Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4 Volume I – Technical Proposal

Prepared by

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4.4.3.2 Claim of Confidentiality

APA claims no information contained in this proposal to be confidential.

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4.4.3.3 Transmittal Letter

April 17, 2014

Maryland State Department of Education
200 West Baltimore Street, mailroom
Baltimore, MD 21201
Attention: June Dwyer

Dear Ms. Dwyer:

I am pleased to submit this letter and proposal for the Study of Adequacy of Funding for Education in the State of Maryland, Request for Proposal (RFP) Solicitation No. R00R4402342.

Augenblick, Palaich and Associates (APA) is the lead organization (Offeror) in this proposal. Incorporated in 1983, Augenblick Palaich and Associates, Inc. (APA) is a privately-owned, Denver-based consulting firm that specializes in providing technical assistance to state-level policy makers on evaluation and P-20 finance issues. APA conducted the financial analysis for the Maryland Thornton Commission in 2000-01.

APA is joined by Picus Odden and Associates, the Maryland Equity Project and other subcontractors to undertake the proposed work. Picus Odden and Associates (POA) is an independent school finance consulting group whose mission is to work with states and school districts to improve the way public resources for education are translated into improved student learning. The Maryland Equity Project (MEP) is an independent, non-partisan research and policy center located in the College of Education at the University of Maryland.

Below is the required information for APA:

- Primary Contact – Mark Fermanich, Project Manager, MLF@apaconsulting.net, 720.227.0101;
- Federal Employer Identification Number - 840922858; and
- eMM number - 00018014.

We have prepared the proposal according to the specifications outlined in the RFP with no exceptions. We accept all State RFP and contract terms and conditions with no exceptions. We acknowledge receipt of all six addenda to the original RFP. We appreciate the opportunity to submit our plan. Thank you in advance for your consideration.

Sincerely,

Robert Palaich, Ph.D.
President
Augenblick, Palaich, and Associates

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.4 Executive Summary

4.4.3.4 Executive Summary

Augenblick, Palaich and Associates, Inc. (APA) is pleased to present this proposal in response to the Maryland Department of Education's Request for Proposal (RFP) for a Study of the Adequacy of Funding for Education in the State of Maryland (Solicitation No. R00R4402342). APA has taken no exceptions to the requirements of this RFP, the Contract, or any other attachments.

To undertake this work, APA has assembled one of the strongest project teams ever to conduct such a comprehensive set of school finance analyses. Our team consists of three major partners – APA, Picus Odden and Associates (POA) and the Maryland Equity Project – who will undertake the bulk of the work described in this proposal. APA will serve in the capacity of lead organization or "offeror" for this proposal and will direct the work should we be selected. We are also subcontracting with a number of nationally recognized experts to lead several of the studies referenced in the RFP (the school size, changing enrollment and Maryland Geographical Cost of Education Index studies) as well as to assist with additional studies. Several of these contractors are Maryland based. The following provides a brief introduction to the three major partners.

Augenblick, Palaich and Associates

APA is a privately-owned, Denver-based consulting firm that specializes in providing technical assistance to state-level policymakers on early childhood to postsecondary finance issues. APA senior staff combined has almost a century of experience working on school finance-related issues with legislators, testifying before legislative bodies, and working with governors, state education agencies, and other education and community leaders. This experience combined with our academic and professional training gives our firm a unique capacity to translate complex data and analyses into information that is useful to policymakers and to work cooperatively to meet the needs of leaders and lawmakers on all sides of the issues. APA conducted the analysis for the Maryland Thornton Commission in 2000-2001.

Picus Odden and Associates

Picus Odden and Associates (POA) is an independent school finance consulting group whose mission is to work with states and school districts to improve the way public resources for education are translated into improved student learning. Led by managing partner Lawrence O. Picus and principal partner Allan Odden, POA works collaboratively with clients to address state specific school funding issues. Drawing on over seventy years

of experience in school finance, Picus Odden and Associates is uniquely qualified to conduct the work described in this proposal.

Maryland Equity Project at the University of Maryland

The Maryland Equity Project (MEP) is an independent, non-partisan research and policy center located in the College of Education at the University of Maryland. MEP seeks to improve education through research and policy analysis that supports an informed policy debate on the quality and distribution of educational opportunities in Maryland, from early childhood to postsecondary education. MEP draws on faculty and staff expertise, as well as the substantial resources of the University of Maryland, to engage state and local policymakers and educators and increase the impact of research on education policy in Maryland.

Together, APA and POA have combined to undertake and complete the vast majority of adequacy studies conducted across the country over the last 25 years. In most of the cases where we have undertaken an adequacy study we have also been asked by the state to conduct an equity study – as is the case in Maryland. Even more telling in terms of the response to this RFP, APA and POA have assisted virtually every state in the country by either reviewing a state's funding formula or building its funding system based on the results of the types of analyses requested in this RFP.

We understand that the work being requested by the State of Maryland is highly technical in nature and requires extensive experience with school finance processes and systems, such as:

- The way state school finance systems operate;
- In-depth knowledge of the components of such systems and the differences in how they work across the states;
- The definition and measurement of school finance equity using generally accepted statistical procedures;
- The ability to use multiple methods for estimating the cost of providing adequate education services so that students can meet state academic performance objectives; and,
- The ability to work with state policymakers to build a school finance formula that best meets the state's needs and then to simulate its impact on all of the state's school districts.

In order to meet the requirements of this RFP we have proposed an ambitious and comprehensive series of studies that we have categorized as:

- Preliminary studies – those studies required to occur early in the study period and which support and feed into the project's main studies such as the adequacy and school size studies;
- Adequacy studies – we propose to apply three different approaches for determining adequacy in Maryland: 1) the evidence-based approach; 2) the successful schools approach; and 3) the professional judgment approach;
- The school size study; and
- Other requested studies – these include the studies of Community Eligibility Provision/alternative proxies for economic disadvantage, state prekindergarten services, finance equity and the definition of local wealth, increasing/declining enrollment, Supplemental Grants, and the Maryland Geographic Cost of Education Index.

A more comprehensive description of each category of studies is presented below.

The Preliminary Studies

These preliminary studies set the foundation for the project. Three studies fall into this category. The first is a review of recent adequacy studies specified in the RFP. Over the past 15 years, an estimated 100 school finance adequacy studies have been conducted for various states, using the four approaches for estimating adequacy – successful schools, professional judgment panels, evidence-based and cost function. Some states seek adequacy recommendations from all four methods, others select a specific method, and some specify at least two methods be used as required in this RFP. We will focus our review on adequacy studies conducted over the past ten years, as these will provide a comprehensive picture of the current adequacy landscape and will reflect the refinements made in their methodology in recent years.

The second preliminary study is a set of case studies of the following four school types: 1) high performing; 2) rapidly improving; 3) closing the achievement gap; and 4) high performing and high student need. Data collected from these schools will inform all aspects of the adequacy study, the school size study and several of the other requested studies. The case studies will be used to guide our selection of schools for the successful schools component of the adequacy study and the cost model used in the evidence-based approach. The detailed programmatic and cost information collected through these case studies will not only inform our cost estimates, but will also provide state policymakers with information about specific effective approaches currently being used by successful Maryland schools.

The last of the preliminary studies is a set of literature reviews that will contribute to the adequacy study, the school size study, the evaluation of prekindergarten services, the

review of the proxy for identifying economically disadvantaged students study, and the study of the impact of increasing and declining enrollments on local school systems. We will use the literature reviews to inform our analyses, provide the latest thinking from relevant research and provide insights on successful approaches used in other states and schools. Our literature review methodology will include a comprehensive search strategy and rigorous evaluation of the quality of the studies.

The Adequacy Study

In the past two decades, states and researchers have developed several approaches to determining a base cost figure designed to reflect either a particular set of services, a particular level of student performance, or both, so that the base cost has a meaning beyond simply reflecting available revenue. These approaches were developed because no valid research yet exists to document a straightforward statistical relationship between how much is spent on education resources and a corresponding level of student performance. In the absence of such a simple relationship, four approaches have emerged for determining a base cost level: (1) the evidence-based approach; (2) the successful schools approach; (3) the professional judgment approach; and (4) the cost function approach. These approaches differ in terms of underlying philosophy, the assumptions that need to be made to apply them, and the data required. The project team proposes to make use of three of these approaches – successful schools, professional judgment and evidence-based – in its study of adequacy in Maryland. The cost function approach, a statistical model similar to traditional production function models, will not be used in this study for Maryland due to the lack of detailed expenditure data at the school level and the small number of school districts in the state. The three approaches we propose to use in for this study are described below.

The Evidenced-based Approach

The evidenced-based approach assumes that information gathered from research exists to define the resource needs of a hypothetical school or school district to assure that it can meet state standards. This approach was used in New Jersey to determine the resource needs of a subset of school districts, commonly referred to as "Abbott" districts. The court identified these districts as requiring special attention and resources. The approach not only determined resource levels, but also specified the programmatic ways such resources should be used. The strength of the approach is that it incorporates the latest research about the way resources should be used to positively impact student achievement. However, there are disadvantages including questions about whether research applies to all demographic situations, the lack of research information about many cost elements schools face and the fact that the approach may not be state specific. In recent years, the approach has made use of local professional judgment panels and case studies of high performing schools to tailor the evidence-based model to specific state contexts.

The Successful Schools Approach

The successful schools approach is based on the simple premise that any district should be able to be as successful at meeting a set of objectives as those districts that actually meet those objectives. This approach also assumes every district should have the same level of funding that has been available to the successful districts along with additional funding provided to meet the cost of serving students with special needs and districts with special circumstances. This approach is mostly used at the district level. However, to meet the needs of Maryland, where there are relatively few school districts, this approach will be applied to the school level.

The Professional Judgment Approach

The professional judgment approach relies on the views of experienced service providers to specify the kinds of resources and the quantities of those resources that would be necessary to achieve a set of identified objectives. This input-based approach was developed in Wyoming to calculate a base cost amount in response to the state Supreme Court's requirement that the school finance system reflect the cost of the "basket of quality educational goods and services" needed to assure that a high school graduate could be admitted to an institution of higher education in the state. The approach uses panels of experts to specify the types of education services needed in order to meet state standards. Once the services have been specified (with a focus on numbers of personnel, regular school programs, extended-day and extended-year programs, numbers of different types of personnel, professional development and technology), costs are attached and a per pupil cost is determined. This approach best reflects the experiences of people who are actually responsible for delivering education services, which when combined with research results, is viewed as a rational way to specify the resources required to produce a specific level of student performance.

The School Size Study

We have assembled a strong research team to undertake our school size study. Our team will make use of multiple data collection methods to collect current policies on school size enacted by the state's school districts, obtain information on best practices regarding school size and school size policies from around the country, assess the impact or zoning laws on school size, and gain an understanding of the impacts of school size on educational and extracurricular programs. We will also collect quantitative and geographical information systems data from local, state and national sources, to support our analyses of the state and local fiscal impact of smaller schools, the effects of school boundary and attendance area policies on school size, and explore existing opportunities for creating smaller schools.

