ABSTRACT

*TLDS 360: Tennessee Longitudinal Data System 360 Degree View of the Student.*

The Tennessee Department of Education (TDOE) and the state of Tennessee propose to build a longitudinal student data system that will push the frontier in collection and utilization of P20 data and promote improvements in program administration and educational outcomes. The initiative will significantly increase teacher, school, and district-level use of near real time student data by employing sophisticated, as yet underutilized longitudinal data for predictive and retrospective identification of student achievement growth and academic risk factors. The project will complete the TLDS P20. TDOE's P12 LDS, supported by a 2006 Institute for Education Sciences grant, is already well developed. However, the current TLDS falls short of a complete, efficacious P20 information system. TDOE and its partner, the University of Tennessee Center for Business and Economic Research (CBER), will collaborate with the Tennessee Higher Education Commission (THEC) and the Department of Labor and Workforce Development (L&WD) to expand the P12 LDS to a P20 system. Tennessee's current P12 LDS and business intelligence functions satisfy basic expectations for interoperability and data delivery to local, district and state educators. Proposed improvements to existing business intelligence systems will dramatically expand the scope and depth of accessible data while maintaining stringent security standards. The project will develop a secure and adaptive database architecture that will integrate academic data on teacher/student relationships, attainment, course completion, and test scores, as well as data on health, children's services, mental health, and delinquency. This project envisions and plans to execute what is coined as *TLDS 360: Tennessee Longitudinal Data System 360 Degree View of the Student*. TLDS will incorporate data elements from other child-serving departments and will facilitate more robust characterizations of health, social welfare and behavioral conditions that influence students' progress from earliest child care, through P12 and higher education, and into the workforce.

The TDOE as the lead agency has partnered with CBER, an external academic research organization, which will serve as the conduit for receiving, aligning and coordinating data for reporting and research protocols to achieve project outcomes. As an established third party

contractor, CBER is prepared to integrate data from SAS, Inc. (the vendor for Tennessee's Value Added Assessment System) with data from TDOE, THEC, L&WD, as well as other child-serving departments and agencies. This coordinated approach will permit near- and long-term educational, administrative and research issues to be addressed, including the development of Early Warning Indicators and analyses of teacher effectiveness.

TLDS Governance will be a high-level organization representing all of the partner agencies committed to the success of the project. Initial Project Charters from relevant departments reflect commitments to negotiate data sharing agreements, though much of the data from TDOE, CBER, SAS, Inc., THEC, L&WD, and the Department of Human Services is already available for inclusion in the P-20. The project proposal capitalizes on the current TLDS foundation and positions it for expansion as a nationwide model for multidisciplinary support of student achievement. It corresponds to data system requirements for potential projects funded by Race To The Top grants.

*6. Project Narrative*

TLDS 360: Tennessee Longitudinal Data System 360 Degree View of the Student

"If we remain wedded to the way education is currently provided we cannot imagine other ways…we need some imagination, some fantasy, some new ways of thinking - some magic in fact." Hedley Beare, Professor of Education, Melbourne

'We imagine a school in which students and teachers excitedly and joyfully stretch themselves to their limits in pursuit of projects built on their vision...not one that succeeds in making apathetic students satisfying minimal standards.' Vision for Education: The Caperton-Papert Platform, Seymour

6(a) Need for the Project

Tennessee perennially ranks near the bottom across the states in per pupil spending on elementary and secondary education. This low level of spending is linked, in part, to relatively low levels of per capita income and thus relatively low tax capacity. Accordingly, the state must ensure the greatest possible return to each tax dollar it generates. The state economy has long relied on manufacturing as the foundation of its economic base, but manufacturing jobs continue to disappear. This is not a new phenomenon—in 1968, more than one-third of Tennesseans were employed in manufacturing, but by 2008 only one in ten workers held a manufacturing job. The ever-increasing pace of economic transformation means the state has to work harder and harder to promote economic opportunity.

Education is the cornerstone of economic security for people and families and the economic development communities. Tennessee needs to improve educational outcomes and teacher effectiveness, promote efficiencies in public service administration and delivery, and ensure accountability with the public at large. The project proposed here would put important information in the hands of teachers to do their jobs better and enable research and reporting to meet these needs. In addition, the breadth of the proposed program of work—the length of the educational continuum captured in the database, linkages to state agencies outside of education

and data interoperability—would serve as model for other states developing longitudinal education databases.

*Background*

Tennessee initiated formal development of a longitudinal data system in 2006 when TDOE received a Statewide Longitudinal Data Systems (SLDS) Grant from the Department of Education Institute of Education Science (#R372A05127). The intent was to enable the state to design, develop, and implement a statewide longitudinal data system, referred to as the Tennessee Longitudinal Data System (TLDS), to efficiently and accurately manage, analyze, disaggregate, and use individual student data, consistent with the Elementary and Secondary Education Act of 1965, as amended (20 U.S.C. 6301 et seq.).

TDOE conducted in-depth research into its K-12 information system environment, national standards and best practices in the field, and reviewed status of work already under way to address many of the grant objectives. TDOE engaged Oracle Technologies for the data warehouse infrastructure and Business Intelligence (BI) Reporting Tool and implemented a design bringing together a significant amount of education data in a common environment. TDOE also established procedures that have improved confidentiality of student records, implementing a new unique student identifier, so cross-system and cross-year data are immediately accessible. The process for assigning unique student identifiers does not involve school district interaction. Numbers are automatically generated at the State Education Agency (SEA) and downloaded into school district databases. Students' confidential information is stored in a separate database and only accessed when data are imported into the warehouse. In compliance with Family Educational Rights and Privacy Act (FERPA) regulations, TLDS provides student-level data for longitudinal analyses without disclosing student identifying information. The warehouse serves a range of users who report varying degrees of satisfaction with the current BI tool. A variety of users obtain data from the warehouse, including TDOE staff, Tennessee Higher Education Commission (THEC), external researchers, managers, and policymakers.

Tennessee's initial SLDS grant also facilitated and prompted connections between K-12, higher education and workforce data. Through a partnership among TDOE, THEC and CBER, a teacher data warehouse was created utilizing the TDOE warehouse data and connecting TDOE data on teacher placement with THEC data on teacher preparation and CBER workforce data. The creation of the teacher data warehouse provides a platform for the next phase of TLDS growth.

Tennessee envisions the next iteration of TLDS as a primary driver of data and analysis to enhance the state's efforts on teacher effectiveness, supporting a P-20 system, revamping and integrating standards and assessments and better aligning targeted interventions. This project will allow these outcomes by addressing four significant needs of the state: First, to train Local Education Authorities statewide to fully utilize the K-12 SAS-based data and expanded data available through the P-20 system; second, to complete its P-16 and P-20 system; third, to advance to a 360 degree view of its students (*8. Appendix A2*); and fourth, to enhance performance across state agencies.

(1) Fully utilize K-12 TLDS data.

It has been well documented that educational value-added assessment accounts for any influence of socio-economic factors that are consistent across time, *if* the assessment is based on multivariate, longitudinal analyses of each student's entire vector of prior academic achievement scores. Tennessee has an established history of research about accelerators and impediments to student progress already running at the teacher level. Interface allows authorized users to access results from analyses that measure the impact of districts, schools and teachers on student academic progress by subject level and by achievement level of students, plus individual student projections to a variety of academic milestones students face. Thus, these results offer educators the opportunity to focus on effective educational delivery, which will result in appropriate academic progress for all students.

However, there are unexpected environmental conditions that can alter academic trajectories of individual students. Examples: Entry into protective custody, incarceration of a parent, family

lost jobs, death or serious illness of a parent or other care giver. Any of these would most likely have an unsettling effect on a student's capacity to engage in appropriate academic behaviors.

Building on expertise accumulated through years of measuring of schooling influences on student academic progress and making projections for future student success, this proposal will link measurement expertise across state agencies to identify combinations of strategies that are successfully neutralizing currently unpredicted external forces for students. A 360 degree student view (*8. Appendix A1* and described more fully in (3)) and dashboards to support this proposal go beyond information sharing across state agencies. Dashboards will overlay the state's evaluation of coordinated inter-agency efforts with empirical research tied to student outcomes.

Tennessee has in place an infrastructure to deliver to educators indicators collected within the school environment through a user-friendly interface. Thousands of Tennessee teachers and principals already have responsibility-specific accounts to a secure-access drill down delivery system. With the state's commitment to increase access to all appropriate school personnel by fall 2010, the TVAAS restricted website is a reasonable, cost effective solution to delivery of the 360 degree student view for educational uses. Missing from this existing delivery is access to student/family data from other state agencies that can trigger additional educational support for students whose academic success is threatened or potentially compromised by unexpected events occurring outside of education. Proposed additions to the existing infrastructure will increase the capacity to do the following:

1) Provide principals and teachers with an early warning when situations that might impede student performance occur and activate a monitoring of a student's indicators of academic engagement (e.g., grades, discipline, and attendance). This would allow for additional intervention, should evidence accumulate to warrant it. Individual student multi-agency transfer into the system will trigger the following:
    a. Appropriate principal/teacher notification of change in student environmental/family status (Phase I)
    b. Appropriate automated monitoring of academic environment behaviors to assess accumulating risk (Phase I)

c. Revised individual student probabilities for academic success, given an individual student's change in status. (Phase II)

2) Provide feedback to other appropriate state agencies regarding specific future academic risks that might exist due to an individual student's change in status (e.g., failure in grade/missing graduation target). (Phase I)
3) Provide aggregate school level feedback to the school system so system level supports can be increased for specific schools as level of severity of potential academic failure increases. (Phase I)
4) Provide aggregate school system level feedback to appropriate state agencies regarding counts of student/family overlapped services to improve efficiency of service delivery. (Phase I)
5) Provide empirical evidence of whether integrated delivery of services has successfully impacted students' academic performance so the unexpected environmental intrusion is neutralized. (Phase II)
6) Identify inter-agency actions that were successful and actions that need improving. (Phase II)
7) Link to forecasting for future revenue requirements. The University of Tennessee Center for Business and Economic Research (CBER, the external research partner for this project) and SAS Institute partnership will also improve forecasting capacity within the state regarding need for targeted differentiated future funding to focus on measured effective interventions for highly at risk students. (Phase II)

Phase I will be accomplished in the initial year and Phase II will be added after appropriate research using data collected in Phase I.

(2) Complete TLDS P-16 and P-20: The second purpose of this application is to expand and improve TDOE's P -12 TLDS to a P-20 system to allow data to be collected, archived, combined, analyzed and used to promote data driven analyses and interventions for continuous improvement for learning standards, curricula, instructional processes and programs, professional development, post secondary educational programs and workforce program improvements. Combination of the current TDOE LDS,THEC systems and other data sources

will track an individual's academic and educational achievement, and also post-education and career experience. System tools will support practitioner and researcher needs and allow for retrospective (e.g., determination of which curricula were effective) and prospective uses of data (e.g., projections of future capacity and curricula requirements in the education system, predictive studies of student outcomes, and early warning signals for achievement challenges). The current status of the state's TLDS is displayed in *10. Appendix C.—Current Status of State's Longitudinal Data System.*

A core element of TLDS—the P-20 student-level database—will be an invaluable tool that can be used to address an array of important education, administrative issues and policy questions. In the context of teacher effectiveness, only standard metrics like student progression, dropout rates, test scores and value added assessments can be utilized. Extending P-20 to include child care prior to pre-kindergarten and to workforce outcomes, like employment status and earnings, will accommodate a richer analysis of teacher effectiveness by controlling for characteristics and experiences of children before they enter formal schooling and tracing through workforce outcomes that transpire after graduation.

Data Quality: The TLDS will implement a software application data cleansing tool (*10. Appendix A2*) through a third party trusted vendor which will securely move certain student records from a sending agency to a receiving agency authorized by FERPA. This system will track a student's lifecycle. When a student transfers from one district to another, that data will be moved from one LEA to the other LEA electronically – immediately and securely. The same will be true when a student moves to Postsecondary education. This data cleansing tool will also assist with student drop out data. Tennessee's dropout rate may be reduced because there will be better tracking of interstate enrollment.

