NCICU to assign UIDs to these students, enabling all students to be tracked through the IHE community. This will allow the IHEs to track performance of their students and programs should students cross IHE sectors and use data driven decision methodology to enhance programs within their sectors.

Requirements to be developed

A goal of this proposal is to promote a uniformed approach to assigning and cataloging UID for all stakeholders (NCDPI, NCCCS, NCICU, NCDES, and UNC) enhancing the interoperability of data. Using an interoperable UID system will further increase the quality of the data among all institutions represented in this grant, a substantial benefit to all involved.

Objective 2:

Establish a data broker based system so that agency researchers can ask questions that each of the federated data systems can answer.

Building upon the partnerships established over several years between the key North Carolina education agencies and workforce information holders, the NC P-20W Council aims to set up a data broker based system for data sharing among and between agencies, using UIDs established under Objective 1.

Current Capacities

Since mid-2008, an inter-agency working group composed of representatives from the NCDPI, NCCCS, UNC, and NCICU has been meeting to explore options for building a joint data system that connects all NC education sectors. The NCDES joined the group in early 2009 to represent the workforce end of the education-workforce continuum. Individually, each sector has been working on increasing the quality and accessibility of its data. Collectively, the group has been envisioning an aligned, robust data system that would include formal, Statewide, collaborative governance, and technology infrastructure that would enhance accessibility, quality, interoperability, and use of “shared” data needed both for sector-specific and Statewide, cross-sector analyses. The group has met intermittently since its establishment and continues to work tirelessly toward a seamlessly integrated longitudinal data system for North Carolina students. This group is now the NC P-20W SLDS project governance body.

The group's goal was to address continuous data from pre-school to post-secondary and workforce, or P-20W. Many efforts and systems have addressed the PK-12 data systems and this grant addresses the post-secondary and employment pieces of the data puzzle.

The group of stakeholders for this project will be viewed as a group of five peers, each sharing data with the others. The following are the five stakeholder groups and the scope of the data they collect:

NCDES – NCDES collects, maintains, analyzes, and disseminates a wealth of information related to North Carolina's economy, workforce, and employers as well as information regarding North Carolina's education, employment and training agencies, providers, programs and participants. As part of the NC P-20W SLDS Project, the NCDES will provide workforce related information regarding the participants of North Carolina's P-20 educational system. Relevant data will include employment and wage information as well as other workforce related information.

NCDPI – NCDPI's data collections span the entire landscape of data that are required for federal PK-12 reporting and, as a result of NC's strong centralized education governance structure, includes a greater than typical volume of information required for State monitoring and reporting.

The collection areas include financial (both State and Federal; e.g. Common Core of Data/CCD), programmatic (EDEN/EdFacts, Office of Special Education Programs/OSEP, Migrant Education Program/MEP, Title I, Title II D, School Safety, etc.), student, assessment and accountability, staff, and school, inclusive of Pre- kindergarten through grade 13 (in the cases of early college high school programs) for 1.5 million students, 115 LEAs and 99 charter schools, and 2,500+ schools.

The collections support NCDPI's efforts to meet all Federal and State requirements, to respond to all media inquiries, and to meet the demands of our longstanding data-sharing partnerships with the NC institutes of higher education, external pre-kindergarten programs, and the NC Division of Employment Security.

Having successfully met the requirements for State and Federal data submissions, and having recently implemented a statewide UID, NCDPI has now begun focusing increased attention on data quality, particularly as achieved through comprehensive data governance. NCDPI already has made significant progress in this area through establishment of the Data Management Group (DMG). The DMG is the official data management oversight body of the NCDPI. The DMG is charged with the responsibility and authority to set policy and resolve issues concerning agency data collection, management, and use. The purpose of the DMG is to enable the NCDPI to meet the responsibility of providing accurate and timely data to key stakeholders. Comprised of representation from each business unit, the DMG supports the agency's efforts to achieve the

State Board of Education's (SBE's) mission, by ensuring data quality, accountability, and timeliness, all of which are essential to enabling data-driven decision-making.

The DMG serves as a foundation for agency data governance that may be used as both a springboard for accelerating NCDPI's source data system integration plans and as a model for development of the NC P-20W SLDS governance structure.

NCDMV – This agency will work with NCDPI to match student UID to social security number, for the purpose of suspending licenses of students who are not meeting required attendance. Thus, the framework for matching student UID to SSN already exists and with this grant, we intend to scale it.

NCCCS – The NCCCS Data Warehouse contains information gathered no less than annually from all 58 institutions. It encompasses all student, course, and faculty information for approximately 10 years.