The Other Maryland Requested Studies

Evaluate the impact of the Community Eligibility Provision on state aid formulas and examine alternative proxies to the number of students eligible for free and reduced price meal (FRPM) for identifying economically disadvantaged students.

This study will consist of two parts. First, we will assess the potential costs of the Community Eligibility Provision of the Healthy, Hunger-Free Kids Act, both the direct costs of implementing the act and the its impact on the costs of program formulas driven by free and reduced price meal counts. Our analysis will be supported by an examination of the cost experience of states that have implemented the program since 2010. Second, we will explore alternative measures to the use of free and reduced price meal counts as a proxy for economic disadvantage. This study will involve a scan of measures used in other states and a literature review of the research on this topic.

Evaluate current mandated and additional prekindergarten services provided by LEAs and private providers in the State, and evaluate current funding provided for prekindergarten services.

This study will assess the current state of prekindergarten services in Maryland, determine the costs and benefits of moving to universal access to quality programs, and use nationally recognized cost models for assessing alternative approaches to funding prekindergarten services for 3- and 4-year-old children.

Evaluate the equity of the State's education finance structure and current calculation of local wealth used by the State for education aid formulas.

This study will examine the equity of school funding across Maryland's 24 school districts using longitudinal district level revenue and expenditure data. The analysis will make use of generally accepted school finance statistics for both finance equity and fiscal neutrality. The study will also examine trends in school finance over the time period and the impact of changes to the state's funding formula.

Evaluate the impact of increasing and declining enrollments on local school systems.

This study will evaluate enrollment trends in the state's school districts over time and their impact on key areas of school operations, such as staffing, transportation, facilities, and technology. A particular focus of our analysis will be of districts with small enrollments but large geographic area. This work will be informed by the school size study and will explore opportunities for school systems to improve efficiencies and for the state funding formula to mitigate the impact of significant enrollment change.

Evaluate the Supplemental Grants and make a recommendation as to whether they should continue to be funded.

In this study, the project team will evaluate the impact of the Supplemental Grants program on the equity and adequacy of the state's school finance system and on the local impact of

the districts receiving the grants. It will examine both how these funds are being used and their effects on district budgets.

Evaluate the current methodology used to calculate the Maryland Geographic Cost of Education Index and provide any recommendations to change the methodology.

For this study, we will assess how the current Maryland Geographic Cost of Education Index compares to other approaches, such as the comparable wage index, assess the effect of applying the National Center for Education Statistics' wage index to Maryland's school districts, and develop a Maryland-specific comparable wage index using data from the Bureau of Labor Statistics.

Our proposal provides more detailed descriptions of how our research approach will meet the needs of the State of Maryland as they are enumerated in the RFP. We are also including additional information that responds to the attachments required by the RFP. We are confident that the expertise and breadth of experience of the project team we have assembled will result in a set of analyses that exceed the requirements of the RFP. We offer this proposal with no exceptions to the requirements stated in the RFP or potential contract.

Response to Request for Proposals
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4.4.3.5 Minimum Qualifications Documentation

- Letter from Pennsylvania Association of School Administrators
- Letter from Maine State Legislature
- *Costing Out the Resources Needed to Meet Pennsylvania's Public Education Goals*
  By Augenblick, Palaich and Associates
- *An Independent Review of Maine's Essential Programs and Services Funding Act: Part 1*
  By Picus Odden and Associates

Pennsylvania Association of School Administrators
2608 Market Place Harrisburg, PA 17110-9358
(717) 540-4448 (717) 540-4405 fax www.pa,a-net.mg

Apri!Il, 2014

Maryland State Department of Education
200 West Baltimore Street, mailroom
Baltimore, MD 21201
Attention: June Dwyer

Dear Colleague:

I understand the State of Maryland is looking to perform a school funding adequacy study to determine the level of funding needed by its public schools necessary to support each student to be successful in meeting state academic standards and performance requirements. As fanner Executive Director of the Pennsylvania State Board of Education, which during my tenure, conducted a comprehensive adequacy study, I offer my highest recommendation of the firm of APA Consulting to do this type of work.

The Board selected APA Consulting to perform a comprehensive statewide costing-out study using multiple approaches to determine a basic cost per student to provide an education that would permit a student to meet the State's academic standards and assessments. The study also considered additional factors such as disability, home language, socioeconomic status, district size, cost of living and district size. In addition, APA Consulting was asked to review transportation funding and study school districts that are high-performing and low-spending districts. The study considered both adequacy and equity of state and local school funding.

Our experience in working with APA Consulting both during and following the one-year project was most positive. The leaders of the APA Consulting team, including Bob Palaich and Justin Silverstein, were responsive to our direction and requests, always professional and always pleasure to work with. They willingly adjusted their work plan, based on our recommendation, to work closely with a Board selected consultant to assist in identifying and gathering the best data sources available to inform the study which assisted in moving the study forward. APA Consulting also contracted with highly-respected Pennsylvania-based subcontractors to assist in their work, which contributed greatly to the credibility to the study.

Based upon the findings and recommendations contained in study the General Assembly immediately adopted a six-year plan to bring all school districts up to their adequacy targets through the use of a new basic education funding formula. APA Consulting was always responsive to the needs of the Board by standing behind their work long after their contractual obligations had concluded. They provided testimony and responded to questions at several legislative hearings conducted long after the study was completed.

Given my personal experience in working closely with APA Consulting, in what turned out to be one of the most highly visible, high-stakes studies performed by Pennsylvania state government in recent memory, I offer my highest recommendation.

Sincerely,

(jbevJ&e,x

Jim Buckheit
Executive Director

BETH L. ASHCROFT
DIRECTOR

MAINE STATE LEGISLATURE

OFFICE OF PROGRAM EVALUATION AND
GOVERNMENT ACCOUNTABILITY

April 9, 2014

To Whom It May Concern:

In October 2012, the Maine Legislative Council contracted with Lawrence O. Picus & Associates (now Picus Odden & Associates) to provide an independent review of education finance policies and practices associated with Maine's Essential Programs and Services Funding Act. I served as the contract administrator for the Council.

This 18-month project had multiple components including a comparison of Maine's education system with other states, a traditional equity analysis that considered both student and taxpayer equity, an adequacy study of Maine's school funding formula and a comparison of Maine with Picus & Odden's Evidence Based Model. The team made recommendations for changes to Maine's system and developed a simulation model for our future use. Additional deliverables included a study of tribal school funding, a teacher compensation study and a report on ways other states measure and address school districts with differing fiscal capacity. The team came to Maine several times to conduct case studies of improving schools in Maine, lead professional judgment panels and public forums around the state and make presentations before the Joint Standing Committee on Education and Cultural Affairs.

The team provided all deliverables on time and was able to incorporate changes to the work plan as requested by the Committee.

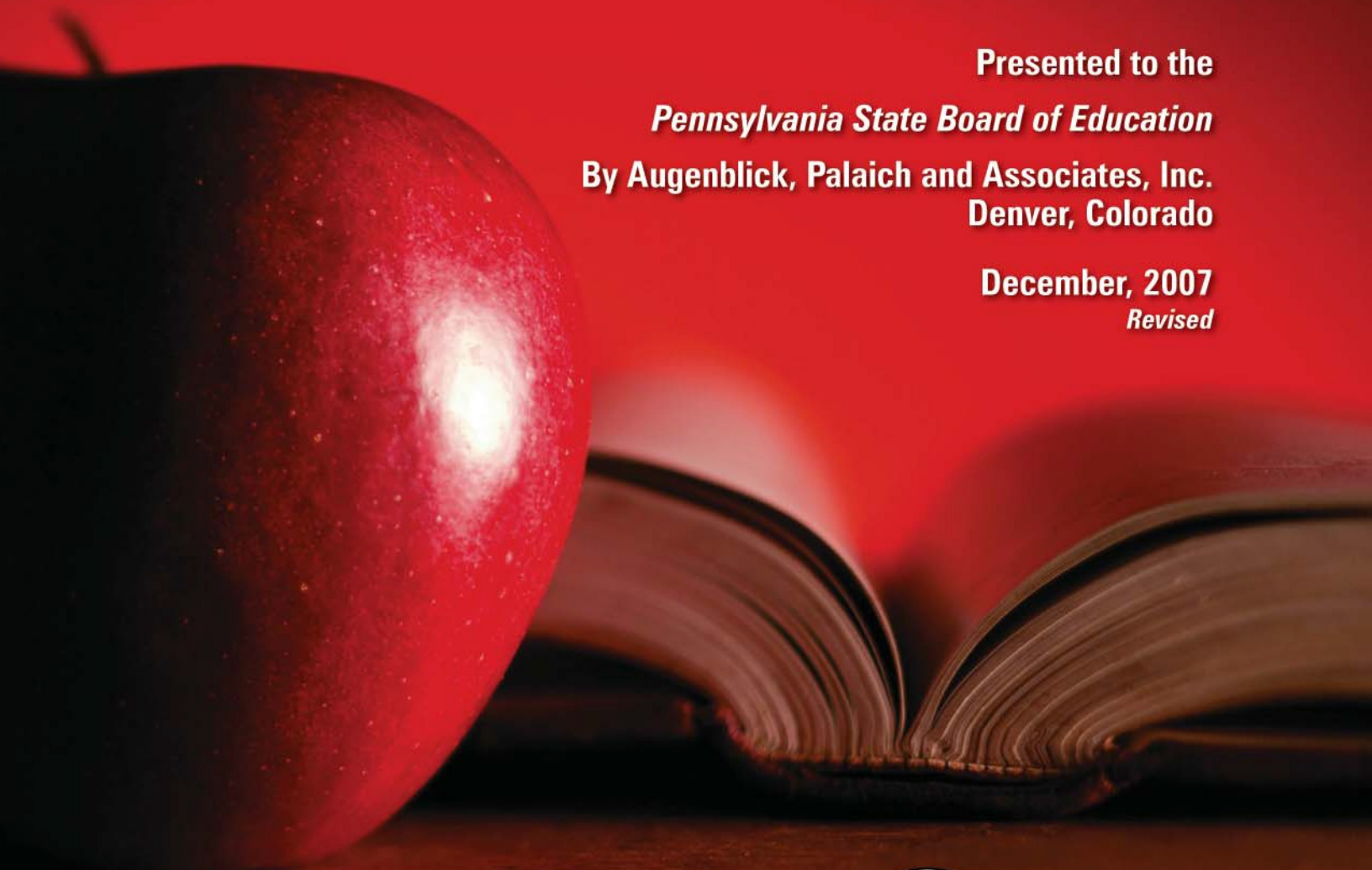
Please contact me at (207) 287-1901 or Dr. Phillip McCarthy, Senior Analyst for the Education Committee at (207) 287-1670, if you desire additional information about this project.