This tool supports serve both the needs to PK-12 and Postsecondary systems. The system translates data from PK-12 sets into formats preferred by Postsecondary users, such as PESC High School Transcript XML or SPEEDE EDI.

P-16. The Tennessee Higher Education Commission (THEC) currently has a unit-record student information system with data back to 1995. The information comprising this system includes enrollment, financial aid, completions, and lottery scholarship information. This student information system has served THEC well in research and reporting on policy issues limited to public higher education.

THEC enjoys excellent working partnership with Tennessee Department of Education. The two agencies have collaborated on many research projects in the past. Having the two data systems separated, however, has limited the types of research studies that have been conducted up to this point. By merging the data into a statewide longitudinal data system, a greater understanding of education in Tennessee will be achieved.

Some of the policy questions that can be answered with the statewide longitudinal data system include:

- How do the state's high school graduates persist and perform in higher education?
- What pattern of high school course-taking leads to success in higher education?
- What is the predictive value of the state's tenth grade assessment?
- Who needs developmental education courses in reading, writing and math?
    - How is this related to high school course taking?
    - How is this related to tenth grade test results?
    - How is this related to scores on the GED examination?
- How do under-represented populations persist and perform in higher education?
    - Adults
    - Males
    - Low-income
    - GED recipients
    - Racial/ethnic minorities
- How do the findings inform high school and adult education reform, including development of college-ready standards in the key academic skill areas?
- How do financial aid packaging practices affect college choice, persistence and academic success of low-income students?

- What are the actual graduation rates, adjusted for mobility across systems and other states?
- How do various student retention strategies impact student success?
- What is the employment and wage status of graduates by program of study and degree level?
- Are we graduating sufficient numbers of students in fields with high job vacancy rates?
- How do graduates of various types of teacher preparation programs perform?

The education data warehouse contributes to our store of substantive knowledge and it will increase the speed and routinization with which cross-cutting projects can be completed, leading to increased capacity for research and reporting that is P-16 in nature.

eTranscripts: Since student transcripts are the quintessential longitudinal student record, the most significant impact a state education agency and the U.S. Department of Education can have on the quality of the nation's longitudinal education records is to ensure that schools have the capacity to create and exchange correct, certified and timely student records. TLDS' eTranscript application will permit high schools, the state, legislators, postsecondary institutions and the public to assess where Tennessee high school students apply to college, where they are admitted, and where they actually attend. This system will also simplify transfer of academic records between high schools when students move from school to school, and will allow postsecondary institutions to quickly update academic records for newly admitted students. With appropriate approvals, transcript data from colleges can even be sent back to originating high schools so school districts can assess their own college preparation efforts. Recipients can make faster and better informed decisions about incoming individuals, such as in cases of college enrollment and workforce readiness.

P-20: With completion of P-20 TLDS, Tennessee Labor and Workforce Development (L&WD) will have access to quality decision making data to substantiate the value of federally funded programs within its organization. These data will allow L&WD to demonstrate what transpired in students' lives after completing their education. Programs include, but are not limited to, completion data for GED Programs, Adult Literacy Programs, Training Grants, Pell Grant

Applicant Information, Work Force Training, English as a Second Language Training, Unemployment Insurance data, and Tennessee Teens to Work data.

Through successful collaboration with L&WD, TLDS P-20 will boast the abilities of:

- Student Identification Element – tracking individualized data beginning at the fundamental level through an educational student unique identifier throughout their education experience and into the labor force. This identifier will be used across P-12, Community College System, University System, Workforce Tracking and more.
- Adhering to Data Standards - Postsecondary and Higher Education typically involve a high percentage of students whose P-12 education occurred outside the state where the institution is based. TDOE's Master Person Index ((MPI, described in 6(b)(iii)) and L&WD will address this issue by developing algorithms to match student data elements across multiple databases and data fields.
- Subject and Skills Data – L&WD maintains data on individuals and students. The P-20 TLDS will have the ability to consistently manage subjects, skills, intensity and other information regarding courses consistently across the entire system.
- Managing Complexity – Many students are dual enrolled whether it is P-12 to P-16 or P-16 to the Workforce. New skills will enable citizens to remain successful contributors to their communities and the world. Many of these individuals go on to become teachers in the P-12-P-20 System.
- Systems Interoperability – Interoperability will be addressed through Data Security sharing agreements and use of BI tools that allow distraction and reporting of data from multiple databases for consolidation purposes via a business intelligence tool selected during the grant. Presently student level data is available through multiple heterogeneous, autonomous, distributed data sources containing related and duplicated information. Resolution for solving heterogeneous multi-database systems requires discovering and managing certain types of knowledge facts. The TLDS P-16/P-20 will operate from a framework for managing knowledge for interoperable access and use of heterogeneous database systems. The framework will utilize knowledge bases at the integration and component sites. Key issues for resolving heterogeneity are acquisition of appropriate

metadata and discerning relationships among constructs of different database schemas. Management of this knowledge in a modular and efficient way is crucial for building an interoperable database system. A multi-database prototype system utilizing the techniques in this proposal is being developed.

(3) Advance to a 360 degree view of students. Tennessee's proposal is to go much further than extension of TLDS to P-16/P-20. It is to develop, provide appropriate access to, and effectively use a comprehensive TLDS to achieve a 360 degree view of students. Many conditions in addition to students' academic experiences influence learning, among them: of the almost 1.5M student age Tennesseans under age 18, over 100,000 (9.6%) have a disability; about 350,000 (38.8%) receive or are eligible for Free or Reduced lunch; 8.4% get Families First grants; 27.8% get Food Stamps; and over 670,000, almost 40%, are on TennCare. Child abuse and neglect contribute negatively to the learning experiences. Unfortunately, recent statistics indicate that 11.6% of the reported cases of abuse and neglect were substantiated. (2009 Kids Count Data Book)

In this project, TDOE will bolster TLDS significantly with information from other child serving agencies and the adult Department of Correction in order to inform best practices and help reduce achievement gaps during the near- and long-term. The current TLDS and expertise for data management at CBER create a tremendous base from which the state can align requirements for data transfer, identify data elements and expand utility of the system statewide for informed policy analyses.

The near- and long-term results of the project will permit analyses that validate or refute the extent to which untoward conditions affect educational attainment and other life experiences when matched with student/teacher data about academic achievement. An interagency database built around TLDS will allow analysis of the effectiveness of programs on recidivism, post-prison pursuit of education, and ultimately, labor market outcomes like earnings and unemployment rates.

In addition to THEC and L&WD, agreements will be negotiated for relevant data sharing with these child-serving departments and agencies:

- Department of Children's Services (DCS)
- Department of Health (DOH)
- Department of Human Services (DHS)
- Department of Mental Health and Developmental Disabilities (DMHDD)
- Department of Correction (DOC)
- Bureau of TennCare (TCB)
- Tennessee Commission on Children and Youth (TCCY)

Lead responsibility for achieving data sharing agreements will reside with a policy analyst in the Governor's Office of Children's Care Coordination (GOCCC), serving as Governance Manager for the Project. GOCCC leads and facilitates cross-departmental coordination, multi-departmental collaboration, policy analyses and system reforms. It is charged with translation of science into policy.

The sequence and integration of the service aspects and conditions children experience are depicted in 6 (c) Timeline for Project Outcomes.

Opportunities for policy informed research are limitless under this model of multi-departmental and interagency information transfer. Constraints include federal and state confidentiality rules. However, constraints of FERPA are mitigated by a relationship with CBER, an established trusted third party contractor. HIPAA Business Associate agreements will be negotiated sequentially with DOH, TennCare, and DMHDD, which also has federal substance abuse laws to consider. The state will work within these constraints and others to contribute to a rich data base for analysis by sequencing the order in which agreements are negotiated from easiest to most difficult to achieve.

Multi-departmental data will reside at CBER, which shares fiber optic connectivity with TDOE, THEC, Office of Information Resources (OIR) and agencies depicted in *8. Appendix A3.* CBER is partnered with DOE as the external research organization for this project. CBER has

developed other integrated data bases (including with L&WD, DHS, THEC and DOE) and has an extensive track record in conducting and supervising research projects including annual and long-term economic and fiscal forecasts for the Governor and the state; research on education issues and funding and related public service delivery; linkages between higher education and the economy.

Agreements among TDOE, child serving departments and CBER to collaborate on policy issues and data sharing will permit ability to determine, among other outcomes (1) best investments relative to IDEA Part C early intervention services, PreK and Child Care on different levels of academic achievements and how different methods of delivering education affect these outcomes; (2) how conditions and situations such as health care, foster care and home visitation services and other factors affect educational performance; (3) how, through information exchange, each department can perform its functions more effectively by structuring its relationship to TDOE and Local Education Agencies to support children to achieve their highest potential; (4) how long-term contributions to education, health, and economic returns to the state differ among cohorts of discreet groups such as children in foster care, in children's special services, children eligible for child care subsidies, gifted children, and children in urban versus rural locations.

(4) Enhance Performance Across State Agencies: TLDS P-20, when linked to other agency data, will support improvements in program administration and policy, both within DOE and across state government in Tennessee. These improvements can reduce taxpayer costs, enhance service delivery, support program accountability, and promote better educational and workforce outcomes. Once completed, the integrated interagency database can help reshape the way government works in Tennessee.

Opportunities for improvement of program administration and program outcomes can be placed in four broad and potentially overlapping categories.

(1) Administrative Improvements: State government agencies in Tennessee have migrated a substantial flow of data to electronic systems. But many paper legacies remain in the state's information and management systems, and these systems are not linked in a fashion to support administrative decision making. This project would overcome that obstacle.

(2) Accountability: TDOE has two primary systems of public accountability. The first is TVAAS. The longitudinal database underlying TVAAS supports a linkage between teachers and students and enables identification of the educational value added to the student by the teacher. This system currently relies solely on school-level data. The premise of TVAAS is that background characteristics of a student—raw intelligence, family characteristics, peer influences and other factors—are stable and consistent and therefore do not affect changes in student performance from year to year, i.e., value added from the education system. In reality a child's personal and social circumstances are subject to ongoing change. For example, a third grader's parents might go on welfare, a parent might be imprisoned or the child might be placed in the custody of the state and then a foster home. Certainly these changing individual circumstances can be expected to affect a child's performance in school, and TLDS allows these other factors to be fully integrated into the value added model.

An interagency database built around TLDS will allow TVAAS to be recast to include information on the changing circumstances of a child. This will improve the accuracy of the system in evaluating teacher effectiveness. It will also allow identification of risk factors for students, enabling more effective interventions to promote student academic performance and wellbeing.

A second accountability system is the Report Card on Tennessee Schools, produced annually by DOE. This report, and its companion supporting resources on the Internet, includes state, district and school-level information on achievement, demographics, discipline and educator preparation. However, data are limited to PreK-12 education. There is currently no counterpart report card for post secondary education, Department of Children's Services'

schools and Youth Development Centers, Department of Correction education and training programs and other agency educational programs.

The project proposed here will enable development of a Statistical Abstract of Education in Tennessee that would encompass the full range of educational services provided by the state. This same reporting mechanism could utilize interagency data to summarize linkages between educational outcomes and other outcomes, including workforce status and utilization of public services. For example, what do graduates of Tennessee high schools earn relative to graduates from the state's community colleges and universities? How do unemployment rates for high school dropouts compare to unemployment rates for high school graduates? What is the educational attainment status of Tennesseans who utilize services from TennCare and Families First?

(3) Teacher Effectiveness and Student Growth: Teachers are perhaps the most influential factor in affecting student performance. As noted above, TVAAS already gauges teacher performance. Linking TLDS to workforce and public service utilization outcomes can enrich the scope of TVAAS.

(4) Outcomes Assessment: Education and child related services are costly to provide and returns to the state's investments in these services are not well known. An interagency longitudinal database will allow for rigorous examination of program effectiveness across state government in Tennessee. For example, DCS provides interventions and services ranging from foster care and adoption to schools, Youth Development Centers and health services. Other services to the same child might be provided through DHS and TennCare. Controlling for student and family/caregiver characteristics, how do these state services affect a child's educational outcomes and longer-term status in the labor market?