The data warehouse has been developed to give college and system office personnel access to state-level information. This information includes student enrollments, student progression, student characteristics, transcript level data, faculty and staff information, and employment follow up data. Users work with the Business Objects software to analyze and report data from the data warehouse.

UNC – The UNC General Administration Institutional Research Division is responsible for identifying, collecting, and maintaining the University-wide data needed for University management processes and the completion of external reporting requirements.

The Division coordinates the efforts of the 17 University campuses through interaction with the Directors of Institutional Research on each campus to collect, analyze, report, and warehouse quantitative and qualitative data about their institution's students, faculty, staff, curriculum, course offerings, and learning outcomes. UNC institutional data collected includes North Carolina Higher Education Data (NCHED) and Integrated Postsecondary Education Data System (IPEDS) data, as well as institutional files on student data, student course load, course grade, course description, financial aid, facilities, and personnel data. These files are collected at census points, depending on the selected file, throughout the academic year. Most of the collected files contain detailed unit record data.

NCICU – NCICU does not currently have a centralized data system from the North Carolina private and independent colleges and universities it serves. This technical capability and centralized repository of essential data will be developed in tandem with the NC P-20W SLDS initiative, using independent funding. While outside of the parameters of this grant request, the

intended outcome is to create a common data warehouse for the 36 private independent colleges and universities to periodically send their SLDS data. The data system will be located at MCNC, a non-profit technology infrastructure company in Research Triangle Park, NC. This system will serve as a peer system to the other four state government established data systems at the other agencies.

Requirements to be developed

This project aims to establish better interoperability among data collected by NCDPI, NCICU, NCDES, UNC, and NCCCS to allow knowledge and data sharing among agencies and research institutions. To facilitate this collaboration, we will set up a central data hub (based on CEDS fields) for shared data: Central Hub for Integrated Longitudinal Data (CHILD). This system will store and push queries from a variety of sources and agencies. It will provide student level detailed data to agency researchers with special clearance and aggregate level to other researchers within the sectors for analysis for the many levels (i.e., cohort, school, district, state) over multiple years. CHILD will collect data beyond test scores, creating a richer picture of student performance.

The end product will be a more robust and seamless data sharing system as envisioned by the state of North Carolina and its education agencies and will allow for more efficient data sharing under the data governance policy agreed to by all members. It will include:

- ◆ A set of common, aligned data elements, including:
 - A unique identifier that follows a student from preschool to workforce placement
 - Other agreed up on common data elements based on CEDS v2
 - Aligned data standards on the meaning of data elements such as postsecondary grades and credit hours
 - Public metadata from the federated data mart and data dictionary
- ◆ An interoperable data exchange for research and reporting, which include:
 - A data broker based federated data marts (one per agency) based on master data management principles
 - Common metadata from the five agency data marts
 - Distributed Query access data from five heterogeneous data sources
 - Secure query results area to store query results
 - Scheduling system to automate standard cross-agency reporting
 - A system for secure file exchange
 - Protocols for authentication, user authorization, including compliance with FERPA and other federal and state laws governing confidentiality
 - Capacity for ad hoc research requests and reporting capabilities

Objective 3: Automated regular cross-agency reporting

Current Capacities

North Carolina annually produces the Freshman Performance and Transfer Student Performance Reports, which provide feedback to secondary schools and colleges on the success of their former students.

The Freshman Performance Report focuses on high school students who sought admission to a UNC institution in the fall following graduation. This report includes the Freshman Applications Report and the Freshman Performance Report as well as explanatory material for each. The Transfer Student Performance Reports provide information on the academic progress of UNC students transferring from community colleges, private University and Colleges, and other UNC institutions.

When linked with the workforce data available through the CFS, we are able to answer questions such as:

- ◆ *What kinds of jobs did former students from various education levels attain?*
- ◆ *What were their earnings?*
- ◆ *How can job information on graduates help place future students in areas where they are most likely to succeed?*

Additionally, each year the NCDDES publishes information from the CFS. A sample of several of the published tables can be found in Appendix A.

Requirements to be developed

Substantial reports exist for interpreting cross-agency educational data on a state level, but the North Carolina Statewide Longitudinal Data Project seeks to provide more targeted and customizable reports. For instance:

- ◆ *Over a 10-year period, what percent of college graduates came from low performing elementary schools?*
- ◆ *What are the most efficient pathways to college graduation?*
- ◆ *Does alignment of curriculum from high school to college result in better student outcomes?*
- ◆ *What is the relationship between a student's program of study and the industry in which he or she ends up working?*

These and many more longitudinal data questions are currently unanswerable in any streamlined way. The new system will allow for more efficient and secure data sharing. Looking forward,

this could better hone our data models to ensure children are pursuing the correct degree programs.