Sincerely,

Wendy Cherubini
Senior Analyst

82 State House Station, Room 107 Cross Building
Augusta, Maine 04333-0082
TELEPHONE 207-287-1901 FAX: 207-287-1906

Costing Out the Resources Needed to Meet Pennsylvania's Public Education Goals



Presented to the

Pennsylvania State Board of Education

By Augenblick, Palaich and Associates, Inc.
Denver, Colorado

December, 2007
Revised

APA
Augenblick, Palaich and Associates, Inc.

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The findings and conclusions contained in this report are those of Augenblick, Palaich and Associates (APA) alone. APA would like to thank the Pennsylvania State Board of Education and the Pennsylvania Department of Education for their cooperation and assistance in gathering essential data requested by APA to complete this report. APA also wishes to thank the numerous panelists who gave their time and energy to participate in this study and whose expertise was extremely useful to inform APA's work. Finally, APA would like to recognize the many contributions of Robert Feir, who served as liaison between APA and the Board, and who played a crucial role in helping ensure that the study moved forward smoothly, efficiently, and with the benefit of the most timely and accurate data possible.

EXECUTIVE SUMMARY

In today's world of increased accountability for student, school and district performance there is ever-increasing pressure on education systems to ensure that all students leave school with the tools and skills they need to succeed in life. Such increased pressure can have a positive influence on performance, but only if policymakers and education leaders also have the capacity to answer what might appear to be a simple question: Do schools and districts have the resources they need to meet state performance expectations?

Education funding is an actively debated topic in states, school districts and communities across the country. Some believe schools already have plenty of resources to fulfill their missions and point to increases in education funding that have been delivered over the past decade. Others, however, believe that schools are in need of additional funds to address uncontrollable and rapidly growing cost pressures. Still others take the position that while some schools are in need of additional funds to successfully carry out their missions, other schools are already sufficiently funded.

Do schools and districts have the resources they need to meet state performance expectations?

In Pennsylvania's case, this means estimating the resources needed so that 100 percent of students can achieve proficiency in reading and math by the year 2014 as well as master state standards in 12 academic areas.

What is true, regardless of one's view on the current condition of school funding, is that many state education finance systems have not addressed the question of what it really costs to meet student performance expectations. In many states, including Pennsylvania, policymakers have developed academic standards and timetables to achieve performance expectations, and they have created accountability systems with consequences for schools and districts when expectations are not met. Most often, however, these expectations and consequences are created without understanding what it costs for schools and districts to meet desired outcomes.

This costing out study is designed to help address this issue in Pennsylvania and to develop a supportable means for policymakers and other education leaders to understand what it will cost for each district in the state to

achieve the performance that is expected of them. In Pennsylvania's case, this means estimating the resources needed so that 100 percent of students can achieve proficiency in reading and math by the year 2014.

The findings in this report were produced pursuant to a study initiated by the Pennsylvania State Board of Education. Under the provisions of Act 114 of 2006, the Board issued a Request for Proposals (RFP) in October 2006 requesting the services of qualified contractors to conduct "a comprehensive Statewide costing out study to arrive at a determination of the basic cost per pupil to provide an education that will permit a student to meet the State's academic standards and assessments." This study — prepared by Augenblick, Palaich and Associates, Inc. (APA), a Denver-based consulting firm that has worked with state policymakers on school funding issues for more than two decades — focuses on determining several key cost elements:

1. The "base cost" of educating an average student in the Commonwealth to meet state performance expectations. This base cost does not include food service costs, transportation costs, costs associated with community services, adult education, capital costs (such as school building construction), or debt service costs.
2. Cost "weights" for educating students with special needs (including students in poverty, special education students, gifted students, and English language learners) to meet performance standards.
3. Additional "cost factors" associated with differences between school districts based on their size, enrollment trends, and regional cost of living.

In addition to determining the scope of the cost elements listed above, APA conducted an analysis of the level of equity which currently exists in Pennsylvania's school finance system. This analysis examines the variations in spending and tax effort that exist across the Commonwealth's school districts. It is also important to note that in this report the term "enrollment" means 2005-06 Average Daily Membership (ADM).

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[1] *Request for Proposals for Education Costing Out Study*, RFP Number CN00022214, Issuing Office: Pennsylvania Department of Education on behalf of the State Board of Education (October 6, 2006); page 20.

Key Findings from APA's Costing Out Analysis

APA's costing out findings were derived from the entirety of our research and analysis conducted in Pennsylvania over the course of the past year. As discussed in Chapter II of this report, APA used a variety of nationally recognized research approaches to analyze and identify the costs associated with meeting the Commonwealth's goal of having all students reach specific performance targets. These targets, which are shown in Appendix D of this report, include achieving mastery of state standards in 12 academic areas and universal student proficiency in reading and math by 2014.

The research approaches used by APA over the past year included a successful school district (SSD) analysis, a professional judgment (PJ) analysis, and an evidence-based (EB) analysis. APA also conducted a cost-function analysis and other analyses designed to understand a variety of issues associated with student transportation, educator wages, change in enrollment, and regional cost of living differences across the state.

While in some cases one methodology or analysis led APA to a particular answer regarding a specific cost factor, in other cases several different approaches all combined to provide several pieces of information that could be used to reach an answer. When combining the data generated through the approaches, APA considered several criteria, including: 1) how strongly the identified data or costs were associated with achieving Pennsylvania's *student performance* goals including universal proficiency in reading and math; 2) the degree to which the data or costs took into consideration *efficiency* and lowest possible cost of resource delivery; 3) the *transparency and reliability* of the data generated; 4) how well the data could be applied to recognize existing school district and student *cost pressure differences*.

APA used a variety of nationally recognized research approaches to analyze and identify the costs associated with meeting the Commonwealth's goal of having all students reach specific performance targets.

Using these four criteria as a guide, APA developed a series of cost factors and combined them in a way that considers efficiency; and identifies a base cost, added cost weights for students with special needs, and additional cost factors associated with differences between school districts.

What follows describes the costs that would have been necessary in 2005-06 to meet the state's performance standard (universal mastery of standards in

12 academic areas and proficiency on state assessments of reading and math) in that year. These costs would need to be modified annually to account for inflation and changes in student demographics in order to achieve the standard in years following 2005-06. Based on 2005-06 spending:

The statewide costing out estimate to reach 100 percent student proficiency and other performance expectations is $21.63 billion.

- The statewide costing out estimate to reach 100 percent student proficiency and other performance expectations is $21.63 billion. This level of spending, with inflationary increases over time, is required for all students to meet Pennsylvania's performance expectations and academic standards.
- About two thirds of the $21.63 billion total cost is associated with the base cost. About 12.6 percent is associated with the added costs of special education, about 9.4 percent of the total is associated with the added cost of serving students from high poverty homes, about 2.7 percent is associated with the added cost of serving English language learners, about 3.9 percent is associated with district size, and about 3.4 percent of the total cost is associated with regional cost of living differences.

The average total costing out estimate per student is $11,926. By comparison, in 2005-2006 school districts in Pennsylvania actually spent $9,512 per student.

- The average total costing out estimate per student is $11,926. By comparison, in 2005-2006 school districts in Pennsylvania actually spent $9,512 per student.
- The base cost per student identified by the costing out study is $8,003.
- There are 471 districts in the Commonwealth whose current spending is below their costing out estimate.
- Current transportation spending appears to reasonably address the costs faced by most school districts and is excluded from this report's costing out figures.
- In the aggregate, the costing out estimate is $4.38 billion higher than current spending (25.4 percent higher than current spending). This number rises to $4.57 billion if those districts that now spend more than required by the costing out estimates continue to do so.

- The Commonwealth's least wealthy districts (based on property wealth and personal income) are the furthest from the costing out estimate of resource needs. On average, the poorest 20 percent of districts have to raise spending by 37.5 percent, while the wealthiest 20 percent only have to raise spending by 6.6 percent.

Key Findings from APA's Equity Analysis

APA's examination of equity starts by measuring variation across several key areas: (1) the student needs in school districts; (2) the wealth of school districts; (3) per student spending for current operations; (4) per student state support; (5) per student local support; and (6) local tax effort. Based on this analysis, we draw conclusions about the level of equity that exists in the Commonwealth's overall school funding system. In order to better understand state support and local tax effort, we also compare the amount of revenue Pennsylvania derives from state and local taxes to the national average and the amounts six nearby states generate. These analyses yielded the following key findings:

1. When wealth is measured by combining property value and income (which is the Commonwealth's current wealth definition), data show a substantial variation in district wealth.

2. With regard to state aid, Pennsylvania's current funding system has positive aspects:

   a. The variation in state aid that districts receive is not very large *if* all cost pressures are taken into consideration. In other words, after controlling for factors such as numbers of students with special needs, differences in district size, and regional cost differences — which allows data to be examined on a "weighted student" basis — state aid is fairly consistent across the Commonwealth.

   b. When cost pressures are not taken into consideration, districts with higher need levels do receive more state funds per enrolled student. Also,

In the aggregate, the costing out estimate is $4.38 billion higher than current spending.

The Commonwealth's least wealthy districts are the furthest from the costing out estimate of resource needs.

On average, the poorest 20 percent of districts have to raise spending by 37.5 percent, while the wealthiest 20 percent only have to raise spending by 6.6 percent.

wealthier districts tend to receive less state aid per enrolled student than poorer districts.

3. The local revenue picture is much less desirable from a public policy perspective:

   a. Looking at districts in terms of student need, data show that Pennsylvania's highest need districts generate the least amount of local revenues, while the lowest need districts tend to generate the most.

   b. Looking at districts in terms of *wealth*, the poorest districts tend to have the highest tax effort while the wealthiest districts have the lowest effort. The wealthiest districts can, in fact, generate more local funds with less tax effort imposed on their citizens.

   c. Because local revenue is almost *twice as much* as state revenue, disparities in how such revenues are generated overwhelm whatever equity is provided through Pennsylvania's state aid. In fact, data show that school district spending is negatively associated with need and positively associated with wealth.

Pennsylvania's poorest districts tend to have the highest tax effort while the wealthiest districts have the lowest.

4. State and local taxes collected in Pennsylvania are comparable to the national average relative to population or personal income, but are 6 to 12 percent lower than those collected in six nearby states. When compared to the simple average tax effort of the six nearby states, Pennsylvania could have collected between $3.17 and $6.02 billion more revenues in 2004, depending on how tax effort is measured.

Compared to the simple average tax effort of the six nearby states, Pennsylvania could have collected between $3.17 and $6.02 billion more revenues in 2004.

The inequity of Pennsylvania's funding system can be summarized by the conclusion that school districts with higher wealth and lower needs spend more than lower wealth districts — and do so while making lower tax effort. If additional revenues are needed to improve student performance, such funds should be collected at the state level and allocated by the state through a formula that is sensitive to the needs and wealth of school districts. By focusing on state funding in this way, Pennsylvania will be better able to reduce the inequities caused by the current heavy reliance on local revenues.

I. Overview

The findings in this report were produced pursuant to a study initiated by the Pennsylvania State Board of Education. Under the provisions of Act 114 of 2006, the Board issued a Request for Proposals (RFP) in October 2006 requesting the services of qualified contractors to conduct "a comprehensive Statewide costing out study to arrive at a determination of the basic cost per pupil to provide an education that will permit a student to meet the State's academic standards and assessments."[2] This chapter: 1) reviews the RFP's key requirements and how these requirements guided the overall analysis; and 2) outlines the performance standard which formed the basis for the costing out analysis.