Another example is DOH and TennCare, which provide services to communities and families, including programs to reduce diabetes and promote physical fitness, and specific health care services to individuals within a family. These programs promote individual

wellness, in turn facilitating participation in formal educational programs and the labor market. The effects of these services on educational investments and labor market outcomes can be assessed when coupled with data from DOE, THEC and L&WD.

The longitudinal database can also be used to examine the role education plays in affecting other outcomes. For example, research has shown that parental education, especially educational attainment of mothers, has an important bearing on child wellbeing. Interdepartmental data would allow analysis of the impact of maternal education, public service utilization and workforce status on infant mortality rates, vaccination rates, teen pregnancies, and take-up rates for programs like WIC and child special services.

The four core components of this project—enhanced content and utilization of the current sophisticated TLDS capacity by teachers, schools, and school districts; completion of TLDS to a P-20 system; alignment of information from other child-serving departments with that of DOE to achieve TLDS 360, and enhanced performance across state agencies—will permit the state to move to a new level of competency relative to influences on student achievement. The project is a major puzzle piece contributing to the state's Race To The Top proposal. It will support School Improvement Grants and the Teacher Incentive Fund. It will inform planning for Investing In Innovation when the RFA for that program is developed.

It corresponds to assurances of the State Fiscal Stabilization Fund. Relative to

- Teacher Effectiveness: The project will provide teachers with data dashboards that will provide not only standard educational metrics and value added assessment information but also information from other child serving agencies that influence a student's ability to learn, generating a 360 degree view of the student.
- Support of a P-20 System: The project expressly links the current TLDS with THEC to answer the policy questions above that benefit both Education and Higher Education. TLDS will link L&WD's programs such as data for Pell Grant Applicant Information, GED Programs, Work Force Training, Unemployment Insurance data, Adult Literacy Programs, Training Grants, English as a Second Language Training, and Tennessee Teens to Work data.

- Standards and Assessments: TLDS has an established history with TVAAS of providing multivariate, longitudinal analyses of every student's entire set of achievement scores, which are widely used by teachers and throughout the education system. This project builds on the current TLDS and strengthens it.
- Targeted Interventions: By aligning data from the child-serving agencies with the TLDS to create a more comprehensive picture of student cohorts, schools will be better able to close achievement gaps among students and implement best practices.

Additionally, the project takes into consideration criteria for one of the stakeholder collaborators, Department of Health's proposal to the Centers for Disease Control and Prevention Recovery Act funded program, "Communities Putting Prevention to Work", the purpose of which is to promote broad-based policy, systems, organizational and environmental changes in communities and schools.

6(b) Project Outcomes Related to System Requirements and Implementation

TLDS will integrate heretofore-scattered data silos to better connect teachers, principals and superintendants to data about their students, improve operations of DOE and participating agencies, advise education policy and management, and investigate the 360-degree-impact of education on lifecycle outcomes. These objectives require three major outcomes: (i) adaptive and secure data architecture (ii) rich, multidimensional data on students, teachers, and schools, and (iii) access platforms for local school systems, policymakers, researchers, and the public. Proposed products and features related to (i) through (iii) are outlined below, along with their contribution(s) to specific data system capabilities and elements. See section 6(c) *Timeline for Project Outcomes* and *8. Appendix A4: Itemized Timeline by Outcome* for detailed timing of subtasks related to each outcome.

6(b)(i) System Architecture Products and Features

TLDS architecture refers to the entire framework supporting integration, storage, and management of student data. Rather than construct architecture components around available data, TLDS architecture will be an outcome in and of itself, designed to be forward-looking and adaptive to new data sources and collaborative opportunities with other information systems and

states. TLDS architecture will receive and integrate data from multiple sources and information technology systems, and transform data into a foundation for reporting and research. Much of the architecture will be developed and implemented through Year 1, and TLDS will be ready to store integrated data early in Year 2. Some architecture elements may be modified as additional data is integrated throughout Years 2 and 3, with continuous improvement thereafter.

Contribution toward required data system capabilities and elements: prudent architecture design and implementation will lay the foundation for all data system capabilities and elements, particularly the internal quality and integrity of data.

1. Security features: before sensitive data are merged, security systems will be iteratively designed and tested for data receipt, storage, dissemination, backup, and recovery. Critical first steps will be to (1) identify best practices in other SDLSs, and (2) advance those best practices with guidance from CBER, the Office of Information Technology at the University of Tennessee, SAS, Inc., and integrated health information systems currently being developed in Tennessee. Security will be continuously evaluated and improved throughout the life of TLDS.
2. TLDS functional requirements (product): TLDS directors, managers, and staff will define and document the necessary functions of TLDS.
3. Capital products: hardware and infrastructure will accommodate security needs, high-volume storage, and high-speed transfer. Servers and storage will be in place at DOE and CBER throughout development and operation phases, and will be upgraded as needed.
4. Data taxonomy, structure, and documentation features: TLDS staff and subcontractors will design structural components of the database itself in accordance with functional requirements and NCES standards and guidelines for LDS interoperability, metadata, taxonomies, and documentation.
5. Data import design features: TLDS staff and subcontractors will design and implement data import pathways, in accordance with taxonomies, data integrity controls, and governance rules.

6. System evaluation products: a web-based feedback application will connect data warehouse staff with intermediate- and end-users to support continuous improvement. This product will allow bug reports and other complaints to be reported and resolved systematically. Additionally TLDS management will oversee regular, internal reviews of architecture features, and solicit external reviews from stakeholders in local, state and federal organizations.
7. Internal audit features: audit procedures will be designed to seek, report, and correct likely errors in the data. Audits will be added or modified as additional data are incorporated.
8. Incoming data integrity features: Business Intelligence systems with existing LDS elements will be upgraded to enhance internal operations and ensure that audited and cleaned data are delivered to the broader TLDS. Data warehouse staff will interact with DOE, SAS, Inc., and participating agencies to improve data delivery mechanisms and the quality of incoming data. Where possible, data integrity procedures, middleware, and metadata definitions will be implemented at the agency level. The Steering Committee (described in section 6(d)) will (1) determine the degree to which agencies' information technology can be efficiently adapted to meet TLDS data needs, and (2) determine the most efficient pathways for data transfer between agencies and TLDS

6(b)(ii) Data Integration Products and Features

Data will be integrated in phases, following the resolution of security protocols and implementation of TLDS architecture (see *8. Appendix A3: TLDS Outcomes* for a stylized diagram of data inputs and outcomes; see section 6(c) and *8. Appendix A4 Itemized Timeline, By Outcome* for specific timelines.) During Phase 1, longitudinal data systems in service at DOE, CBER, SAS, Inc., and other partnering agencies will be merged to produce a P-20 longitudinal data system that meets and exceeds many required capabilities and elements of grant-funded data systems. This phase is expected to run through the first quarter of Year 2. During Phase 2, public service agencies with initial agreements to participate in TLDS (see *11. Appendix D--Letters of Support*) will formalize data sharing agreements and begin contributing data to TLDS. Also during Phase 2, an advanced student identification system (referred to below as a master person index, or MPI) will be utilized to match individuals across otherwise irreconcilable

datasets. MPI matches will complete the P-20 LDS and facilitate integration of Phases 2 and 3 data. The MPI and Phase 2 data will be integrated during Year 2. During Phase 3 and Year 3, data from additional agencies will be integrated pending finalization of data sharing agreements.

Contribution toward required data system capabilities and elements:

- Student-level longitudinal data from preschool through postsecondary education and into the workforce.
    - Link between students and teachers.
    - Teacher credentials, including experience, certification, and education.
    - Unique statewide student and teacher identifiers that mask sensitive, identifying information.
    - Student enrollment, demographic, and program participation information.
    - Student mobility and attrition information.
    - Annual test records for students.
    - Information on untested students.
    - Student-level course enrollment records and course grades.
    - Student-level college readiness (ACT) scores.
    - Student-level data on transitions to postsecondary institutions and postsecondary attainment.
    - Internal quality and integrity of data.
- Individual-level longitudinal data on public service utilization. These elements are beyond the scope of the required capabilities and elements but represent tremendous added value to Tennessee's current P-12 LDS and proposed Phase 1 P-20 LDS.

1. Phase 1: P-20 TLDS. Tennessee's existing LDS elements are housed in isolated information technology and governance systems, and no previous attempt has been made to integrate them into a substantially more valuable and complete LDS. During Phase 1, data from pre-K, K12, postsecondary, and workforce information systems will be merged within a secure and unified architecture, in accordance with a collaborative model of governance.

Specific data features and products related to this Phase of TLDS development are itemized below.

- Unique student identifier and masking features. TLDS will use standardized identifiers (state- and district-assigned student IDs, Social Security numbers), names, and unchanging demographic characteristics to link individuals' data longitudinally and across reporting units. Then, a unique identifier will be generated for each individual. This identifier will have no meaning and entail no privacy risk outside of TLDS. Following successful identification, some private data (including Social Security numbers, if applicable) will be masked.
- Integrate existing longitudinal elements from DOE, CBER, TVAAS, and NCES to form a preliminary P-20 LDS (product). All data elements, unless noted otherwise, are expected to recur on an annual or more frequent basis.
  - Existing DOE data, all dating back to 2006: K12 student achievement, enrollment, demographics, and other available information (disciplinary, extracurricular, and college readiness, for instance) from the Education Information System (EIS) and Statewide Student Management System (SSMS); K12 teacher assignments and credentials from the Personnel Information Reporting System (PIRS); K12 teacher-student match.
  - Existing data at CBER: six unique datasets and surveys on child care and public welfare services, some dating back to 1996; teacher assignments and credentials dating back to 2001 from the CBER-assembled Teacher Education Data Warehouse (TED); postsecondary student data from THEC, representing all higher education institutions in the State (including public and private two- and four-year colleges and universities) and dating back to 1997; earnings and employment data from statewide Unemployment Insurance (UI) records, dating back to 1995. Note that multi-state collaboration is possible through external THEC and UI relationships.
  - Exiting TVAAS data (maintained by SAS, Inc.): K12 student achievement, enrollment, and demographics, dating back to 1990; Teacher-student match for tested courses, dating back to 1990; ACT scores, dating back to 2000.
  - Existing NCES Common Core of Data: School- and district-level data on enrollment, demographics, achievement, attainment, and finance, with some fields dating back to 1986.

2. Phase 2: P-20 TLDS Enhancements

- Develop and implement the Master Person Index (MPI). The MPI feature will improve on the Phase 1 identification system and expand the scope of TLDS to include data without Social Security numbers and other common identifiers. The MPI will permit the seamless integration of new data in Phases 2 and 3, and will provide robust validity checks of Phase 1 identifiers. The MPI will be developed by the State of Tennessee Office of Information Resources (OIR) simultaneously with development of TLDS.
- Integrate data from agencies with formal agreements to participate in TLDS. See *11. Appendix D--Letters of Support* and initial Project Charters. Anticipated highlights from Phase 2 agency data are described below. Actual Phase 2 data will be subject to final data sharing agreements and may include additional agencies not named below.
  - Department of Health: birth certificates, immunization records, and children's special services.
  - Department of Human Services: free or reduced lunch, child care center quality, child support, and welfare beneficiary information
  - Department of Children's Services: foster child indicator, foster case information, juvenile justice involvement and youth in transition data.

3. Phase 3: P-20 TLDS Enhancements (ongoing)

- Integrate data from additional agencies, pending formal agreements to participate in TLDS. Anticipated highlights from Phase 3 agency data are described below. Actual Phase 3 data will be subject to final data sharing agreements.
  - TennCare (Tennessee's Medicaid program): enrollment and benefits for eligible children and families.
  - Department of Corrections: offense histories, recidivism and probation outcomes: GED outcomes while incarcerated, juveniles in the general correction population and offenders up through P-20.
  - Labor and Workforce Development: unemployment compensation payments.

- Department of Mental Health and Developmental Disability: outcomes for early intervention programs and system of care enrollees.

6(b)(iii) Reporting and Research

TLDS, as proposed, will dramatically improve the depth, scope, and quality of data available to schools, Local Education Authorities (LEAs), the public, DOE, and partnering agencies. Business intelligence features and restricted access portals will be in place by the end of Year 2, and expanded to include additional data and public portals thereafter. In addition to operational efficiencies, TLDS will facilitate rigorous research and policy analysis. Research support features and TLDS access protocols will be in place by the third quarter of Year 3. Reporting and research outcomes, as well as supporting features, are described below.