Another important piece of this plan is to automate the query and reporting such that these reports are run as part of a report cycle. The data will be available in an ad hoc manner as well as when needs arise.

Objective 4:

Provide key data to empower the legislature and NC policymakers to make better decisions concerning funding, program assessments, as well as identifying trends in North Carolina education.

Current Capacities

North Carolina legislators and executives, including Governor Perdue, are profoundly dedicated to the NC Education system and its students' achievements. However, key decisions are only as good as the information provided to the decision makers.

The existing systems, data sharing agreements and outputs have been developed to respond to specific legislative mandates, reporting requirements or agency inquires. Many of these outputs are single purposed. Therefore, while additional analyses are possible, the existing system architectures and processes sometimes require a significant amount of programming and data manipulation in order to respond to questions from administrators and policymakers.

Requirements to be developed

By increasing data accessibility and quality within each sector, this project will enhance each sector's capability to accurately assess and document the achievement of its students and the continuous improvement of the services it provides to them.

This collaboration will also enhance each sector's ability to answer programmatic, policy, and legislative questions about the efficacy and cost-effectiveness of various targeted sector-specific investments.

Finally, by enabling better exploration of questions related to the movement of students across the State's education sectors, it will provide more comprehensive information for assessment, evaluation, and continuous improvement purposes than the current stand-alone data systems operated in each individual sector are able to provide. This cross sector-analysis is perhaps the most promising innovation.

Opportunities for cross-sector analysis that will support NC's efforts to improve services to students at various points along the education-workforce continuum abound. Examples already targeted for exploration include:

- ◆ Evaluating the relationships between P-13 course-taking patterns and student performance in higher education, and using that information to adjust P-13 standards, curricula, and graduation requirements
- ◆ Relating P-13 course taking patterns, degree or certification attainment, and workforce experience, and using that information to adjust and inform investments in various curricula, degree, and certification programs

(b) Project Deliverables Related to System Requirements and Implementation

The NC P-20W SLDS Project seeks to enable five state agencies to share data: NCDPI, UNC, NCCCS, NCICU, and NCDES. The system will require universal adoption of a unique identifier, establishment of a data broker based system for sharing data among the five agencies; a more efficient, secure, and automated reporting capability and the sharing of knowledge learned from this information with key legislators and decision makers.

Objective 1:

Establish Common Infrastructure for each student in post-secondary education systems and coordinate UIDs with workforce data.

Our proposed system would include the universal adoption of the UID developed by CEDARS throughout post-secondary education in North Carolina as well as building a bridge to the workforce data from the Division of Employment Security by matching the UID to social security number.

Deliverables:

- ◆ Adoption of UID by post-secondary agencies and regular matching of enrolled students to CEDARS. North Carolina's proposed system includes an enterprise-wide data architecture that links the five agencies' data together using a master data management of federated data approach. UIDs will be assigned via NCDPI's CEDARS project and postsecondary agencies will store at the systemwide level the matched UID for any student that attended PK-12 in NC. New UIDs will be issued for students in postsecondary programs who did not attend PK-12 in North Carolina.
- ◆ Develop a UID-to-SSN bridge using DMV data so workforce data can be queried.

- ◆ Use Common Education Data Standards (CEDS v2) as the data model. The Education Science Reform Act of 2002 gave the National Center for Education Statistics (NCES) the authority to determine voluntary standards and guidelines to assist state educational agencies in developing statewide longitudinal data systems (SLDSs). To this end, NCES is working with key stakeholders to develop standards for a core set of data elements to ensure that states create P-20W longitudinal data systems that meet the goals of the American Recovery and Reinvestment Act of 2009. Standard data definitions will help ensure that data shared across institutions are consistent and comparable. This, in turn, will make it easier for states to learn how students fare as they move across institutions, state lines, and school levels.⁵

North Carolina's SLDS will comply with the Common Education Data Standards (CEDS v2 and subsequent versions) and will map all data from the four educational agencies to that model. The central hub will query against a single data model/data dictionary based on CEDS v2. Most postsecondary data are stored in the IPEDS normal form. In general where a data model exists at the federal level the various NC educational agencies either adopt it or develop a plan to move to that model. Data from the NCDES will be linked to data from the CEDS v2. The ongoing exchange will be handled by the data hub.

Objective 2:

Establish a data broker based system so that agency researchers can ask questions that each of the federated data systems can answer.

With the common infrastructure established through the adoption of a UID, we will build a data broker to be located alongside the CEDARS Project. This hub, CHILD, will enable each of the five participating agencies to contribute data as well as pull requested aggregated data. This broker will collect and publish the data dictionary and will handle queries from any federated agency, as well as post the results back to the requesting researcher.