Study Requirements Outlined by the State Board of Education

The State Board's RFP called for the costing out study to consider both "equity" and "adequacy" in terms of how the Commonwealth of Pennsylvania provides resources to its public schools. With regard to "equity," the Board requested the study to consider whether the resources spent in Pennsylvania on public schools are distributed in such a way that all children have an equal opportunity to succeed in school.[3]

With regard to "adequacy" the State Board required the study to determine whether the funding and resources currently provided to the Commonwealth's schools are sufficient for them to meet performance expectations and to assure academic success for all students. To make this determination, the RFP required use of three nationally-recognized research approaches:

1. A "successful school district" (SSD) approach which examines the spending of high performing school districts as measured against state performance expectations.
2. A "professional judgment" (PJ) approach which relies on the expertise and experience of educators to specify the resources, staff, and programs that schools need to meet performance expectations.

The State Board required the study to determine whether the funding and resources currently provided to the Commonwealth's schools are sufficient for them to meet performance expectations and to assure academic success for all students. To make this determination, the RFP required use of three nationally-recognized research approaches.

[2] *Request for Proposals for Education Costing Out Study*, RFP Number CN00022214, Issuing Office: Pennsylvania Department of Education on behalf of the State Board of Education (October 6, 2006); page 20.

[3] Id.

3. An "evidence based" (EB) approach which uses education research to help provide answers about how resources should be deployed in schools so that students can meet performance expectations.

The RFP specified that these three approaches be used to consider specific student and district-driven factors that might affect the costs and resources needed to meet student performance expectations. The student-driven factors identified by the Board were designed to identify any cost impacts that result from student differences in:

- Poverty.
- Limited English proficiency.
- Special education.
- Gifted and talented ability.

The district-driven factors identified by the Board for inclusion in the study were designed to address cost impacts that result in differences between school districts in terms of their:

- Enrollment (as used in this report, the term "enrollment" means 2005-06 Average Daily Membership (ADM)).
- Enrollment growth or decline.
- Urban or rural location.
- Cost of living.

Following a competitive RFP review process, Augenblick, Palaich and Associates (APA) was selected to conduct the costing out study called for under Act 114 and by the Board's RFP. APA is a Denver-based education policy consulting firm that, for the past 24 years, has worked with state policymakers across the country on school funding and other policy issues. Over this time, the firm has evaluated school finance systems in more than 20 states and has helped to create the school finance systems in Colorado, Kansas, Louisiana, Maryland, Mississippi, Nevada, New Hampshire, Ohio, and South Dakota.

In terms of determining the level of equity in Pennsylvania's school funding system, APA's approach involves analyses from both student and taxpayer perspectives. From the student's perspective, equity is measured by examining the extent of spending variation in school districts throughout the Commonwealth. From the taxpayer perspective, APA analyzes property and other tax data along with district-by-district state aid levels to identify the overall level of variation in taxpayer effort, the relationship of this effort to local tax capacity, and the equity of state aid which districts receive.

In order to cost out the overall level of funding needed to meet performance expectations, APA conducted all three analyses required by the RFP (including the SSD, PJ, and EB analyses). APA also used a series of statistical analyses to strengthen and support the three study

approaches listed above and to provide primary data for other key costing out issues such as geographic cost of living differences, transportation costs, and certain district-driven cost differences including student population growth and decline and population scarcity or density issues.

When combined, all these analyses allowed APA to identify several key cost elements for Pennsylvania's schools to meet performance expectations:

1. The "base cost" of educating an average student in the Commonwealth to meet state performance expectations. This base cost does not include food service costs, transportation costs, costs associated with community services, adult education, capital costs (such as school building construction), or debt service costs.
2. Cost "weights" for educating students with special needs (including economically disadvantaged students, special education students, gifted students, and English language learners) to meet performance standards and to effectively educate the Commonwealth's gifted and talented students.
3. Additional "cost factors" associated with differences between school districts in terms of their size, enrollment change, urban or rural location, and cost of living differences across the state.

Further information on how this work was conducted is provided in the remainder of this report. Subsequent chapters address:

- APA's overall research approach and methodology;
- APA's findings in terms of the cost required for students to meet the Commonwealth's student performance goals;
- The results of APA's equity analysis; and
- A comparison of APA's cost findings with current Pennsylvania spending.

Identifying a Performance Target for Pennsylvania's Schools

Because the purpose of the costing out exercise was to identify the level of resources needed for schools to reach a specific level of performance, an essential element of APA's work was to identify a performance target or "standard" by which all schools would be measured. This target, explained in detail below, represented the single goal by which all of APA's costing out efforts were ultimately measured.

To identify this target, APA turned to the Pennsylvania Accountability System. This system applies to all public schools and districts and is based upon the

The Pennsylvania Accountability System's key goals are that 100 percent of students:

1) Master state standards in 12 academic areas; and

2) Score "proficient" or above on reading and math assessments by the year 2014.

Commonwealth's content and achievement standards, student testing, and other key indicators of school and district performance such as attendance and graduation rates.

The system's key goals are that *100 percent of students*:

1) Master state standards in 12 academic areas; and

2) Score "proficient" or above on reading and math assessments by the year 2014.

With regard to the 12 academic areas, the Commonwealth has adopted academic content standards in 12 disciplines: 1) arts and humanities; 2) career education and work; 3) civics and government; 4) economics; 5) environment and ecology; 6) family and consumer sciences; 7) geography; 8) health, safety and physical education; 9) history; 10) mathematics; 11) reading, writing, speaking and listening; and 12) science and technology.[4] These content standards identify what a student should know and be able to do at varying grade levels in each subject. All students in the Commonwealth must master these 12 standards, as evidenced by locally devised assessments. School districts are given the freedom to design curriculum and instruction to ensure that students meet or exceed the standards' expectations.

With regard to the reading and math assessment goals, student skills are assessed using the annually administered Pennsylvania System of School Assessment (PSSA). Schools are evaluated based on whether they achieved a minimum target level of improvement called Adequate Yearly Progress (AYP) and there are a series of rewards and consequences based on school and district performance. The 2014 reading and math proficiency target is100 percent. The year-by-year performance targets established by the Commonwealth are shown in the table below. It should be noted that, as of 2006, about 68% of the Commonwealth's students achieved proficiency in reading as measured by the PSSA and about 69% were proficient in math.

Table I-1

Requirements for Student Performance on Reading and Math PSSA [5]

Year	2002-04	2005-07	2008-10	2011	2012	2013	2014
Percent Proficient in Reading	45	54	63	72	81	91	100
Percent Proficient in Math	35	45	56	67	78	89	100

For a complete summary of the performance standard which APA identified for purposes of this costing out study, please see Appendix D of this report.

[4] Source: Pennsylvania Department of Education. Retrieved January 8, 2007 from the World Wide Web. http://www.pde.state.pa.us/stateboard_ed/cwp/view.asp?a=3&Q=76716

[5] Source: Pennsylvania Department of Education. Retrieved January 5, 2007 from the World Wide Web. http://www.pde.state.pa.us/pas/cwp/view.asp?a=3&Q=94580&pasNav=|6132|&pasNav=|6325|

II. Costing Out Approaches

As discussed in the previous chapter, APA used three nationally recognized research approaches to achieve a comprehensive look at the costs of meeting Pennsylvania's performance expectations. APA also used a series of statistical analyses to address other key costing out issues, including geographic cost of living differences, transportation costs, and certain district-driven cost differences. The three nationally recognized research approaches included:

1. A "successful school district" (SSD) approach;
2. A "professional judgment" (PJ) approach; and
3. An "evidence based" (EB) approach.

These three approaches were used to analyze resource needs from different perspectives, and to triangulate findings to produce a single cost estimate. This estimate is based on a specific performance target, discussed in the previous chapter and outlined more fully in Appendix D. In addition to other objectives, this target focuses on the goal of having 100 percent of the Commonwealth's students achieve proficiency on reading and math PSSAs, as well as mastering content in 12 academic areas.

In addition to the three primary study approaches, APA also conducted a "cost function" analysis of school district spending in Pennsylvania. This analysis, which was conducted for APA by a team of researchers at New York University, was designed to statistically analyze data to see how spending relates to student performance.

APA utilized three nationally recognized research approaches:

1. A "successful school district" (SSD) approach;
2. A "professional judgment" (PJ) approach; and
3. An "evidence based" (EB) approach.

Detailed descriptions of how APA executed each of the three primary research approaches and the cost function approach are provided below. This is followed by descriptions of additional supporting statistical and cost function analyses that were conducted to examine: 1) geographic cost of living differences; 2) transportation costs, and 3) other district-driven cost differences.

1. The Successful School District (SSD) Approach

The successful school district (SSD) approach examines the spending in those school districts already considered to be high performers in terms of their student results on statewide standardized tests. This approach, therefore, has the inherent advantage of focusing its analysis on those districts that have found ways to successfully educate students to meet performance expectations.

Identifying "Successful" Districts

A school district's "success" or failure can be determined using any number of variables or criteria. In truth, districts deemed "successful" for purposes of this study are those which meet specific criteria selected by APA that are described below. There are, no doubt, other Pennsylvania districts which one might identify as successful or highly effective if different analysis criteria were selected. For instance, researchers could identify successful districts by surveying educators and other experts from around the state, by reviewing performance on standardized tests, or by taking into account other measures such as graduation or attendance rates.

For Pennsylvania's costing out study, APA selected a two-pronged approach to identify successful school districts. This includes:

1. *An "absolute" standard*: This identifies districts whose students currently meet a defined performance standard. For this study, the absolute standard was defined as those districts that currently achieve at levels far above current state performance standards. (State performance standards for the 2005-07 school years require 54 percent of students to be proficient in reading and 45 percent to be proficient in math as measured by the Pennsylvania System of School Assessments (PSSAs)). For our purposes, those districts which currently comply with the Commonwealth's reading and math standards for 2012 were deemed to have met the absolute standard. The 2012 standards require 81 percent of students to score proficient or above on reading assessments and 78 percent to score proficient or above on math assessments. Districts already meeting this high goal can be considered on track to meeting the Commonwealth's 2013-14 goal of 100 percent student reading and math proficiency.

2. *A "growth" standard*: This identifies districts whose *year-to-year growth* in PSSA test scores suggests that they will have 100 percent of students scoring proficient or above by 2014 in both reading and math. For this study, the growth standard was measured by tracking the progress of specific cohorts of students. For example, APA tracked the PSSA scores of each district's 5th graders in 2002, and then examined how those students fared as 8th graders on the 2005 PSSAs. This level of analysis was possible because APA had access to the past five years of PSSA reading and math performance data. The cohorts which APA examined included:

    a. Student 5th grade scores in 2002 and 8th grade scores in 2005;
    b. Student 8th grade scores in 2002 and 11th grade scores in 2005;
    c. Student 5th grade scores in 2003 and 8th grade scores in 2006; and
    d. Student 8th grade scores in 2003 and 11th grade scores in 2006.