Contribution toward required data system capabilities and elements

- Web-based access to detailed student data available for teachers, principals and superintendents.
- Enables exchange of data among agencies and institutions within the State and between States so that data may be used to inform policy and practice.
- Timely reporting to parents, teachers, school leaders, and the community at large.
- Facilitate *EdFacts* and State Fiscal Stabilization Fund reporting to the U.S. Department of Education

1. Business intelligence (BI) features:

- Aggregation and access rules: Members of the TLDS Steering Committee (see section 6(d)) will negotiate aggregation and access rules between data sources and integrated data users. The scope and depth of data access will be user-specific and subject to data sharing agreements, aggregation rules, metadata definitions, and abundant security measures, all of which will be in strict accordance with FERPA, HIPAA, and other applicable laws. Aggregation rules and secure, user-specific access will be programmed and managed by the BI software vendor.

- BI software is a critical layer between physical data and web-based portals. Current DOE BI systems were launched following the 2006 receipt of a Statewide Longitudinal Date System grant, #R372A05127. This software moved the State's longitudinal data system forward and is a valuable resource for Tennessee educators. Current BI systems, however, are inadequate to support the public and inter-agency products outlined in this application (see "Web-based Portals" below) since data are only available to two individuals within each Local Education Agency (LEA). Funds awarded under this grant will be used to (1) upgrade current DOE Oracle databases and (2) tailor state-of-the-art SAS, Inc. software to improve on the reporting capabilities of the existing BI system. These efforts will facilitate data exchange among agencies, within DOE, among LEAs, among schools, and between DOE and the public. A web-based portal is currently available through SAS for very limited data. The project will explore using this platform to expand dramatically data available to teachers, principals and superintendents throughout all LEAs in Tennessee.

2. Web-based portals (products): BI software will facilitate presentation-layer interfaces for schools, LEAs, the public, agencies, and DOE. End-user interfaces will be web-accessible dashboards to TLDS data. Currently, SAS, Inc. maintains secure portals to student test records, projections, and other TVAAS data. TLDS managers will leverage this resource to expand the accessibility and scope of current web-based portals.

- Public portals: these portals will facilitate public reporting and improve the ease and accuracy with which families and community members can access aggregate education information. Products will include statistical abstracts and interactive tables on school- and district-level enrollment, socioeconomic indicators, achievement, personnel, and finance.
- Agency portals: secure data will be available to participating agencies (subject to data sharing agreements). For example, a foster child's case manager at the Department of Children's Services will be able to determine if a child's education records followed him to his new school. These portals will generate inter-agency synergies, improve efficacy of public service provision, and add tremendous value to Tennessee's existing longitudinal

data systems. SAS, Inc. will host webinars to train agency personnel on the effective use of TLDS dashboards.

- School, LEA, and DOE portals: secure data will be available to school system administrators, principals, teachers, and families. Portals will be designed to aid school and district operations. In-service TVAAS dashboards developed by SAS, Inc. are user-friendly interfaces designed to deliver timely, important data to educators. TVAAS restricted-access portal is a reasonable, cost effective mechanism for delivery of the 360 student view for educational uses. Thousands of Tennessee teachers and principals already have secure, responsibility-specific TVAAS accounts with the ability to drill down to a fine level of detailed student information. The state has committed to increase TVAAS access to all appropriate school personnel by fall 2010. This expansion will be concurrent with TLDS development. Missing from existing TVAAS delivery is access to student/family data from other state agencies that should trigger additional educational support for students whose academic success is threatened or potentially compromised by unexpected events occurring outside of education. TVAAS/TLDS dashboards will include data on public service utilization (subject to data sharing agreements), and improve educators' responsiveness to student circumstances. SAS, Inc. will host webinars to train school, LEA, and DOE personnel on effective use of TVAAS/TLDS dashboards. Ultimately, these portals will communicate "early warning" flags to LEA and school personnel when at-risk behaviors (low attendance, accumulating suspensions, low achievement, and so forth) collectively signal the need for intervention and support.

3. Research support features: the research support layer will be designed to securely access micro-data for research purposes. The Steering Committee, in partnership with CBER and data warehouse staff, will develop research access protocols (including procedures to mask private data), evaluate incoming research proposals, and monitor approved research projects, in strict accordance with FERPA, HIPAA, and other applicable laws.

4. Research reports and policy analysis (products): TLDS, as envisioned in this

application, will trace a new frontier for the design and implementation of longitudinal data systems. TLDS will support a wealth of research questions currently precluded by data limitations. DOE and CBER researchers will produce reports that guide policymakers and administrators in identifying and adapting successful education delivery systems. Studies will analyze, for instance, determinants of teacher quality, the value of effective teachers, and short- and long-term efficacy of education policies like teacher performance pay, charter schools, as well as any innovations supported by Race To The Top funds. Effectiveness will be measured by K12 outcomes like test scores, high school attainment, and changes in critical achievement gaps, and also by adult outcomes like college attainment, employment, earnings, incarceration, and utilization of health and welfare services.

6(c) Timeline for Project Outcomes

Timelines and primary responsibilities for outcomes and subtasks outlined in 6(b)(i) through (iii) are described below. See *8. Appendix A4 Itemized Timeline, by Outcome* for further details, including specific tasks, dates, and shared responsibilities. Y1-Q1 refers to the beginning of year 1, quarter 1 of three-year window over which funds will be allocated. Year 1, quarter 1 will commence the calendar month following announcement of grant awards.

During Y1-Q1 and Q2, personnel will be hired and a data architecture subcontractor will be identified. These resources will contribute to all outcomes and tasks. Personnel will be hired by Co-Project Directors at TDOE and CBER. The subcontractor's main function will be to aid in design and implementation of a secure and flexible system for importing, storing, and managing longitudinal data from disparate sources. The subcontractor will also serve as a resource during initial waves of data integration and reporting. Also during Y1, the Steering Committee will be established, bringing together representatives from each partner agency and TLDS staff. Representatives will have expertise in both agency-level administration and data analysis. Anticipating frequent meeting during the development stage of TLDS, this committee will meet at least twice yearly to coordinate data sharing and acquisition agreements, evaluate internal and external research proposals, discuss opportunities for inter-agency cooperation, and provide feedback and guidance to TLDS staff.

6(c)(i) System Architecture Timeline

1. Security features. CBER Project Manager 1 and a data architecture subcontractor will oversee the development, testing, validation, and continuous improvement of necessary infrastructure and software security measures. All efforts will be made to meet and exceed federal and state security requirements. Project Manager 1 will serve as the liaison between the subcontractor and TLDS leadership and will be directly responsible for all products produced by the subcontractor. These security features will be planned and designed during Y1-Q1 and Q2, fully implemented by the subcontractor during Y1-Q3 and Q4, and continuously maintained and evaluated beginning in Y2-Q1.
2. TLDS functional requirements. All TLDS directors and managers will plan forward-looking functional requirements and capabilities of the TLDS. Leadership will identify the data needs of end-users (the public, DOE, participating agencies, and researchers) and plan how the TLDS will meet those needs. These functional requirements will be planned during Y1-Q1 and Q2.
3. Capital products. Co-Project Directors and Project Manager 1 will be responsible for acquiring, evaluating and maintaining all capital products. Initial capital products for secure database locations at DOE and CBER will be in place during Year 1, with additional capital products for the partner agencies acquired during Years 2 and 3. The evaluation and maintenance of all capital products may begin in Y2-Q1, after they are in place and fully operational at CBER and DOE.
4. Data taxonomy, structure, and documentation features. Project Manager 2 will be directly responsible for these features, with consultation and assistance provided by the architectural subcontractor. Project Manager 2 will identify best practices and standards during Y1-Q1 and Q2, and implementation and documentation may begin at Y1-Q3.
5. Data import design features. Data import functionality will be designed by the subcontractor; responsibility will lie with Project Managers 1 and 2. These features will be designed during Y1-Q3—Y1-Q4, with testing and evaluation occurring during Y2-Q1—Y2-Q2.
6. System evaluation products. System evaluation will be a collaborative effort of the Co-Project Directors, Project Managers, and data architecture subcontractor. These personnel

will ensure that the system satisfies the needs of all end users. Data warehouse personnel will develop a web-based feedback application for bug reports and other complaints during Year 2, commensurate with the integration and use of Phase 1 and 2 data. Project Manager 1 will regularly evaluate the TLDS architecture and security system, beginning in Year 2 and ongoing. The DOE Co-Project Director will be responsible for coordinating external evaluations, in accordance with state and federal regulations.

7. Internal audit features. Project Manager 1, in collaboration with the data architecture subcontractor and data warehouse personnel, will be responsible for designing data validation and audit processes to seek, report, and correct errors in the data. Audits will be developed beginning in Y1-Q3, simultaneously with the unique student identification system. Additional validation processes will be incorporated on an ongoing basis as the scope of the TLDS expands.
8. Incoming data integrity features. This subtask requires collaboration between CBER, DOE, Project Manager 2, and the Governance Manager. TLDS managers will determine the most efficient pathways for high-quality data delivery, and recommend adaptations to source agencies' information technology systems. Adaptations to DOE Oracle systems will be an important first step, and is expected to commence in year 1, quarter 1. Features to improve incoming data from other sources will be implemented from the beginning of architectural design in Y1-Q3, and will be ongoing.

<u>6(c)(ii) Data Integration Timeline</u>

1. Phase 1: P-20 LDS
   - Unique student identifier and masking features: develop algorithms to match students across Phase 1 data files. Several LDS elements spanning pre-K through the workforce are currently in a common location at the University of Tennessee CBER. Additional P-12 student-level data are maintained by DOE and SAS, Inc. Beginning in Y1-Q3, data warehouse personnel will develop matching algorithms that take advantage of Social Security numbers and other in-service serial numbers identified by the Agency Technical Coordinator. Then, data warehouse personnel and the subcontractor will create a single, global identifier that is not traceable to individuals. This sub-task is coupled closely with

security features. All confidential data with no TLDS purpose outside of matching will be stored in a separate, secure location. We expect this initial identification algorithm will have broad, but not universal coverage. The Master Person Index (described below) will allow for universal coverage of the unique student identification system.

- Integrate existing longitudinal elements from DOE, CBER, TVAAS, and NCES to form a partial P-20 LDS. CBER will house the TLDS data warehouse. By Y2-Q1, the secure architecture and student identification systems will be in place. At this time, Project Manager 2 will oversee the integration of all available data and the formation of the TLDS.

2. Phase 2: P-20 LDS Enhancements
   - Develop and implement the Master Person Index (MPI). The DOE Co-Project Director, OIR, and outside vendors will oversee the development of the MPI through the end of Y1. The Architecture Manager will communicate the limitations of Social Security numbers and other in-service student identifiers to the State of Tennessee Office for Information Resources (OIR), beginning in Y1-Q3. Project Manager 2 and OIR will jointly integrate the MPI into the TLDS between Y2-Q1 and Y2-Q2. The MPI will reconcile unmatched Phase 1 data and lay the foundation for the integration of Phases 2 and 3 data. The MPI will be adapted or expanded commensurate with its value added, as determined by the Architecture Manager and Technical Director near the end of Y2.
   - Integrate data from agencies with formal agreements to participate in TLDS. Through the first half of Y2, TLDS leadership, along with the Governance Manager and Steering Committee, will formalize data acquisition and sharing agreements with selected agencies (including the Department of Children's Services, the Department of Health, and other agencies listed in section 6(b)(ii)2). Project Manager 1, with consultation from OIR and the subcontractor, will merge Phase 2 agency data (via MPI) with TLDS by the end of Y2

3. Phase 3: P-20 LDS Enhancements

- Integrate data from agencies with formal agreements to participate in TLDS. TLDS leadership, along with the Governance Manager and Steering Committee, will formalize data acquisition and sharing agreements with identified Phase 3 agencies through the end of Y2. This task will be ongoing as more agencies, organizations, and cross-state collaborators are recruited, and as the data requirements of partner agencies evolve. Project Manager 1, with consultation from OIR the subcontractor, will merge Phase 3 agency data (via MPI) with the TLDS by the end of Y3-Q2.