The design of the data broker will allow for self-server queries from agency researchers using the described workflow. North Carolina's proposed system will allow secure query via CHILD for distributed query execution to agency researchers. Extensive logging and other data safeguards will be built into the system to assure data privacy and confidentiality of small cells and other classes of protected data. Memoranda of understanding also will provide guidance for data sharing and use. De-identified unit record level data for research requests can also be established if need be. No individually identified data will be publicly released. All reports and analyses will be carefully considered so that no aggregate data points with fewer than five observations are publicly displayed. All security protocols will be set up according to users and will be subject to audits of the partner agencies.

⁵ <http://nces.ed.gov/programs/ceds/about.asp>

NCSLDS Broker/Exchange Model

North Carolina's proposed system includes an enterprise-wide data architecture that links the five agencies data together using a master data management of federated data approach. UIDs will be assigned via NCDPI's CEDARS project and postsecondary agencies will store at the systemwide level the matched UID for any student that attended PK-12 in NC. New UIDs will be issued for students in postsecondary programs who did not attend PK-12 in NC.

Workflow of the proposed statewide longitudinal data system:

- ◆ Discovery Step
- ◆ Request Step
- ◆ Authorization Step
- ◆ Data Selection/Transport Step

Discovery Step: Metadata and Data Dictionary are published as public objects.

Request Step: Describe the query request. If it is an automated report, what are its characteristics, such as frequency of run and expiration? If it is a research project, how long will the researcher be pulling data and what are the expected uses? Does it comply with Data Governance policies for privacy and usage?

Authorization Step: Agency review and approval of project against data use guidelines – this is where business rules are applied to data use.

Data Selection/Transport Step: Using CHILDS, data are queried and results returned via FTP.

Please see Figure A in Appendix A for a graphic representation of this process.

CHILDS

North Carolina's SLDS architecture is based on a heterogeneous federated data system under master data management by a central data hub. Each federated data source (one per agency) will publish metadata that, when joined together at the Central Hub for Integration of Longitudinal Data (CHILDS), will represent the data dictionary for the unified system. Researchers will use a distributed query optimizer and execution engine in CHILDS which will farm out the query to each agency data source and will then join the data on the UID as the key field for education data or SSN for workforce data (via a mapping of UID to SSN). This data query will then be formed on CHILDS and saved until the researcher retrieves it for an agreed to period of time (either online during a session or if it's an automated report running the query it will persist until picked up via FTP by the requesting agency).

The strengths of the system are each agency controls its data in its database of choice and data access adapters are used by the central hub to access each database in the federation. Further, a unified view of the data across agencies allows for complex queries to be formed.

Another way to describe the proposed system is an Enterprise Data Warehouse with five dependent data marts – one at each agency.

Facilitation of cooperative work among the agencies will require data collection, data quality, and the appropriate method for data linking. The NC P-20W SLDS will play the central role in linking the data and making it available to stakeholders in all sectors. Creation of the UID for NCDPI is complete. NCCCS, NCICU, and UNC will adopt the same technology. These agencies will be able to link via the UID.

Matching technology will be necessary to match data from these organizations to NCDES using algorithmic matching. PK-12 in North Carolina cannot mandate disclosure of Social Security Numbers (SSNs) as a condition of enrollment in public school. With each incoming class, the percentage of SSNs provided becomes smaller and smaller.

Business rules that are agreed upon and build upon the standards currently utilized in the Common Follow-up System will demonstrate the value of the linked data system on an ongoing basis. The data dictionary of common elements that cross sector boundaries will foster the interoperability between and among systems. Please see Figures B and C in Appendix A for a graphic representation of this process.

Deliverables

- ◆ Data Broker to publish unified data dictionary and handle queries to each agency system using secure access and within the data governance guidelines
- ◆ Build a NCICU system that will act as a system peer with the four other agencies and aggregate NCICU data

Features

Develop Data Governance Policies

The North Carolina SLDS grant effort is being supported by the five sectors in the NC P-20W Council via a working group that has established the data governance, as well as the system architecture and design.

This work group has drafted a data governance policy and this will lead to signed memoranda of understanding (MOU) across agencies. These MOUs will cover system and data governance and

confidentiality requirements. These MOUs will include sections that define system and data use as well as publication and distribution of information. These MOUs will be developed to ensure that all data exchanges and use comply with both state and federal laws and regulations governing data confidentiality.

P-20W Council, including the NCDPI, UNC, the NCCCS, the NCICU, NCDES, Early Childhood, and the e-Learning Commission (hereinafter referred to as “the members”), is a state-wide resource that must be managed from an enterprise perspective. Accordingly, a manual is being developed to establish the definitive data management policies for the P-20W Council.