For each district, progress was measured by taking the average percentage point increase in performance of all four cohorts combined. This process was done separately for reading and math scores. For example, if two district cohorts averaged a 2 percentage point performance increase per year in reading, and the other two averaged a 4 percentage point increase, the district was deemed to have an average reading growth rate of 3 percentage points per year. Based on current PSSA scores, this 3 percent could then be projected out to 2014 to determine if the district would reach 100 percent reading proficiency.

There are several advantages to using both of the above standards in conducting an SSD analysis. First, using the absolute standard alone could exclude districts which are making significant positive strides in educating their students. Such districts, which might not currently meet the absolute standard, could very well be on track to do so over time. These districts may also be confronted with larger numbers of low income, English language learner, or other special need students, and are worth including in the overall SSD analysis because of their verified ability to improve student performance over time. Second, using a growth standard by itself could result in the exclusion of districts which currently have very high performing students but whose overall growth in performance is slower. These districts may already be performing at such high levels that more rapid growth is more difficult to achieve. By combining absolute and growth standards, the resulting SSD analysis becomes more robust and benefits from two different means of defining success.

Finally, by incorporating a cohort analysis into the SSD approach, APA is able to track how actual groups of students are progressing as they move through school. This is a key piece of information to consider because it allows "success" to be defined, at least in part, by whether a district is able to maintain momentum over time in student learning. For example, the cohort approach allows APA to exclude districts where students may start strong in 5th grade but then show performance decline in middle school. This again provides a more robust view of overall district effectiveness.

Tracking how actual groups of students progress as they move through school is a key piece of information. It allows "success" to be defined, at least in part, by whether a district maintains momentum over time in student learning.

Using the analyses described above, APA identified 67 districts in Pennsylvania which met the absolute standard. We identified 21 districts which met the growth standard. Since there was an overlap of 6 districts between the two groups, the combined analysis yielded **82 total districts**, which formed the core of APA's analysis. The districts which met each standard are listed on the following page.

School Districts Identified Using an Absolute Standard

Abington Heights SD	Freeport Area SD	Moon Area SD	Shanksville-Stonycreek SD
Abington SD	Garnet Valley SD	Mt Lebanon SD	Souderton Area SD
Avonworth SD	Great Valley SD	New Hope-Solebury SD	South Fayette Twp SD
Beaver Area SD	Greensburg Salem SD	North Hills SD	Southern Lehigh SD
Bethel Park SD	Hatboro-Horsham SD	Norwin SD	State College Area SD
Camp Hill SD	Haverford Township SD	Palisades SD	Tredyffrin-Easttown SD
Central Bucks SD	Hempfield Area SD	Parkland SD	Upper Dublin SD
Colonial SD	Jenkintown SD	Penn-Trafford SD	Wallingford-Swarthmr SD
Council Rock SD	Kiski Area SD	Perkiomen Valley SD	West Chester Area SD
Cumberland Valley SD	Lampeter-Strasburg SD	Peters Township SD	West Jefferson Hills SD
Dallas SD	Lower Merion SD	Pine-Richland SD	Wissahickon SD
Derry Township SD	Lower Moreland Township SD	Quaker Valley SD	Wyoming Area SD
Downingtown Area SD	Manheim Township SD	Radnor Township SD	York Suburban SD
Fairview SD	Marple Newtown SD	Richland SD	
Fox Chapel Area SD	Methacton SD	Rose Tree Media SD	
Franklin Regional SD	Midland Borough SD	Salisbury Township SD	

School Districts Identified Using an Growth Standard

Avon Grove SD	Homer-Center SD	Port Allegany SD	Susquehanna Comm SD
Bellwood-Antis SD	Jeannette City SD	Scranton SD	Tri-Valley SD
Cornwall-Lebanon SD	Old Forge SD	South Williamsport A SD	Wayne Highlands SD
General McLane SD	Oswayo Valley SD	Southern Fulton SD	

School Districts That Meet Both Standards

Greater Latrobe SD	North Allegheny SD
Hampton Township SD	Unionville-Chadds Fd SD
Lewisburg Area SD	Upper Saint Clair SD

Examining Successful District Efficiency

APA examined successful district resource efficiency in three key areas: instruction, administration; and maintenance and operations.

An efficiency analysis can help identify those districts that not only outperform others in the state academically, but also those that do so without spending significantly higher resources than their other successful peers. Because Act 114 required an examination of such efficiency, APA took a more comprehensive approach to reviewing the 82 districts identified above. In particular, APA used data provided by Pennsylvania to examine successful district resource efficiency in three key areas:

1. Instruction: Measured by the numbers of teachers per 1,000 students.
2. Administration: Measured by the number of administrators per 1,000 students.
3. Maintenance and operations (M&O): Measured by overall M&O spending per student.

In each of these three areas, APA conducted a separate analysis designed to compare the 82 districts with each other. Comparisons were not made to the other school districts in the Commonwealth because the focus of our research — and the priority of this portion of the costing out study — is understanding the spending associated only with those districts that are deemed successful in terms of producing a specific level of student achievement.

For both instruction and administration, APA measured district resource efficiency using a "weighted" student enrollment count. This means that district enrollment numbers were adjusted to reflect the fact that they might have higher numbers of students with special needs. Such students can require significant extra resources to educate effectively, and APA did not wish to identify any of the successful districts as being less efficient simply because they had higher numbers of teachers or administrators due to the higher needs of their students. Using enrollment data for each of the 82 districts, APA applied the following special need student weights:

APA took steps to insure that successful districts were not identified as less efficient simply because they had more teachers or administrators due to the higher needs of their students.

- 1.1 for special education students
- .75 for English language learners (ELL)
- .4 for poverty (the proxy used is the number of students enrolled in the federal free and reduced price lunch program).

These weights were estimated by looking at a variety of studies APA has conducted across the country regarding the added costs required to educate students to meet state and federal performance standards. Such costs are in addition to the base cost of educating every child. APA used prior work to identify these weights because Pennsylvania-specific weights were not generated until the end of this study. For each of the 82 districts, the special need student populations were multiplied by the above weights and added to raw enrollment numbers to generate a new, higher, weighted enrollment number. The number of teachers (for instruction) and administrators (for administration) were then divided by this number to generate weighted numbers of teachers and administrators per 1,000 students. APA did not conduct this weighting analysis for maintenance and operations spending because such spending is not typically considered to be directly related to student academic performance. In particular, districts which spend more on M&O would not ordinarily do so in response to the presence of higher numbers of special need students.

Once the weighted enrollment numbers were determined for each of the 82 districts, APA applied a statistical analysis to identify those successful districts that appear to be more efficient resource users than their peers. For each of the three spending categories (instruction, administration, and M&O) APA used a threshold of 1.5 standard deviations above the average to identify and eliminate the highest resourced districts, and a threshold of 2.0 standard deviations below the average to identify and eliminate the lowest resourced districts. (One standard deviation on either side of the average includes about two-thirds of all cases when values are distributed normally.)

The standard used to eliminate low spending districts was more lenient because the main point of the exercise was to identify efficient districts. Including a measure to exclude potentially extreme low spenders, however, is still important in order to eliminate any data outliers whose resources and spending may be extremely low for reasons of which APA is unaware but which are unrelated to efficiency. In each of the three spending categories APA conducted a separate analysis of the 82 districts, identifying only those that remained after the standard deviations were applied.

APA was able to study the resulting pool of successful, low-spending districts and to combine data gathered from these districts with data generated through the PJ and EB research approaches to develop an overall picture of what the costs are for all of Pennsylvania's students to meet state performance standards.

Analyzing Specific High Performing, Low Spending Schools

In addition to the analysis described above, APA undertook separate work to analyze the practices and education programs used in specific high-performing schools in low-spending Pennsylvania districts. By looking at these schools' policies and practices, we aimed to learn their methods for achieving both proficiency in student performance and efficiency with respect to fiscal expenditures.

Using data from the Pennsylvania Department of Education 2005-06 PSSA reports, APA first identified school districts with: 1) high percentages of students scoring either advanced or proficient on PSSA math and reading tests; and 2) relatively low per-pupil expenditures. Other factors taken into consideration included the percentage of students eligible for free and reduced lunch and the district's geographic location.

APA undertook separate work to analyze the practices and education programs used in specific high-performing schools in low-spending Pennsylvania districts.

This analysis identified seven districts, including: 1) General McLane; 2) Greater Latrobe; 3) Wyoming Area; 4) Avon Grove; 5) Penn-Trafford; 6) Cumberland Valley; and 7) Norwin. APA then identified high-performing schools within those districts. Elementary schools studied included: Avon Grove Intermediate (grades 3-6), Baggaley, Edinboro, Middlesex, and Sara J. Dymond. Secondary schools studied included: Greater Latrobe Junior High, Trafford Middle School, Central Bucks High School East and Cumberland Valley High School.

Each district superintendent was notified if one or more schools within their district was selected. In August and early September of 2007, APA interviewed each school's principal using a standard interview protocol. The interviews were 60 to 90 minutes long in most cases, and addressed these topics:

- Educational program
- Reasons for success
- Leadership experience
- Management team

- Curriculum implementation
- Decision making structures
- District support levels
- Staff configuration
- Teacher quality
- Hiring practices
- Professional development
- Work environment
- Programs for special needs students
- Technology use and support
- Assessment tools used and quality of data analysis
- School climate factors.

The professional judgment approach is founded on the precept that panels of experienced educators can identify the programs and resources schools need to meet state performance expectations.

For each interview topic or category, analysts examined the data across schools, looking for commonalities and exceptions. Findings are incorporated into APA's discussion at the end of Chapter V regarding the types of programs and services in which districts across the Commonwealth might consider investing both current resources and any new resources provided by the state.

2. The Professional Judgment (PJ) Approach

The professional judgment approach is founded on the precept that panels of experienced educators can identify the programs and resources schools need to meet state performance expectations. The costs of such resources are then determined based on a set of specific prices.

For Pennsylvania's costing out study, professional judgment panels were asked to identify the resources needed for 100 percent of the Commonwealth's students to master state standards in 12 academic areas and to reach proficiency in both reading and math (see the Overview section of this report for a more detailed description of the standard that served as the panelists' performance target). Panelists first estimated the resources required for students with no special needs and then separately estimated the resources needed for students with special needs to reach proficiency. Students with special needs include:

- Those in special education programs
- Gifted students;
- Those whose primary language is not English (whom we refer to as English language learners [ELL students]);
- Those who are living in poverty (the count for which we estimate based on eligibility for free or reduced-price lunch).

The professional judgment panels also examined differences in resource needs based on school district size.

Creating Hypothetical Schools

Hypothetical schools are ones designed to reflect statewide average characteristics or the average characteristics of sub-groups of school districts. If it were true that all the schools within Pennsylvania could be reasonably well represented by a single set of hypothetical schools, then a single professional judgment panel would be sufficient to estimate funding adequacy. However, due to the existing variations among Pennsylvania school districts, APA needed to use multiple professional judgment panels, each focused on hypothetical schools and/or districts of different configuration and size.