6(c)(iii) Reporting and Research Timeline

1. Business intelligence (BI) features. All DOE and CBER directors and managers and the Steering Committee will be responsible for planning functional requirements of BI interfaces by the end of Y1-Q3. Existing SAS, Inc. TVAAS interfaces will be expanded to include richer student data from DOE, CBER, and participating agencies. The Governance Manager and CBER Co-Project Director will plan and document business rules for aggregation, access, and sharing, starting in Y2-Q1 and ongoing as additional agencies are recruited to participate. SAS, Inc. will program aggregation and access rules, beginning in Y2-Q1, and ongoing as additional data is integrated. Data warehouse personnel will connect BI layers to the TLDS, beginning with integrated Phase 1 data in Y2-Q1, and then with Phases 2 and 3 data throughout Y3. Project Manager 2 will test and evaluate BI tools throughout Y2 and Y3.
2. Web-based portals. Projects Managers 1 and 2 and SAS, Inc. will oversee development, testing, and validation of web-based portals for TLDS data access. The degree of allowed disaggregation will be determined by user class (public, school, LEA, DOE, or qualified employees of the partner agencies), security clearance, and user needs. Portal interfaces will be tested and validated before launch. Dashboards for schools, LEA administrators, and DOE personnel will be launched following successful integration of Phase 1 data. At that time, TLDS managers will develop an early warning algorithm to identify at-risk students using multiple dimensions of student information (attendance, achievement, disciplinary actions, and so forth). TVAAS/TLDS dashboards will be used to notify school leaders of at-risk students. Additional dashboards for qualified agency personnel will be launched following the incorporation of Phase 2 and 3 data. SAS, Inc. will host webinars to introduce qualified

personnel to the new TVAAS/TLDS dashboards and early warning notifications. The first wave of webinars will target school, LEA, and DOE portal users, and the second wave will target agency portal users.

3. Research support features. TLDS leadership and managers will determine functional requirements of a research support layer connecting TLDS data to researchers and policy analysts in Y1-Q3. This class of end-user requires a fine level of detail for data analysis; accordingly, TLDS leadership, Governance Manager, and Steering Committee will plan and document research access procedures and research-specific security measures by the end of Y2-Q2. Research support layers (i.e., statistical packages and supporting features) will be selected in Y2-Q1 and adapted to support access and security protocols.
4. Research reports and policy analysis. By Y2-Q3, Phase 1 and some Phase 2 data will be integrated into the TLDS, the MPI will be operational, and the TLDS will be a valuable resource for research. At this time, the CBER Co-Project Director and Steering Committee will begin evaluating projects requiring access to a finer or broader level of detail afforded by web-based portals. Approved projects will be monitored, and final reports will be collected in a restricted-access library of TLDS research.

6(d) Project Management and Governance Plan

Project location: The project is located within TDOE with Co-Project Directors (CPDs) and support staff located in TDOE and at CBER, a trusted third party already in an established relationship with TDOE, THEC and several other state agencies. This is a collaborative project that goes beyond typically delineated boundaries. DOE's existing LDS Governance, described below and depicted in *8. Appendix A5*, and CBER are responsible for approval and oversight of project activities.

Governance Structure: A Steering Committee chaired by the Commissioner of DOE, empowered to set policy for all interagency components of TLDS, will be composed of the Commissioner or her designee from each partner agency, TDOE and CBER Co-Project Directors, and Finance and Administration, *8. Appendix A5*. The Steering Committee will meet frequently during the development stage of TLDS, then approximately twice yearly once the

database has been established. The Steering Committee will coordinate with other interagency policy boards, including the one currently being established for e-health, *8. Appendix A6*.

A Work Group will be appointed composed of one policy and one IT representative from each member of the Steering Committee. The Work Group will be charged with implementing policy set by the Steering Committee, be responsible for evolution of the database as available data and needs change over time, and make decisions within policy set by the Steering Committee on specific access to the database and on what data can be made available to which users. The Work Group will organize functional work areas focused on specific issues such as security protocols, how and when data are to be updated, and performance standards for the participants, among others.

The current TDOE Data Management Committee will be retained as key informants in the Governance Structure as they are currently organized. Areas represented on Data Management Committee are Office of Federal Programs; Field Service Centers/State Schools; CCD, Non-Fiscal, Curriculum and Instruction; Financials; Career and Technical Development; Office of Assessment; Professional Development; Special Education; Department of Early Childhood; English Language Learners; Free and Reduced Lunch; Highly Qualified; Graduation Rate; Discipline/Dropout; Annual Yearly Progress/Report Card; and Safe and Drug Free Schools.

The CPDs will be responsible for the project's operation during the period of the grant, sustained in DOE by the Department's Chief Analytic Officer and at CBER through integration of the databases developed during the grant into ongoing operations of the Center.

Project Management Controls: DOE and CBER CPDs will meet frequently to assure these functions occur timely:

- DOE's CPD is responsible for enhancing the P-12 to its full potential and expanding TLDS to a complete P-16/P-20 through the existing Governance Structure, *8. Appendix A5*, supported by a Database Administrator responsible for LDS database transactions and reports and a research analyst (Yr 1, Q1, Q2 and beyond). Additionally, in

collaboration with a policy analyst in the Governor's Office of Children's Care Coordination (GOCCC), who serves as Governance Manager for the project, the DOE CPD is responsible for initiating multi-departmental data acquisition agreements (Yr 1, Q3, Q4). Staff of the GOCCC is responsible for developing and coordinating the Steering Committee (Yr 1, Q1 and beyond) and developing and monitoring formal Memoranda of Understandings among the departments, CBER and DOE.

- CBER's CPD is responsible for the architecture for the project to be developed by a qualified subcontractor, which will include acquisition of the hardware, development of the software and filling of the database with data from the many partner agencies.

CBER will have two Project Managers (PMs) who will have day-to-day responsibility in coordination with TDOE for different aspects of database development. One PM in CBER will take responsibility for development of software and acquisition of hardware (Yr 1, Q1, Q2) and testing and evaluation (Yr 1, Q3, Q4). PM1 will work closely with the qualified subcontractor who designs and builds the database to ensure the architecture is consistent with Tennessee's needs, allows highly functional and efficient access to appropriate data and analysis and can be efficiently maintained and updated once it has been developed. PM1 will also work closely with partner agencies to ensure they have appropriate hardware and software to upload data seamlessly into TLDS and to download data and analysis in an appropriate format to facilitate usefulness for partner agency operations and analyses. PM1, together with her counterpart in TDOE, will serve as the primary advisors to partner agencies on solving hardware and software problems. This person will serve as the Architecture Manager (Yr 1 and beyond).

The second Project Manager in CBER will take responsibility in cooperation with TDOE for data linkages with partner agencies. PM2 will work with partner agencies, and particularly with the GOCCC Governance Manager in obtaining partner agency agreements on what data are to be included in TLDS and who has access to the data. PM2 will represent CBER in the Work Group to ensure smooth, unimpeded communications on implementation of the governance plan. Further, PM2 together with his or her counterpart will be accountable for developing clear understanding of the data being placed into TLDS, data cleansing and internal audit for all

partner agency data, and a data dictionary that provides a consistent set of definitions across data retrieved from partner agencies so the resulting product can be reliably and consistently matched across underlying data sets (Yr 1, Q3, Q4 and beyond).

A set of academic advisors will work regularly with the core TDOE and CBER project staffs to ensure the data and architecture are designed most usefully for implementation in partner agencies' operations and for analysis of public policy and education outcomes and methods. Further, the academic advisors together with TDOE will develop the initial public reporting on education in Tennessee and on how education interacts and interfaces with other key public policy investments including in health, correction, higher education, and children's services. Academic advisors will come from multiple backgrounds including economics, geography, and accounting.

Adherence to project timelines and budgets will be reported monthly to the DOE Commissioner and Executive Management Team and to CBER's leadership.

Project Partners: The other partner agencies in the project are SAS, OIR, the Departments of Children's Services, Health, Human Services, Mental Health and Developmental Disabilities, Correction, Labor & Workforce Development, THEC, TCCY and TennCare Bureau. Initial Project Charters, included in *11. Appendix D*, articulate commitments for implementation by the partner agencies. Memoranda of Understandings will be formalized during the period of the grant.

Input of teachers and other educators will be sustained through input from and feedback to the District Technology Advisory Committee, extant. In addition, the District Technology Advisory Committee will include representatives of model Teacher/Student IT projects planned or underway in Memphis, Nashville, Knox County and Greeneville Tennessee.

Training and Technical Assistance: Ongoing and sustained training across education sectors is vital to TLDS. If we do not examine and analyze our data we will have wasted millions of

dollars on a technical infrastructure and be unable to determine which school courses prepare students for higher education. The overall scope of training will attend to consistent coordinated training for LEAs, Administrators, Counselors, interagency personnel and other child caring personnel who hold appropriate security identification for student data access. These trainings will address needs anticipated over the next five years and beyond, as the State of Tennessee develops a broad capacity to respond to students at risk of, in, or emerging from crises.

Types of Training: The types of training that will be delivered include: Conference trainings at the Annual Superintendents conference, the spring and fall attendance conference, the Annual Teachers Annual Tennessee Educational Technology Conference, web portal training and webinars training.

1. FERPA Rules and Regulations;
2. The Data Elements of the TLDS;
3. Data use for best practices;
4. Data use for student improvement and analyses;
5. Data use for effective teaching; and
6. Data use for curriculum changes/modifications

Web Portal training will be available for teachers, administrators, counselors and school board members and legislators who hold appropriate security permissions. The intent is to reach multiple stakeholders in the education language that they understand. This site will include a data sharing area for dialogue. It will include regular case studies of best practice and lessons learned. It will also have secure portals for authorized users to access the state's longitudinal data system. The web portal will support on demand personalized training which will be used for Professional Development.

Letters of support from all partners and initial Project Charters, as appropriate, are included in *11. Appendix D.*

(e) Staffing

Staff support for project and Governance structure for the project is comprised of
(1) the DOE Co-Project Director, DOE's Chief Analytic Officer, responsible for enhancing P-12 and expanding to P-20; 2 Data Base Administrators responsible for, but not limited to, the design, implementation, maintenance and repair of DOE's student longitudinal database, to include installation of new hardware/software, security administration, data analysis, database design, data modeling, optimization and performance analysis and tuning; 2 research analysts responsible for providing expert analysis and analytical skills to assess educational performance from teacher to student, student to school, school to district, district to district and LEA to LEA for Tennessee students; and 1 full time administrative support staff responsible for maintaining documentation about the project, timely communications among the partners, and related organizational support;
(2) the CBER Co-Project Director responsible for managing development and operation of TLDS in collaboration with TDOE; Project Manager 1 responsible, in conjunction with a qualified subcontractor, for development of software and acquisition of hardware and for hardware and software problem solving with project partners; Project Manager 2 responsible for data linkages with partner agencies, protocols for data, cleansing, and internal audit, development of data dictionary, and representing CBER in the Work Group; academic advisory staff (one full time equivalent per year), and one support staff; and
(3) one GOCCC policy analyst, the Governance Manager, responsible for multi-departmental project collaboration.

DATA QUALITY CAMPAIGN
Using Data To Improve Student Achievement
www.DataQualityCampaign.org

# TENNESSEE

## DQC 2009 Annual Survey Update and State Progress Report

The Data Quality Campaign (DQC) was launched in 2005 to help states develop robust longitudinal data systems that can provide policymakers and educators with information to help adjust policies and practices to improve student achievement. The DQC has identified 10 Essential Elements of a robust data system (see below) and 10 Actions all states must take to ensure effective use of data (see reverse side).