These policies apply to all data used by the members of the P-20W Council in the performance of their missions. This data includes any that are collected, stored, processed, and/or disseminated using statewide agency information systems. No employee or contractor of the members may exchange data with any constituent outside the guidelines set forth in this manual. The members will be responsible for determining the data standards used and creating policies and roles for accessibility to secure data.

Develop Research Use Policies

The P-20W Council has authority to set policy regarding data availability, access, and use for analysis and reporting. All policies will be developed such that they comply with both state and federal laws governing data confidentiality.

Objective 3: Automated regular cross-agency reporting (such as UNC’s Freshman Performance report).

Develop procedures and policies regarding establishing protocol for requesting a new regular report, agreement among the members on the required elements of the report, when the report is to be published, and a date in the future to review the usefulness of the report.

Deliverables:

Establish Reporting Protocol

North Carolina also makes a great deal of data available to the public and will continue to innovate in this area. At this time, to offer the most secure data system we do not plan to offer public access to the data hub. The public will access reports that will be available via public websites with data that has been published by the SLDS based on an automated report pulled on a cycle to match the data refresh cycle (typically 45-90 days after a semester ends for postsecondary agencies). North Carolina already provides a vast number of reports via the Common Follow-up System and will continue to do so as automated SLDS reports on the same reporting cycle.

Objective 4:

Provide key data to empower the legislature and NC policymakers to make better decisions concerning funding, program assessments, as well as identifying trends in North Carolina education.

North Carolina, like many other states, faces numerous, varied issues related to educational policy. One of the goals of this project is to publish regular reports that can be consumed by policymakers, the legislature and by the public to provide a more accurate and up to date picture of education in the state. Perhaps more importantly, this project will provide the opportunity for researchers and legislators to answer questions that have policy implications as they arise, thus enhancing their ability to make better informed, data-driven decisions.

Though there is no way to anticipate every question that might arise in the future in regards to state educational policy, the new connections enabled by the NC P-20W SLDS would enable us to answer questions with policy implications like the following:

- ◆ *What percentage of high school dropouts enroll in community college GED and adult high school programs?*
- ◆ *What are the postsecondary retention and graduation rates by high school, high school track, LEA, etc.?*
- ◆ *What are the earnings for high school graduates eight years after graduation by highest educational attainment?*

The ability to provide policymakers with targeted, up-to-date information to shape decisions is invaluable to the state's educational future.

This objective also focuses on training users on the proper use and interpretation of data obtained through the NC P-20W SLDS. Training will empower researchers at the five agencies with the ability to generate the reports being requested from policymakers in a timely and accurate fashion.

Deliverables:

- ◆ **Develop Data Quality Test Plan**
- ◆ **Develop Professional Development and Regional Training Plans** – A comprehensive training program will be developed to support school personnel in meeting two primary goals:
 - building a culture of data quality
 - learning how to use reports or create reports from CHILDS accurately

- ◆ **Develop Sustainability Plan** – System sustainability is a vital part of maintaining a successful LDS. The system will be maintained by the technical staff in the individual agencies. When built the system will be maintained and training will be offered on an ongoing basis for the technical staff. Dedicated technical staff will be responsible for a quality control/audit plan that will be put into place and exercised on a regular basis to demonstrate the system continues to meet all objectives. Professional development for users is an integral part of the success and correct use of the system. Comprehensive training plans will be developed by the Council to meet the needs of the users in each individual agency. We anticipate dedicating staff to assist with professional development and application implementation.

Thus, the program has two components:

- ◆ The first involves a certification program where key personnel are enrolled in an in-depth study of data quality. Participants will learn the importance of, and strategies to build, a culture of data quality at the school, district, and state levels.
- ◆ The second is a dynamic collection of in-person and web-based training sessions. These range in scope from using data standards to the effective use of verification reports. There will also be sessions when participants can propose training topics for ongoing support.

c) Timeline for Project Deliverables

Substantial strides have been made to incorporate unique identifiers for students at the NCDPI through the CEDARS program. The Governor and state legislators are fully supportive of incorporating this initiative over the coming three years among North Carolina educational agencies and the NCDES. All of the aforementioned details involve very specific and interconnected responsibilities to be divided up among responsible parties. Below is a detailed timeline, with each objective broken down by the itemized tasks that will lead to their completion and the parties responsible for each. Much of the work is collaborative, as this is an interconnected and team-based project.

Timeline Summary

The following tables provide an overview of the project timeline by objective. A detailed timeline follows these tables.