Some 1,813,480 students attended public schools in Pennsylvania in 2005-06. Those students attended schools in 501 districts of varying size. Based on these observed variations, APA divided the districts into the following groups: 1) "very small" (less than 1,000 students); 2) "small" (1,000-2,499); 3) "moderate" (2,500-4,999); 4) "large" (5,000-9,999); and 5) "very large" (10,000 or more). Philadelphia's characteristics were unique enough that the district was considered to be in its own size group (it is more than six times as large as the next largest district in the state).

For purposes of APA's work, students with "special needs" include those who are:

- Gifted
- In special education
- English language learners
- Living in poverty

After establishing these size groupings, APA then determined the average school characteristics of each group, including school size and grade configuration. APA found that school size varied in the very small and small groups, but remained fairly similar in the moderate, large, and very large category. As such, APA created three sets of hypothetical schools: one set of schools for very small districts, one set for small districts, and another set to represent moderate, large and very large districts.

To address the added cost of students with special needs in hypothetical schools, APA similarly looked at the average characteristics in each of the original five district size groups and identified enrollment levels for each of the five groups. APA reviewed special education percentages and decided the same percentages could be used for all hypothetical schools with all districts having 14 percent of students having mild special education needs, and 2 percent having severe special education needs. Later, based on the recommendations of the professional judgment panels, these percentages were shifted to represent three categories of special education instead of two. The new percentages for special education were: 10 percent in mild special education, 4 percent in moderate and 1 percent in severe.

The percentages of children in poverty and of English language learners (ELL) varied among different size districts. APA identified poverty percentages for the

five hypothetical districts that ranged from 23 to 38 percent, and ELL percentages ranging from less than 1 percent to 3 percent. The percentage for each hypothetical school was based on the statewide average ADM for districts of that size.

Although any levels could be used to estimate cost, by approaching the evaluation for special needs students in this way, APA's analysis gains several advantages. First, the numbers more closely resemble those found in actual schools across Pennsylvania. Second, the use of more realistic numbers means that the professional judgment panelists were better able to relate to the hypothetical schools and districts that they were attempting to create.

Multiple levels of professional judgment panels allowed APA to look at schools and districts of various size and provided ample opportunity for each panel's work to be reviewed.

Professional Judgment Panel Design

Based on APA's previous experience using the professional judgment approach in other states, multiple levels of professional judgment panels were used in Pennsylvania's costing out study. There are several reasons to use multiple panels: (1) it allows for the separation of school-level resources (which include such things as teachers, supplies, materials, and professional development) from district-level resources (which include such things as facility maintenance and operation, insurance, and school board activities); (2) multiple panels can study schools and districts of varying sizes so that APA can determine whether size has an impact on cost; and (3) APA believes strongly in the importance of having each panel's work reviewed by another panel.

In addition to using a series of panels based on differences in school district size, APA also added two panels to focus on resources required for special need student populations to meet performance expectations. Another round of panels was also added that examined resource differences specific to the Philadelphia school district. By convening these additional panels, APA believes the needs of each of these specific sub-groups were more accurately identified and addressed in the overall costing out study.

The panels and additional meetings were structured as follows:

(1) First round panels. Three panels were convened to address the school-level resource needs of the five hypothetical K-12 school districts. As mentioned previously, APA determined that school size was similar in the moderate, large, and very large districts so the school-level needs of these districts were addressed in a single panel. Each panel was charged with designing schools to accomplish a specific set of performance objectives and standards (which are described in detail in the next section on "Professional Judgment Panel Procedures"). The small panel and moderate, large, and very large panel looked at school-level resources needed for "regular" education students, gifted students, students in

poverty, and ELL students, but not special education students. The very small district panel looked at school-level resources for "regular" education students and all special needs student populations, including special education, as well as district-level resources for all students.

(2) Second round panels. Two panels were held to look at resources needed to serve specific student populations. One panel looked at resources in the small districts while the other looked at resources in moderate, large, and very large districts. Each panel reviewed the resources specified by the previous school-level panel for poverty, gifted, and ELL students, then layered in resources for special education students. Each panel also built in the district-level resources needed for each special need student population and the moderate, large, and very large panel "built" three separate sets of district-level resources.

(3) Third round panels. Four district-level panels were held at this stage, one each for small, moderate, large, and very large districts. Each panel reviewed the work of the previous school-level and special needs panel for their size group, and then added in district-level resources for all students.

(4) Fourth round panels. Two additional panels were held to look at resources needed to serve students in Philadelphia. One panel looked at K-8 schools commonly found in Philadelphia, and the other reviewed the work of the very large panel at the school and district level to decide if the resource allocation would be different because of the district's much larger size and urban setting.

(5) Final statewide review panel. The statewide panel reviewed the work of all earlier panels, discussed resource prices, examined preliminary cost figures, and attempted to resolve some of the inconsistencies that arose across panels.

(6) APA held a meeting with career technology center directors and a meeting with intermediate unit executive directors and business officials. The purpose of these meetings was to ensure that costs associated with these entities were included in the professional judgment analysis.

(7) APA conducted additional meetings to assure that each region of the Commonwealth had an opportunity to assist in identifying the factors that affect a school district's ability to meet Pennsylvania performance standards. These meetings included school board directors; members of the business community, members of the education support community, and parents. Participants discussed a wide range of factors that impact the ability of school districts to

meet Pennsylvania performance standards including, among others, special education and the Individuals with Disabilities Education Act; No Child Left Behind; Pennsylvania education finance policies including taxation issues; health and retirement costs; charter schools; family characteristics; and geographic location issues.

All panels had 5-8 participants, including a combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, and school business officials. In total, 66 panelists participated in the five rounds of panels.

In order to assemble the panels APA provided a list of preferred job titles, as well as some suggestions for selection criteria such as: (1) participants should be from districts that fit within the size range of the panels they would be serving on (e.g., for the small district panel participants were asked to be from districts of less than 1,500 students); (2) participants should be experienced, preferably in more than one district, and, if possible, should have received recognition for excellence; and (3) participants should, in the aggregate, represent all regions of the state.

The State Board of Education received a list of nominations for potential panelists from various sources, including education organizations, advocacy groups, colleagues, and self-nominations, and forwarded the list of nominees to APA, which then selected panelists based upon a balance of position types and geographic representation.

The first round of panels met in Harrisburg in late March 2007; the second round of panels met in Harrisburg at the end of April; the third round of panels met in early May with two panels in Pittsburgh and two in King of Prussia; and the final statewide review panel met in Harrisburg for a day in mid-August 2007. Panel participants are identified in Appendix A.

Professional Judgment Panel Procedures

The panels followed a specific procedure in doing their work. Panelists first met jointly with APA staff to review background materials and instructions prepared by APA. In particular, panelists were instructed that their task was to identify what constitutes an "adequate" level of revenues for hypothetical schools and districts. To accomplish this task, it was necessary for panelists to understand the state's academic performance standards (these are described in Appendix D of this report). Panelists were instructed to focus on this standard in order to appropriately estimate the resources that schools and districts need to be successful. Panelists were instructed *not* to build their "dream" school, but to identify only those resources specifically needed to meet Pennsylvania performance standards.

Individual panels examined the following types of resources:

1) Personnel, including classroom teachers, other teachers, psychologists, counselors, librarians, teacher aides, administrators, clerks, etc.

2) Supplies and materials, including textbooks and consumables.

3) Non-traditional programs and services, including before-school, after-school, preschool, and summer-school programs.

4) Technology, including hardware, software, and licensing fees.

5) Other personnel costs, including the use of substitute teachers and time for professional development.

6) Other costs, including security, extra-curricular programs, insurance, facilities operation and maintenance, etc.

In the case of several categories of personnel (teachers, principals, instructional facilitators) APA provided panel members with starting figures that reflect best practice research conducted by the Educational Policy Improvement Center (EPIC). These figures were used to stimulate discussion and could be accepted, modified, or rejected by panel members.

Panelists were instructed not to build their "dream" school, but to identify only those resources specifically needed to meet Pennsylvania's performance standards.

It is important to note that capital, transportation, food services, adult education, and community services were excluded from PJ panel consideration. For a variety of reasons, these elements pose data gathering difficulties, are unrelated to the adequacy standard, or are generally too cost-specific to the characteristics of an individual district to be usefully included in a professional judgment adequacy analysis.

For each panel, the figures recorded by APA represented a consensus agreement among members. Panelists were instructed to identify the amount of resources (e.g., number of teachers) needed to meet the performance expectations, not to estimate the actual costs of providing those resources. At the time of the meetings, no participant (either panel members or APA staff) had a precise idea of the costs of the resources that were being identified. This is not to say that panel members were unaware that higher levels of resources would produce higher base cost figures or weights. But without specific price information and knowledge of how other panels were proceeding, it would have been impossible for any individual, or panel, to suggest resource levels that would have led to a specific base cost figure or weight, much less a cost that was relatively higher or lower than another.

3. The Evidence-Based (EB) Approach

The evidence-based methodology uses educational research to identify strategies that are the most likely to produce desired student performance outcomes. Strategies may include class size reductions, interventions for special student

populations, summer school, or professional development. Researchers typically undertake a literature review to identify the most effective educational strategies, estimate the cost of implementing each strategy, and adjust the costs based on school or district differences. The model is based on the theory that research-based practices hold the key to educational success and that research findings provide evidence that particular education strategies can be successful in practice. To help conduct this approach, APA worked closely with researchers at the Educational Policy Improvement Center at the University of Oregon.

The evidence-based approach in this study began with a comprehensive review of available literature to identify educational strategies that are likely to be effective in schools. The strategies with the most research support were then presented, via an online simulation, to a panel of teachers, educational administrators, pupil support staff, school board members, and business representatives who were called upon to consider the necessity and relative importance of each strategy. Panelists were encouraged to select only strategies that they believed would be effective in "hypothetical" schools, or schools that represent current (2005-06) enrollments, staffing, and other expenditures in large Pennsylvania school districts at the elementary, middle, and high school levels.

In order to create the simulation, APA needed to focus on one of the hypothetical districts. While any one of the districts could have been selected, APA chose to use the large sized hypothetical district. Large Pennsylvania school districts included those with total enrollments of 5,000 to 10,000 students. Throughout the simulation, panelists were also asked to provide rationales and offer suggestions about the resources necessary to bring student performance to specified levels.

Overall, the evidence-based method used in this study consisted of several key steps:

1. Creating hypothetical schools. Researchers constructed hypothetical schools that represent current service levels and student enrollments in Pennsylvania.
2. Literature review. Researchers conducted a comprehensive literature review to identify educational strategies that are likely to improve the quality of education in Pennsylvania.
3. Identification, recruitment, and training of panelists to participate in an online simulation.
4. Construction of an online simulation. Researchers built an online simulation to present the educational strategies and the current service levels of the hypothetical schools to panelists recruited from across Pennsylvania.
5. Data analysis. The results of the individual simulations were aggregated and analyzed by the researchers.