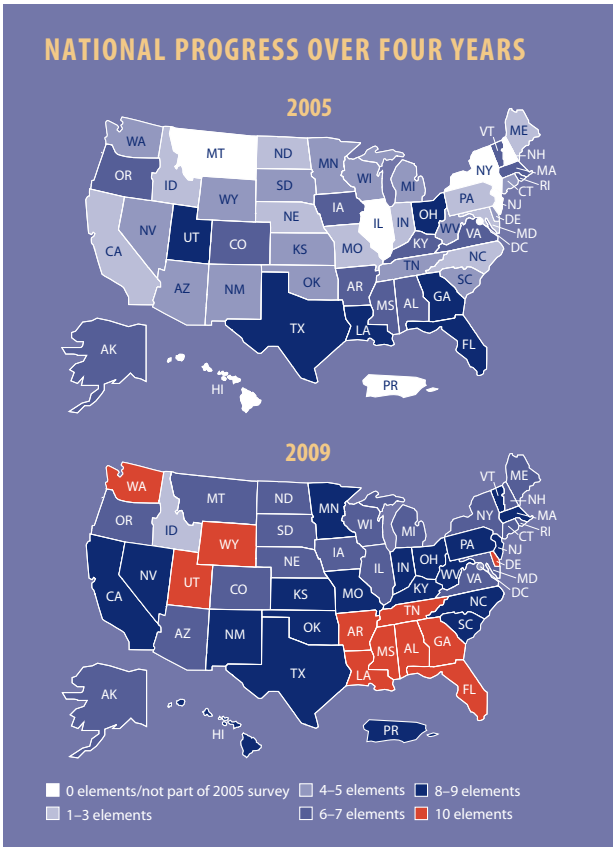
## State Status on the 10 Essential Elements

| Element | | State Status |
|---|---|---|
| 1. | A unique student identifier | ✓ |
| 2. | Student-level enrollment, demographic and program participation information | ✓ |
| 3. | The ability to match individual students' test records from year to year to measure academic growth | ✓ |
| 4. | Information on untested students | ✓ |
| 5. | A teacher identifier system with the ability to match teachers to students | ✓ |
| 6. | Student-level transcript information, including information on courses completed and grades earned | ✓ |
| 7. | Student-level college readiness test scores | ✓ |
| 8. | Student-level graduation and dropout data | ✓ |
| 9. | The ability to match student records between the P–12 and postsecondary systems | ✓ |
| 10. | A state data audit system assessing data quality, validity and reliability | ✓ |

## Key Policy Questions

States that have all 10 Essential Elements have the capacity to answer key policy questions. Based on survey responses, Tennessee has the ability to answer the following key policy questions:

- Which schools produce the strongest academic growth for their students? *(Elements 1, 2, 3, 4)* — **YES**
- Which middle school achievement levels indicate that a student is on track to succeed in rigorous courses in high school? *(Elements 1, 3, 6, 7)* — **YES**
- Does the state have the necessary elements to calculate a longitudinal graduation rate, according to the calculation agreed to in the 2005 National Governors Association compact? *(Elements 1, 2, 8, 10)* — **YES**
- What high school performance indicators (e.g., enrollment in rigorous courses or performance on state tests) are the best predictors of students' success in college or the workplace? *(Elements 1, 3, 6, 7, 8, 9)* — **YES**
- What percentage of high school graduates require remedial education in college? *(Elements 1, 8, 9)* — **YES**
- Which teacher preparation programs produce graduates whose students have the strongest academic growth? *(Elements 1, 3, 4, 5)* — **YES**




**State Contact**
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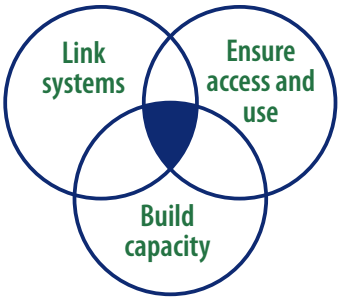
For additional information on your state's results, go to www.DataQualityCampaign.org.

## Looking Ahead: States Must Take Actions To Promote the *Use* of Data

Creating state longitudinal data systems able to provide answers to key questions about performance is a vital first step. However, states also must have policies and practices in place so that stakeholders throughout the education system can access, understand and use the information effectively. Specifically, states should focus on three overarching imperatives for changing the culture around data use to maximize their investment in longitudinal data systems:

- **Expand** the ability of state longitudinal data systems to link across the P–20/workforce pipeline;
- **Ensure** that data can be accessed, analyzed and used by multiple stakeholders including educators, parents and researchers; and
- **Build** the capacity of all stakeholders to use longitudinal data.




In January 2010, the DQC will issue its first report on individual states' progress on the 10 State Actions to ensure the effective use of longitudinal data. The results will provide greater detail on how states are changing policies and practice to promote links across systems, ensure appropriate access to new data and analysis, and strengthen stakeholder capacity to use the information.

### 10 STATE ACTIONS TO ENSURE EFFECTIVE DATA USE

To ensure key stakeholders have access to and are using data effectively, states must:

1. Link state K–12 data systems with early learning, postsecondary education, workforce, social services and other critical state agency data systems.
2. Create stable, sustained support for robust state longitudinal data systems.
3. Develop governance structures to guide data collection, sharing and use.
4. Build state data repositories (e.g., data warehouses) that integrate student, staff, financial and facility data.
5. Implement systems to provide all stakeholders timely access to the information they need while protecting student privacy.
6. Create progress reports with individual student data that provide information educators, parents and students can use to improve student performance.
7. Create reports that include longitudinal statistics on school systems and groups of students to guide school-, district- and state-level improvement efforts.
8. Develop a purposeful research agenda and collaborate with universities, researchers and intermediary groups to explore the data for useful information.
9. Implement policies and promote practices, including professional development and credentialing, to ensure that educators know how to access, analyze and use data appropriately.
10. Promote strategies to raise awareness of available data and ensure that all key stakeholders, including state policymakers, know how to access, analyze and use the information.

*The DQC will publish results on the 10 State Actions in January 2010. For additional information, visit www.DataQualityCampaign.org/resources/384.*

**For more information about the DQC survey, visit www.DataQualityCampaign.org or contact Bi Vuong at Bi@DataQualityCampaign.org.**

**360 Student View SAS® Recommendations**

The following recommendations provide LEAS a student-specific heads up about test performance in the current year. Experiences in MNPS, MCS and Hamilton County as well as those in other states, previous conversations with a variety of state agency staff, the Department's application for LDS funding, and the intent to deliver TVAAS teacher reports via the TVAAS restricted site were considered in the preparation of this proposal.

A successful completion requires that the Department create a file of students that indicates the LEA and school (name and number) where they are presently enrolled/attending. If this project is to proceed on schedule, SAS should receive the file as soon as possible. This information enables the automated reports that are the drilldown to students summarized in the academic dashboards.

By early January 2010, SAS will provide to the Department files for LEAs that indicate the teachers receiving reports in 2009. These files will include the teachers' first and last names, their assigned schools (2009), grades, subjects, and their state identifier as reported on the 2009 TVAAS teacher reports. LEAs must update these files by including any new teachers assigned in 2010, removing any teachers not teaching in 2010, and adding email addresses for individual teachers. The updated files from LEAs will become 1) the basis of assigning school user accounts for teachers as soon as possible and 2) for delivering their teacher reports in fall of 2010.

The PK-12 professional development activities to support this project are a combination of face-to-face informational and train the trainer meetings (urban areas) as well as virtual iPod and real time WebEx sessions. The *i*Pod sessions will be publicly available from the Departments Electronic Learning Center as well as through the TVAAS restricted website. SAS will develop the supporting materials for all sessions, design and deliver the recorded the *i*Pod sessions and also deliver the WebEx sessions. SAS will imbed in the restricted site application a system for counting attendance for those who desire to accumulate professional development hours through the offerings of this project. Additional support for emailed questions will be handled through *Contact Us* on the TVAAS restricted website.

The professional development will be available as a pre-service offering to any university entering into a Demonstration Site Agreement with SAS. This will ensure the consistency of the content delivery. SAS will provide demonstration sites of simulated TVAAS districts/schools/student & teacher reporting for this purpose at no cost to the universities similar to those used in the PK-12 activities. SAS has piloted use of these sites in a limited format with the Tennessee Education Association, University of Tennessee, Chattanooga and David Lipscomb University.

Presently, teachers sometimes lack the support within their schools to understand the educational implications of their teacher reports, the student projections or the school results. These sessions will create the resource base for using the TVAAS results diagnostically. The activities for teachers, instructional coaches and principals will emphasize differentiated instruction, appropriate use of academic interventions and setting effectiveness expectations for personal professional performance.

As they become available on the website, environmental indicators will be added to the sessions and activities to demonstrate appropriate uses will be included. It would be advantageous to the ultimate success of this project if the inter-governmental agency agreements and information sharing could be piloted in MNPS in the

next year. It would be good to start with a small number of indicators and add to that group as research/interest indicates they are necessary.

It would be advantageous to the ultimate success of this 360 Degree Student View project if some inter-governmental agency agreements and information sharing could be piloted in MNPS in the next year. It would be good to start with a small number of indicators and add to that group as research/interest indicates they are necessary.

**Estimated costs associated with SAS delivery of this project: $510,000**

Budget detail (also included in budget appendix)

| | |
|---|---|
| Develop Electronic Learning iPod Sessions, support materials for participants | 50,000 |
| Develop professional development tracking functionality | 30,000 |
| Facilitating, developing materials for regional PK-12, Higher Education, and Urban Center Sessions (50 days at $2,000 per day) | 100,000 |
| Real Time WebEx Sessions (Includes teachers, principals, instructional coaches, guidance counselors, Special education, ELL & title 1 teachers and curriculum specialists) | 270,000 |
| Technical support for creating teacher, principal and guidance counselor accounts | 60,000 |

Timeline

| | |
|---|---|
| 1/30/ 2010 | All LEAs have access to the dashboards reporting on students at their enrolled school |
| 2/28/2010 | First regional and higher education information meetings occur. |
| 3/30/2010 | All supporting materials and *i*Pod sessions for teachers completed. |
| 4/30/2010 | Teacher accounts created for LEAs with capacity to deliver appropriate access files. |
| | Second regional and higher education meetings occur |
| 3/1-8/30/2010 | Remaining teacher accounts created. |
| | Users complete appropriate professional development sessions. |
| 8/30/2010 | Professional Development Tracking Functionality operational. |

**Estimated SAS contribution for consulting, analyses, application development, printing and travel expenses for piloting in MNPS & MCS: $120,000**

**Table 1: Timeline for Implementing New Approaches to Accessing and Using State Data**

**Reform Plan Criteria C(2) and C(3)**

**Goal: To ensure that data from the state's statewide longitudinal data system are accessible to, and used to inform and engage, as appropriate, key stakeholders, and to ensure that data is used to improve instruction.**

**For all of these activities, the responsible party will be the Tennessee Department of Education (TDOE), in coordination with the SAS Institute (existing state contractor), additional contracted training partner and our statewide research & evaluation team.**

SAS and an external organization will collaborate to deliver statewide supports in the following areas:

- Building the capacity of teachers and school leaders in the area of balanced assessment
- Enhancing educators' capacity to maximize the robust value-added information at their disposal
- Ensuring quality, transparency, and utility in data systems
- Providing research and innovation expertise in identifying the impact of specific interventions and determine potential for replication statewide
- Supporting districts as they research, develop, implement, and enhance systems of differentiated compensation
- Supporting educators in the Coalition of Large School Systems (CLASS) districts that comprise 34% of the students in our state
- Supporting a select number of schools in the Rural School Improvement Collaborative
- Supporting the Tennessee Department of Education in developing the long-term capacity to deliver the innovative outcomes outlined in the Race to the Top proposal

| Year 1<br>2010-11 | Year 2<br>2011-12 | Year 3<br>2012-13 | Year 4<br>2013-14 |
|---|---|---|---|
| Equip every teacher with access to value-added data specific to his/her classroom and/or school via the new data dashboard (including account access and passwords). | Monitor and report access and usage of the system on a school and district level. | Monitor and report access and usage of the system on a school and district level. | Monitor and report access and usage of the system on a school and district level. |

| | | | |
|---|---|---|---|
| TDOE will train every teacher and principal in use of value-added data through a partnership with an external organization to focus on using value-added for differentiated instruction, curriculum choices, and more; external organization to train districts in the use of value-added assessment for compensation and direct links to teachers' and principals' evaluation as well. | LEAs conduct annual reviews of their teachers and principals and publicly report data (Appendix D-2-2). | LEAs conduct annual reviews of its teachers and principals and publicly report data (Appendix D-2-2). | LEAs conduct annual reviews of its teachers and principals and publicly report data (Appendix D-2-2). |
| TDOE will contract for focused support of and consultation to the TDOE staff (regional and in main office) and CLASS to build strong capacity to do this work. | Work with TDOE and CLASS will continue; focused support of and consultation to the Achievement School District and Rural Consortium in this work. | Focused work will continue; ongoing consultation to other districts as needed. | Focused work will continue; ongoing consultation to other districts as needed. |
| All LEAs have access to the dashboards reporting on students at their enrolled school to affirm the accuracy of the data. | All LEAs have access to the dashboards reporting on students at their enrolled school to affirm the accuracy of the data. | All LEAs have access to the dashboards reporting on students at their enrolled school to affirm the accuracy of the data. | All LEAs have access to the dashboards reporting on students at their enrolled school to affirm the accuracy of the data. |
| Electronic Learning iPod™ and live interactive WebEx™ training sessions created and | Online access to iPod™ & WebEx™ training developed in year 1. Face-to-face training | Online access to iPod™ & WebEx™ training developed in year 1. Face-to-face training | Online access to iPod™ & WebEx™ training developed in year 1. Face-to-face training |

| | | | |
|---|---|---|---|
| available. Comprehensive training program launched. | sessions captured and available online through the Electronic Learning Center for ongoing access and reference. Training statewide continues. | sessions captured and available online through the Electronic Learning Center for ongoing access and reference. Training statewide continues. | sessions captured and available online through the Electronic Learning Center for ongoing access and reference. Training statewide continues. |
| Professional Development Tracking Functionality operational. | Professional Development Tracking Functionality ongoing. | Professional Development Tracking Functionality ongoing. | Professional Development Tracking Functionality ongoing. |
| Establish Tennessee's Consortium on Research, Evaluation, and Development (TN CRED). Outline series of research projects and identify specific areas of expertise that need to be represented. Identify external resource opportunities for funding research and collaborative national efforts for participation. | TN CRED continues work on research and evaluation agenda. | TN CRED continues work on research and evaluation agenda. | TN CRED continues work on research and evaluation agenda. |
| Benchmark data from the longitudinal data system, TVAAS, and local instructional improvement systems to be available to researchers. | Ongoing data from the longitudinal data system, TVAAS, and local instructional improvement systems to be available to researchers. | Ongoing data from the longitudinal data system, TVAAS, and local instructional improvement systems to be available to researchers. | Ongoing data from the longitudinal data system, TVAAS, and local instructional improvement systems to be available to researchers. |
| | TDOE teacher and principal evaluation system will be linked to the instructional data system, allowing for alignment and decision-making in the crafting of individualized supports for improving practice. | Enhanced usage of the system on an annual basis. | Enhanced usage of the system on an annual basis. |

| | | | |
|---|---|---|---|
| Teacher and principal preparation programs prepare to include partner developed data training in their coursework (Appendix D-4-1 as well). | Teacher and principal preparation programs to begin including data training in their coursework (Appendix D-4-1 as well). | Teacher and principal preparation programs include data training in their coursework (Appendix D-4-1 as well). | Teacher and principal preparation programs include data training in their coursework (Appendix D-4-1 as well). |

## Tennessee's Consortium on Research, Evaluation, and Development

### 1. Introduction

Tennessee will use the unprecedented opportunity of Race to the Top to transform the educational experience for children in the state. A comprehensive reform agenda leverages the belief that rigorous standards and assessments, great teaching and great leadership, and high-quality data systems are among the most powerful tools in realizing the academic achievement necessary to prepare all TN students for success in post-secondary education, careers, and citizenship. Tennessee is proposing the formation of a consortium of nationally-prominent contributors and institutions to coordinate and engage in research, evaluation, and development activities to ensure high-quality reform efforts are implemented over time and that lessons learned are accessible to others embarking on such ambitious and ever-important initiatives.

The consortium will put in place a series of investigator led initiatives to assess the success of Tennessee's innovative reform efforts and identify areas of greatest opportunity and challenge. In doing so, it will provide the intellectual and organizational capacity to inform policies, programs, and practices with research-based evidence; provisions that the state currently could not provide on its own. Furthermore, the consortium fully intends to share findings with other Race to the Top grantees so they too can learn from Tennessee's reform efforts and experiences.

The subsequent overview is delineated into 5 subsections, including the

- Goals of the consortium.
- Core leadership team and operating principles of consortium.
- Research, evaluation, and development coordinated by the consortium.
- Quality insurance and control.

### 2. Goals of the Consortium

Four goals serve as a guide for the principle activities of the consortium and to help inform Tennessee's comprehensive reform agenda.

- To support implementation of state and local reform efforts, and ensure all proposed criterion and projected goals are met.

- To put into action high-quality research, evaluation, and development activities aimed at informing how best to reform education and educate children and that capitalize on new scientific opportunities arising from reform investments and accomplishments.

- To synthesize and promote the exchange of high-quality empirical evidence on state-of-the-art initiatives and recent advances in the four principle elements of state reform plans for Race to the Top.

- To stimulate meaningful collaboration among educational researchers, practitioners, and policymakers and encourage these stakeholders to take advantage of the most promising educational reform directions and strategies.

In the first two- to four-months of the project, members of the consortium will draft a multidimensional research, evaluation, and development agenda containing an interrelated set of strategies and targets for achieving Tennessee's comprehensive reform agenda. The planning process will be informed by input from key stakeholders, organizational partners, and external experts, through meetings convened by the consortium with stakeholders in Tennessee, other Race to the Top grantees, and through interactions with USDOE staff and leadership. Importantly, the strategic direction and activities will be dynamic so that the consortium can respond to opportunities and events as they unfold in real-time.

**3. Core Leadership Team and Operating Principles**

Professor Matthew Springer (Vanderbilt University; National Center on Performance Incentives) will lead the core leadership team with support from a full-time deputy director. The core leadership team will be installed to provide oversight and direction of all research, evaluation, and development activities associated with Tennessee's reform agenda. Members of the leadership team will be comprised of prominent researchers, policymakers, and practitioners from across the state of TN as well as contributing experts from across the United States. A preliminary list of the core leadership team members, the role each member will play, and their substantive areas of expertise are displayed in Table 1.

The core leadership team has excellent experience in so-called "risk management elements" endemic to the research and development management process. This includes understanding how to anticipate and prepare for problems, such as possible loss of internal research personnel, field staff, or other assets required to deliver timely and high-quality outcomes. For example, study and project plans will be articulated through detailed work breakdown structures. These will be updated regularly and familiar to all staff associated with the work. In the event that staffs become unavailable for short or even long periods of time due to unforeseen circumstances, these detailed work plans will allow for other team members to step in and take up the work without loss of time or quality. The work plans also will allow for a "dashboard" check of key study or project components so that the core leadership team knows at any time status of the work as regards quality, timelines and budgets.

The core leadership team will also be organized as a highly interactive, collegial system that nevertheless maintains the clear lines of authority and responsibility necessary to insure quality, accountability, direction, and leadership. Recognizing activities of the consortium will be shaped in large part by Tennessee's reform agenda, which is comprised of an interrelated set of innovative activities around four priority areas, the leadership team will engage in interactive lines of work through the consortium, not as independent and separate lines of work. Select activities include:

- Identify and support research, evaluation, and development activities associated with Tennessee's reform agenda.

- Coordinate data and access required to carry out these activities, and regularly verify adherence to applicable laws, rules, regulations, and standards governing human subjects.

- Define the general parameters, cost, and timeline for each activity along with relevant experts and organizations to carryout work.

- Institute a formal review process to guarantee quality assurance and control of all consortium related activities and project deliverables.

- Develop and administer a comprehensive battery of data collection initiatives at regular intervals that not only assesses but also informs the implementation and impact of various reform efforts in both the short- and long-term.

- Monitor progress toward successfully meeting project goals.

- Devise a multi-pronged communications strategy for disseminating high-quality information to key stakeholders about how best to reform education and educate children in Tennessee.

**4. Research, Evaluation, and Development Coordinated by Consortium**

Applying scientific methods or other forms of disciplined inquiry are critical in the current context of ambitious and ever-important education reform initiatives. Such inquiry, led by the consortium will include testing hypotheses, building theories, fine tuning elements of an intervention, and assessing program efficacy. The consortium will inform Tennessee's reform efforts with both formative and summative evaluations, though the majority of its work, particularly during the first few years of the grant period, will be formative in nature.

The strength of formative evaluation is its ability to provide ongoing feedback about the process and early outcomes of an initiative or set of initiatives, such as those stemming from Tennessee's reform agenda. In fact, it is critical to ensure quality implementation of reform

activities and to allow both practitioners and policymakers to learn from challenges that arise. A formative evaluation promotes continuous quality improvement of a program or policy innovation rather than solely examining the outcomes of an initiative after it has been completed (i.e., summative evaluation).

As noted earlier, the research, evaluation, and development activities of the consortium are structured around the four priorities identified in the Race to the Top guidelines, which are:

- Rigorous standards and high-quality assessments.
- Attracting and keeping great teachers and great leaders.
- Data systems that inform decisions and improve instruction.
- Innovation and effective approaches to turn-around chronically low-performing schools.

Although the organizational structure and strategic direction of the consortium aims to promote an integrated and coherent scope of activities across the four priorities, the subsequent discussion is limited to a few examples of the type of work the consortium plans to conduct within each of these dimensions due to space constraints. A fifth subsection addresses the rich management information systems available to the consortium.

*5.a. Rigorous standards and high-quality assessments*

It is clear that America needs more rigorous academic standards to compete internationally. Tennessee must make college and career readiness the standard for all students. With the advent of national standards and assessments soon to follow, monitoring progress toward new and higher standards will be essential.

From a development perspective, the consortium intends to fully leverage Tennessee's uniquely rich administrative data systems to produce innovative, easily understood reports and communication tools that can be communicated to all key stakeholders. These stakeholders must have access to these information sources so that they can better understand the degree to which students are progressing toward these higher standards (while there is time to make changes) and what the implications are for not reaching (generally speaking, a life with very limited opportunities).

Members of consortium, including Drs. June Rivers and William Sanders, anticipate convening a group of experts in the field to develop "value-added" measures for areas that cannot currently be assessed using a standardized assessment instrument. How can student growth be assessed in art, music, physical education, foreign language, K-2, career technical, etc. in fair and repeatable ways? Recognizing that less than one-third of public school teachers work in a tested grade and subject, it is critical high-quality assessments are developed to assess, develop, and recognize the performance of the other 70 percent of the teaching workforce.

*5.b. Attracting and keeping great teachers and great leaders*

Tennessee needs to focus on a multidimensional approach to the recruitment and retention of great teachers and great leaders, while also building the capacity of existing Tennessee educators. The consortium will closely monitor the design, implementation, and impact of the many and varied differentiated compensation plans adopted across the state. It is essential that a broad cadre of Tennessee practitioners understand how to help districts overcome both the adaptive and technical challenges inherent in compensation reform.

In terms of building the capacity of existing Tennessee educators, members of the consortium will identify Tennessee educators that have consistently proven to be among the most highly-effective teachers in the state and then conduct a series of focused case studies of those individuals in an effort to inform best practice. Complementing these efforts will be on-line courses and numerous workshops geared toward enhancing teachers' ability to access and make meaning of Tennessee's value-added data systems. Moreover, members of the consortium also intent to assess the technical and substantive properties of a new, more robust, multidimensional teacher evaluation instrument which incorporates multiple data sources and builds on cutting edge information from the field.

*5.c. Data systems that inform decisions and improve instruction*

Tennessee has one of the nation's premier longitudinal data systems that track students through k-12 public school system. In addition to merging individual data elements into a single comprehensive system, including data on student achievement, student and family demographic information, census information, value-added estimates at multiple levels, revenue and expenditures, etc., the data warehouse will also include college and workforce data elements.