These steps are described below in greater detail.

The evidence-based methodology uses educational research to identify strategies that are the most likely to produce desired student performance outcomes.

Creating Hypothetical Schools

The purpose of creating hypothetical schools was to provide starting points for considering adequate funding. It is difficult to specify the resources necessary to achieve adequacy without a thorough understanding of the resources that already exist and how they are deployed. The hypothetical schools enabled panelists to examine and consider existing resource allocation levels before determining what resources would be necessary to enable all Pennsylvania students to meet the specified state and federal standards. The hypothetical schools also gave panelists a common frame of reference that was independent of a particular school or district.

To create hypothetical schools, researchers collected data on student enrollment, staffing, and other expenditures from the 64 school districts in Pennsylvania with enrollments between 5,000 and 10,000 students. Researchers relied heavily on the Pennsylvania Chart of Accounts, input from selected school business managers from districts across the state, and data from the Pennsylvania Department of Education in the process of creating hypothetical schools.

Literature Review

To determine the strategies that should be included in the evidence-based study, researchers located, read, and evaluated hundreds of studies, reports, and other sources on effective educational practices.

To determine the strategies that should be included in the evidence-based study, researchers located, read, and evaluated hundreds of studies, reports, and other sources on effective educational practices. The research process first sought to identify educational strategies for which there was direct evidence of improvement in academic performance. Second, researchers reviewed strategies that may have indirect impacts on performance. For example, behavioral support programs may not lead directly to improvements in student achievement because they do not entail instruction in any content area, but there is evidence that these programs increase "time on task" and decrease classroom disruption, both of which are key prerequisites to increasing student learning. Limiting the strategies to only those that directly affect student learning ignores the context within which learning occurs.

When determining which educational strategies to include for review, researchers considered the quantity and quality of studies that supported each strategy. Researchers included only those strategies with strong supportive research. The list of strategies was similar, although not identical, for the elementary, middle, and high school hypothetical schools.

Panelists and Recruitment

Researchers recruited expert panelists from several sources. Education groups across the state (including school boards, school administrators, school business officials and teachers) were asked to nominate individuals from their ranks who were knowledgeable about education effectiveness. In addition, the Pennsylvania State Board of Education recruited local business leaders to participate. From the

nominated list of individuals, we attempted to contact 100 individuals and ask them to participate in the online simulation. Of that number we had accurate information to contact 65 nominated individuals. Before completing the online simulation, all panelists were required to participate in a web-conference training session. Panelists logged into the web-conference and observed at their computers as researchers guided them by phone through a step-by-step demonstration of the structure and content of the online simulation. Researchers trained panelists in the specifics of each page and provided written directions and explanations specific to each page and its elements. Researchers were also available for technical assistance or to answer questions as participants completed the simulation. After the training, panelists were given several weeks to complete the simulation and were able to log into or out of the online simulation at their convenience.

Of the contacted 65, 54 went through the training to participate in the online simulation and 45 of those completed the simulation in the time frame allotted. Table II-1 presents a summary of the panelists completing the simulation. A complete list of participants is provided in Appendix B.

Table II-1: Panelists Completing the EB Simulation

Panelist Title	Number of Panelists Completing the Entire Simulation
Business Representative	7
School Board Member	12
School Program Director, Coordinator, Supervisor, or Business Manager	10
School Pupil Support (Nurse, Speech Therapist, Peer Intervener)	3
School Principal	3
School Teacher	4
Assistant Superintendent	1
Superintendent	5
TOTAL	45

Online Simulation

The purpose of the online simulation was to provide an efficient means to specify the research-based strategies which panelists believe are necessary to ensure an adequate education for Pennsylvania students. Researchers also asked panelists to recommend changes to any and all aspects of the hypothetical schools and their associated educational strategies. Each panelist received an individual link to the online simulation and was able to complete the simulation on their own time and could save their work and come back to it at a later time if needed.

Data Analysis

When all panelists completed their input into the simulation, researchers aggregated and analyzed the results by school level. Researchers calculated the percent of panelists who identified each educational strategy as necessary, and the proportion of these panelists who rated the strategy as "critically important" or "very important." Panelist strategy suggestions and other panelist changes on the adequacy review pages were considered on a case-by-case basis.

Researchers analyzed the data separately for each hypothetical school level because the strategies and their components differed by level. Researchers also aggregated panelist input on the relative importance of each strategy. The importance ratings for each strategy do not impact expenditures, but instead provide additional information for policymakers who are faced with competing priorities and limited budgets. Our findings from this analysis are presented in Chapter III of this report.

4. Supporting Analyses Conducted by APA

APA conducted a series of supporting analyses to strengthen and inform the work conducted using the three primary research approaches discussed above (the SSD, PJ, and EB approaches). This supporting work addressed several key costing out issues, including:

- A cost function analysis of school district spending.
- Cost of living differences based on geography.
- Other district-driven cost differences.
- Transportation costs.

Further detail on this supporting work is provided below.

Cost Function Analysis

A "cost function" analysis of school district spending in Pennsylvania was conducted to statistically analyze data to see how spending relates to student performance.

A "cost function" analysis of school district spending in Pennsylvania was conducted for APA by a team of researchers at New York University. This work was designed to statistically analyze data to see how spending relates to student performance. Data on school district expenditures and other relevant information needed to conduct this analysis were provided by the Pennsylvania Department of Education (PDE), and by the National Center for Education Statistics' Common Core of Data for 2005-2006.

Under a cost function analysis, the definition of "cost" as applied to school districts is the amount of spending per pupil necessary to achieve defined levels of student performance, holding constant input prices and other district characteristics that influence costs.

Economic costs require that resources be used efficiently and that output levels be specified. In this case, output levels were specified in terms of Pennsylvania's student performance expectations.

The approach also assumes that district expenditure per pupil is a function of a variety of factors, including current and past performance, district enrollment size, input prices such as teacher salaries, student characteristics that affect the cost of living, and other district environmental factors. The coefficients estimated from this procedure can therefore help indicate how per-student costs in the average Pennsylvania district change with increased enrollment of students with certain characteristics (such as limited English proficiency or special needs), or with changes in district input prices or other environmental factors, holding performance standards constant.

Geographic Cost of Living Differences

APA analyzed an adjustment factor that can be included in Pennsylvania's education funding formula that takes into account geographic cost of living differences across school districts. The key purpose of this analysis is to identify if there are cost of living differences between districts in different parts of the Commonwealth that impact the cost of delivering education services, and to create a "Location Cost Metric" (LCM), a factor that can be included in Pennsylvania's school funding formula to adjust the amount of state aid districts receive.

APA analyzed an adjustment factor that takes into account geographic cost of living differences across school districts.

The rationale for conducting such an analysis is well established. In fact, it is now widely recognized that cost of living differences can have a significant impact on the ability of districts to provide equivalent education services. This is especially true with regard to labor. To retain teachers and other employees, school districts must be able to offer compensation that is competitive with local non-educational employers, and employee compensation must be sufficient to purchase goods at local prices.

A few states around the country have developed a procedure to quantify cost of living differences. These states use a variety of approaches. Some, such as Ohio, focus on wage differences among districts. Others, such as Florida, have fewer school districts and look at the cost of delivering a wide range of education goods and services in order to identify differences among districts.

In Pennsylvania, our analysis focuses specifically on objective measures of the cost of living and of market prices of labor. We do not, therefore, seek to address any differences between districts or regions that might affect their "attractiveness" to potential employees. Such an attractiveness analysis would need to address myriad subjective factors (for example, recreational opportunities and overall quality of life) that we believe are not useful (or easily quantified) for inclusion in a state education funding formula.

APA's approach to studying cost of living differences is to focus jointly on the costs of acquiring and of retaining labor. We choose this focus because, as in most states, labor in Pennsylvania represents approximately 80 percent of all school district operating costs. This makes it by far the most important driver of district cost differences. Because the remaining 20 percent of district costs do not show sizable and consistent regional differences over time, APA holds this 20 percent constant across districts in its LCM formula: .20 + (.80 x Personnel Cost Factor).

Labor in Pennsylvania represents approximately 80 percent of all school district operating costs.

With this focus on labor costs in mind, the main focus of APA's work to develop an LCM was to identify the primary costs employees face. For this work, three sets of data were used:

1. The 2006 Council for Community and Economic Research (ACCRA) cost of living data for metropolitan areas in Pennsylvania;
2. U.S. Department of Housing and Urban Development (HUD) estimates of the market cost of two and three bedroom apartments in each county; and
3. National Center for Education Statistics (NCES) data by William Fowler and Lori Taylor on the Comparable Wage Index (CWI) for each school district for 2004 (the most recent available year).

Using the first two sets of data, APA divided the primary costs that employees face into two categories: housing and non-housing expenses.

- Housing costs: To address employee housing costs, APA used HUD data to calculate the estimated cost of a 2.5 bedroom rental in each Pennsylvania county. School districts were then assigned the housing cost of the county where they were located.
- Non-housing costs: From the ACCRA data, APA calculated an average cost of non-housing expenses for Pennsylvania. An average can be used for these costs, because non-housing expenses (especially in non-metropolitan areas) vary much less from place to place than housing costs do. APA applied this statewide average to all non-metro school districts. For metropolitan areas, however, APA applied the specific non-housing costs which were available for each area.

Once housing and non-housing costs were identified, APA was able to calculate a regional cost of living index. First, APA calculated state averages, weighting for 2000 population, and scaled the scores so that the state averaged 100. APA created a COLI (cost of living index) by weighting the non-housing costs at 72 percent and the housing costs at 28 percent. These percentages are consistent with the national average as shown by ACCRA data.

To include the employer aspect of cost of labor, APA then also scaled the CWI data so that the state averaged 100. The Personnel Cost Factor comprises 50% CWI and 50% COLI. To calculate the LCM, each district was assigned 20 percent

of identical costs for non-personnel items. For the estimated 80 percent in personnel costs, the labor cost index is used.

The cost index generated through the LCM analysis is provided in Appendix E of this report.

Other District-Driven Cost Differences

To address other costs that are driven by differences between Pennsylvania's school districts, APA conducted a variety of statistical and data analyses. These were designed to examine differences in such factors as wage and salaries and student enrollment change.

With regard to analyzing wage and salary issues, APA drew upon 2005-06 statewide data provided by the Pennsylvania Department of Education. This data included salaries, full time employees, total years of experience, and education for all teachers across the Commonwealth. Using this data, we examined statistical trends in the data with regard to how teachers are paid based on both their level of education and on their experience.

APA conducted a similar analysis at the district level. We controlled for differences in district cost of living by using the Personnel Cost Factor (which, as described in the geographic cost of living discussion above, represents that portion of the LCM that varies by district). APA also used district salary data, provided by the PDE, to analyze trends in how districts pay teachers based on their education and experience, including how salary schedules provide step increases in pay.