Having a central data repository will enable the consortium and other institutional partners to create innovative tools for superintendents and principals that help them make sense of the patterns and trends in the data, make this information actionable, and identify ways to communicate the information to stakeholders. In essence, Tennessee will have new and innovative, interactive tools that "do the thinking" for practitioners. There job is to "fix the issue" not to spend countless time and energy navigating data system to try to "identify the issue."

*5.d. Innovation and effective approaches to turn-around chronically low-performing schools*

The systems that have produced the current results are uniquely designed to do so. It is clear, however, that school turnaround is possible and in the case of many school systems across the country necessary. The turn-around system must insure the right people are in place, they have access to and the ability to digest the best information, and are engaging in research-based best practices.

*5.e. Availability and use of high-quality education data*

Teacher-level value-added will play a large role in Tennessee's Race to the Top reform efforts. When the general assembly changed the law in early January 2010 the ability for practitioners, researchers, and other stakeholders to access this information was greatly enhanced. For example, our core research team will have access to longitudinal data on estimated effectiveness of middle school teachers from the mid-1990s to present. The Tennessee Longitudinal Data System (TLDS), which is funded by the U.S. Department of Education, is another rich data repository that enables the consortium to address critical issues aligned with Race to the Top priorities.

The consortium will also monitor data quality issues, an aspect of data management that has gone largely unrecognized. Our team has extensive experience with state-of-the-art technology solutions to insure the attribution of teacher effect is accurate and that all data interfaces have a common "brand experience" by continuously gather feedback from the field as to how these interfaces can improve.

The consortium will further benefit from a comprehensive battery of data collection initiatives that will be administered at regular intervals throughout the grant period. This information will help to inform implementation and assess the impact of various reform efforts in both the short- and long-term. In addition to collecting data on specific interventions in the field, we anticipate regularly administering surveys if teacher and principal behavior / attitudes, institutional and organizational dynamics, and student perceptions. This includes information about professional development activities, support and resources, instructional leadership, instructional practices, etc.

**Quality Assurance and Control**

The consortium will implement a quality assurance process that includes an internal and external review of all programmatic efforts before they are approved for implementation and then again before findings are disseminated to the field. All research and development activities and all products and services developed by the consortium under Tennessee's Race to the Top application, including training modules, professional development and technical assistance activities, and all substantive materials intended for broad distribution (*e.g.*, written documents, research, policy or evaluation reports, training manuals, curriculum materials, video and audio programs, or Web-based products and resources) will be subject to an internal review. Internal review criteria include:

- Effectively meeting an identified, high-priority need.
- Demonstrating a sound research and/or evidence base.

- Having a clearly defined purpose and audience, and a feasible design, dissemination and implementation (if applicable) plan.

- Being delivered in a format and presented in a style that is useful to clients.

- Representing the best available knowledge drawn from research and practice.

- Adhering to high standards for useful, ethical, valid, and reliable inquiry, applied research, and evaluation studies.

These same products and services will also be subject to external review. Reviewers will be drawn from various local, state, and national sources, including advisory networks, institutes of higher education, research centers, state education agencies, professional organizations, and regional laboratories. Designs for research studies, as well those for development of substantive services and products, will undergo external review against rigorous criteria aligned with IES standards for high quality. A Technical Working Group (TWG) convened for the purpose of ensuring high standards of rigor in the research, evaluation, and development activities may also part of the quality review process. And, of course, USDOE will play a significant and delineated role in this review process.

**Table 1. Core Leadership Team**

| Name | Role | Areas of Expertise |
|---|---|---|
| Matthew G. Springer<br>*Vanderbilt University; National Center on Performance Incentives; National Center on School Choice* | Chair | Teacher compensation reform; teacher labor markets; teacher effectiveness; school accountability; school choice; school finance. |
| William Sanders<br>*SAS / University of North Carolina* | | Value added data |
| June Rivers<br>*SAS / University of North Carolina* | | Value added data |
| David Wright<br>*Tennessee Higher Education Commission* | | |
| William F. Fox<br>*University of Tennessee; Center for Business and Economic Development* | | |
| Bryan C. Hassel<br>*Public Impact* | | School accountability; school choice; turnaround schools; data management |
| Keel Hunt<br>*The Strategy Group* | | Media relations and public affairs |
| Tony Bagshaw<br>Battelle for Kids | | Dashboards, implementation, training, value-added measurement, high school reform, end of course assessment |
| Melissa Brown<br>*Tennessee Education Association* | | Research and evaluation |
| Susanna Loeb | | |

| | | |
|---|---|---|
| *Stanford University; Center for Education Policy Analysis* | | |
| Steve Elliott<br>Vanderbilt University; Learning Sciences Institute | | Assessment of children's social skills and academic competence, development and validation of testing accommodations and alternate assessments for evaluating the academic performance of students with disabilities and the design and evaluation of tests and assessments of human performance |
| J.R. Lockwood<br>RAND Corporation | | Value-added assessment and quantitative research methods |
| Brian Jacob<br>University of Michigan | | Teacher and principal labor markets, educational evaluation and policy analysis, and quantitative research methods |
| Ellen Goldring<br>Vanderbilt University | | Principal leadership, assessment, school choice. |
| Additional team members will be added as needed. | | |

**Supporting Tennessee Districts, Schools and Teachers in Using Data for Decision Making**

Tennessee will contract with a national not-for-profit organization that provides strategic counsel and innovative solutions for today's complex educational-improvement challenges. An organization with a mission-driven team of education, technology, communications and business professionals specializes in the creation and implementation of value-added analysis, formative assessment, strategies for recognizing and rewarding teaching excellence and performance management initiatives. It should be willing to partner with the state department of education and school districts to deliver personalized solutions designed to improve teaching and learning and maximize opportunities for all students to thrive in college, in their careers and in life.

The organization must have demonstrated experience helping educators build their capacity around school improvement. The partnership approach focuses on working with education organizations to accelerate student performance by focusing their efforts on the "right people, right metrics and right practices." Specifically, the organization's technology solutions, value-added professional development, change management counsel, communications expertise, innovative thinking, balanced assessment capability and ability to provide support for differentiated compensation programs reflect a broad, deep and systemic view of educational reform.

The goal of the work for this organization will be to accomplish the following statewide:

**1. Build the capacity of teachers and school leaders statewide in the area of balanced assessment**

A balanced assessment system must be used to improve student learning, not just prove if students are learning. Broadly, robust value-added analysis provides the large-scale assessment of how the current instructional program and delivery are benefitting student learning. Short-cycle benchmark assessments provide information on how students are mastering the big ideas at specific intervals. But, teachers' ability to formatively use information in real time to constantly differentiate instruction for students creates the greatest impact.

Research repeatedly confirms the significant impact of highly effective formative assessment practices. While teaching is a complex process, formative assessment is an essential tool in a teacher's toolbox. The organization must have developed proven professional development protocols to build teacher and leader capacity related to balanced assessment systems. These systems have been delivered across the country and internationally. Teachers and leaders build their capacity to create balanced assessments systems, with a focus on formative assessment, through face-to-face professional development and online course work combined with other support systems.

**2. Enhance Tennessee educators' capacity to maximize the robust value-added information at their disposal**

Through SAS® TVAAS®, Tennessee has a world-class system of value-added reports available for use in the school improvement process. SAS® has provided Tennessee educators support in the interpretation of their data for years and that capacity built upon and increased. The organization must welcome the opportunity to work with the SAS® TVAAS® staff to provide multi-modal value-added professional development in Tennessee.

**3. Support Tennessee districts as they research, develop, implement and enhance systems of differentiated compensation**

The organization will deliver an educational-improvement and performance-management model, which also includes a differentiated-compensation program.

Implementing differentiated compensation poses adaptive and technical challenges for practitioners. Professional, targeted and systemic communication efforts are required to overcome the adaptive challenges of differentiated compensation that exist in all school cultures. Simply put, "People are down on what they are not up on." Once the adaptive challenges are overcome, extensive technical challenges must be met. Districts must ensure the quality of data inputs, data processes and data outputs. Districts must have technology tools that clearly define eligibility and award models for individuals, as well as inquiry processes to resolve special cases and highlight areas of the compensation model that require improvement.

**4. Ensure quality, transparency and utility in data systems**

Most educational data systems in America are currently inadequate to feed and inform robust, data-driven school improvement efforts—especially in cases where near perfect levels of accuracy are required. These systems were never designed for these purposes. An excellent data system ensures quality at the input, process and output levels. ensures data quality and data transparency at the input level as teachers and principals verify and adjust the data in the system to accurately reflect instructional practices in classrooms.

Tennessee educators also need processes that inform their decision-making. What are the "early warning" data that provide insight into a student's probability of dropping out of high school, and what process ensures this information is accurately vetted, collected and delivered to key decision-makers?

Finally, educators need information distilled and displayed at that output level in forms that are easy to access, understand and make actionable.

**5. Provide research and innovation expertise**

Working with like-minded institutions in Tennessee, the organization will quantitatively identify highly effective teachers and principals. These individuals will be brought together to collaborate and glean important and replicable lessons. Then, the organization will provide a system and tools to replicate those best practices across the state of Tennessee.

Educational systems struggle to "parse out" the impact specific interventions in the field. The organization will work with like-minded entities in Tennessee to design specific interventions and to robustly examine the efficacy of those interventions to determine which should be considered on a statewide level.

**6. Support Tennessee educators in a rural school improvement collaborative(s)**

The organization must have demonstrated success worked with Appalachian districts in Ohio to secure support from union leaders, superintendents and board members to bring together stakeholders and dramatically improve results in these districts. Rural leaders are typically challenged by

responsibilities in a multitude of areas which make focused school improvement efforts challenging. Rural leaders need tools, resources and support for their districts. Those resources are best delivered via a consortium structure that creates an efficient and effective delivery system.

The organization will partner with sponsoring consortium partners to work with rural Tennessee districts to research, design and deliver school improvement efforts that may include:

- Aggressive goals and clear measures of success
- Maximizing the impact of the value-added data available in Tennessee
- Assessment literacy and use of data to inform decisions
- Embedded professional development, coaching and mentoring
- Extensive collaboration within schools, between schools and between districts
- Career ladders and differentiated compensation
- Use of technology to enhance learning opportunities for teachers and leaders
- Development of broad and deep relationships with higher education institutions
- Community engagement – parents, business, elected officials, etc.
- Participation in research
- High school reform
- Independent evaluation of projects

**7. Support Tennessee educators in an urban school improvement collaborative including Nashville, Knoxville, Chattanooga, Shelby County and Memphis**

While urban settings have unique challenges, they offer tremendous opportunity for impact based on sheer size. It is essential to have a highly involved and skilled partner that can collaborate on the essential work of the improvement effort, and is highly connected to, but outside of the traditional bureaucratic processes. The burden on key leaders to "fly the plane" makes designing and implementing a "new and better plane" on their own virtually impossible.

Effective school reform must be comprehensive and focused. In the end, it will only succeed with the right people, monitoring the right metrics, engaging in the right practices. will engage with key leaders to design and deliver a comprehensive and focused effort that may include:

- Maximizing the impact of the value-added data available in Tennessee
- Assessment literacy and use of data to inform decisions
- Embedded professional development, coaching and mentoring
- Extensive collaboration within schools, between schools and between districts
- Career ladders and differentiated compensation
- Use of technology to enhance learning opportunities for teachers and leaders
- Development of broad and deep relationships with higher education institutions
- Community engagement – parents, business, elected officials, etc.
- Participation in research
- High school reform
- Independent evaluation of the project

**8. Support Tennessee in the enhancement of the state's long-term capacity to deliver the innovative outcomes outlined in the Tennessee's *Race to the Top* Grant**

Tennessee has existing educational support structures that have provided quality service to the state. Structures such as the state's university system, community college system and Regional Field Service Centers have provided this support. The goals outlined in Tennessee's *Race to the Top* Grant are innovative and transformative.

The organization will help build this capacity through enhancing existing structures and creating new structures, if necessary, to serve the state's diverse needs. Centers for Excellence will be established with the capacity to support urban and rural improvement consortiums, high school redesign and reform, differentiated compensation, and professional development around the use of value-added and formative assessment at nine locations in Tennessee. The organization will enhance the capacity of existing structures to ensure that these structures can move this work forward at the close of the *Race to the Top* Grant.