In order to analyze the impact of student enrollment changes on district cost, APA's analyzed district spending in Pennsylvania. We identified three elements of student cost:

1. Fixed cost: Some district cost occurs before a student ever arrives. These costs, which include such items as maintaining a district headquarters and staff and the need to comply with paperwork, record-keeping, and basic legal requirements, are embedded in every district's operations.

2. Current cost: Most of this cost occurs when the student attends school in the district.

3. Post cost: Some costs linger even after a student is gone from the district. Teachers, for instance, are hired and remain in their jobs despite minor fluctuations in enrollment from year to year.

This three-fold view more accurately recognizes that not all costs respond immediately to enrollment changes. Instead, some operating costs immediately appear or disappear when a student enrolls or leaves a district, while other costs may take up to five years to appear or disappear. For instance, a single student can

often be added in October to an existing school with few extra expenses for teacher salaries, heating, or supplies. Similarly, the loss of a student in October might have comparatively little impact on the same factors of salary and other expenses. However, eventually changes in the number of students enrolled, and the teachers required to teach them, will match up and each extra student will produce added expense.

Not all costs respond immediately to enrollment changes. Some may take up to five years to appear or disappear.

To analyze the effects of enrollment change in Pennsylvania, APA used district spending and enrollment patterns to specify how much of the average student expense is borne in the first year, how much in the second, and so on. Viewed from a different perspective, APA sought to identify how much of the current expense is due to this year's enrollment and how much is left over from previous enrollment levels.

Our approach, which we have used in similar fashion to analyze enrollment change costs in other states, was to assume that:

- The total expense for any student is spread over five years (the current year and four prior years); and
- There is a single ratio between the expense for one year and for the next.

To identify the appropriate ratio of expense from one year to the next, APA analyzed data on spending changes in Pennsylvania from 2004-05 to 2005-06 and modeled it as the result of enrollment changes over five years. Specifically, we divided spending in 2004-05 by spending in 2005-06 and modeled it as a function of enrollment in each of the years 2005-06 to 2001-02, divided by the 2005-06 enrollment, which leaves a constant (2005-06 enrollment divided by itself) and four variables.

The results of this analysis were applied to the overall costing out estimate, and are described in Chapter III of this report along with APA's other findings.

Transportation Costs

As part of this costing out study, APA undertook an analysis to better understand the current system by which school districts transport their students to and from school and other activities, and the associated resources required to operate this system. Through this analysis, APA also sought to identify whether changes in the current system were warranted to either improve service delivery or to improve overall efficiency. Our conclusion, based on the work described below, is that Pennsylvania already has in place a rather precise and sophisticated system for measuring transportation costs. This system has evolved over time and now appears to properly account for a variety of cost pressures which different school districts currently face. The system also appears to be working reasonably well in allocating resources to districts to properly account for these different cost pressures. With these considerations in mind, altering the current transportation funding approach is not warranted.

As part of APA's transportation Cost Study, APA conducted a review of Pennsylvania's current student transportation system, including the nature of state subsidies to school districts; the statutes, regulations, and other policies that govern transportation and impact cost; current state spending on transportation services; and other factors that impact district transportation cost. APA's analysis had several components:

1. Specify and obtain data: APA reviewed Pennsylvania's statutory and other legal requirements for operating a student transportation system. In addition, numerous data elements were required to conduct our analysis. The data elements that were needed were identified and submitted to the Pennsylvania Department of Education (PDE). These included: number of pupils in various groupings; bus data; detailed expenditure data; transportation subsidy data; and other district characteristics. All of these elements were requested for each district and in an electronic spreadsheet format.

2. Conduct data analysis: Using the data provided by PDE, a series of analyses were carried out to provide descriptive statistics about the costs of transportation. Many of the analyses yielded total results as well as results for rural and urban districts. The analyses included:

   - Expenditures by total, current, support, and transportation categories.
   - Percentage of transportation expenditures of total, current, and support expenditures.
   - Density comparisons, both by population per square mile and by students per square mile.
   - Pupils transported, by number, type and proportion of public and nonpublic pupils.
   - Cost per student, state subsidy per pupil, and net cost to district per pupil, and district percent share of transportation costs.

3. Convene an independent panel of experts: A panel of Pennsylvania's transportation experts was convened to recommend ways of improving efficiency in school transportation and to recommend indicators of performance and benchmarks in transportation. The Transportation Committee (TC) of the Pennsylvania Association of School Business Officials (PASBO) served as the panel of experts. Eighteen members met to review the preliminary data analyses of transportation and to brainstorm about efficiency and measuring performance in school transportation. The range of members on the panel included school business managers, school district and intermediate unit transportation directors and supervisors, representatives of school transportation services contractors, Pennsylvania State Police, PDE financial officials,

Pennsylvania already has in place a rather precise and sophisticated system for measuring transportation costs. This system has evolved over time and accounts for a variety of cost pressures.

and Pennsylvania Department of Transportation and PASBO administrators. They provided a variety of insights and comments regarding transportation services and the relation with transportation expenditures. The discussion below is drawn from this discussion.

Through these analyses, APA was able to generate an overall view of Pennsylvania's transportation funding system. Transportation is an optional service for school districts in the Commonwealth. School boards are authorized by law to provide transportation, but it is not a mandatory service for school districts. However, if the district does elect to provide transportation services for their students, they must then comply with the state statutes and regulations that govern pupil transportation.

The Commonwealth's subsidy to school districts for student transportation is designed to support a portion of the costs incurred by school districts that provide such services. The amount and state share will vary from district to district, but overall the state provides approximately one-half of the districts' transportation costs. It functions as a reimbursement system in that districts receive subsidy payments in one year based on operating costs the prior year.

The regular transportation subsidy calculation for each district is a complex series of formulas that are based on the operation of each individual bus involved in providing transportation services (either district-operated or contracted service), a cost (inflation) index, deductions for ineligible students transported (those transported that live less than a specified maximum walking distance from school), the wealth of the district, and an excess cost payment to limit the district's cost to one-half mill. Additional adjustments are made for nonpublic school students, hazardous route students, transportation services provided to the district by intermediate units and area vocational/technical schools, depreciation, and additional subsidy amounts for nonpublic and charter school students transported. In addition to the regular transportation subsidy, school districts also receive an additional transportation subsidy for nonpublic school students that they transport and for charter school students that are transported outside the district boundary.

From its review and the input of its expert panel, APA was able to identify and assess a variety of other factors that affect school district costs and to organize these factors into two main groups:

1. Cost factors that are <u>out of the districts' control</u>:
    a. Geographic area of the district
    b. Student density per square mile
    c. Total number of students in the district

d. Type of students, including those requiring special buses or equipment to transport

e. Number of charter school and nonpublic students

f. Total population density

g. Terrain and physical characteristics of the land in the district

h. Variations in weather across the Commonwealth

i. Cost of fuel

2. Cost factors that are in the districts' control:

a. Number and location of schools operated by the district

b. Location of special need student programs

c. Policies on maximum walking distances allowed for students

d. Policies designed to reduce the length of bus routes

e. School day start and end times

f. District calendars

g. Use of bus fleets to support other community purposes

h. Type of bus and other equipment selected for district use (e.g., seating capacity, fuel type, engine type, communications equipment)

i. Decisions to contract out transportation services or provide services internally.

Because current transportation spending was deemed sufficient, these costs were not included in APA's costing out estimates or in comparisons with actual district spending.

As noted above, many factors come into play that affect transportation expenditures in Pennsylvania's school districts. These result in varied levels of expenditures among districts and there is no single answer to the question "What does transportation cost a district?" Rather, APA's findings, and the input of our expert panelists, indicate that the Commonwealth's current level of transportation spending is sufficient, does as effective a job as is possible in addressing the variety of cost pressures districts face, and balances numerous legal, political, and public policy objectives. Since current transportation spending was deemed sufficient, these costs were not included in APA's costing out estimates or in our comparisons with actual district spending.

III. Costing Out Findings

The primary purpose of a costing out study is to estimate the spending that each and every school district in a state will need to make in order to meet the state's education performance expectations. There are three key elements that must be identified through this work:

1) A base cost;

2) Specific student-driven cost factors that vary between districts; and

3) District-driven cost differences that vary across the state.

The "base cost" represents the cost of educating an average student in the Commonwealth — with no special needs — to meet state performance expectations. This base cost does not include food service costs or costs associated with community services, adult education, capital costs (such as school building construction), or debt service costs. The base cost is the largest single number used to develop the total costing out estimate. However, by itself, the base cost is insufficient to cover the costs of serving students with special needs or to account for the district-wide cost pressures that most districts face.

The "base cost" represents the cost of educating an average student in the Commonwealth — with no special needs — to meet state performance expectations.

Because student and district characteristics can vary considerably, it is important to go beyond simply identifying a base cost when conducting a costing out study. Instead, researchers must identify specific sources of cost pressure (each of which we refer to as a cost factor) and develop an estimate of each cost factor's specific impact. In this way, cost factors can be applied individually to each district's unique circumstances and can be used to develop a much more accurate, overall cost estimate.

As has been discussed previously, some cost factors are associated with the characteristics of particular students and some have fiscal impacts for all students or for districts as a whole. The student-driven factors addressed in this study identify any cost impacts that result from *student* differences in:

- Poverty
- Limited English Proficiency
- Disabilities
- Gifted and talented ability.

The *district-driven* factors addressed in this study are designed to identify cost impacts that result in differences between school districts in terms of their:

- Size
- Enrollment growth or decline
- Cost of living.

APA addresses these cost factors in many cases by creating a set of "weights" which are applied to some or to all students. In the simplest sense, a weight is a number, typically expressed as a two digit figure such as ".37," which reflects the cost of a particular fiscal pressure in relation to a standard cost. For example, if we determine that the cost of providing services (including such items as additional staffing, programs, and equipment) to a group of students with a special need is $500 per student above the standard or "base" cost, and the base cost is $2,000 per student, then the weight would be .25 ($500/$2,000). This weight would be added to the cost of each enrolled student that had the special need.

Student weights are typically used when three conditions are met: (1) there is a variation among districts in the proportion of students requiring services beyond those included in the base cost; (2) the cost of the added services is significant in some, if not all, situations; and (3) it is possible to count students directly or use a proxy measure of the number of students who need the added services. Once all student and district factors have been quantified, it is possible to determine the total number of weighted students in each district and to address district differences in terms of size, enrollment change, or cost of living.

The findings discussed below were derived from the entirety of APA's research and analysis conducted in Pennsylvania over the course of the past year. As discussed in Chapter II of this report, APA used a variety of nationally recognized research approaches to analyze and identify the costs associated with meeting the Commonwealth's goal of having all students reach specific performance targets. These targets, which are shown in Appendix D of this report, include achieving universal mastery of state standards in 12 academic areas, and student proficiency in reading and math by 2014. The research approaches used by APA over the past year included a successful school district (SSD) analysis, a professional judgment (PJ) analysis, and an evidence-based (EB) analysis. APA also conducted a cost-function analysis and other analyses designed to understand a variety of issues associated with student transportation, educator wages, change in enrollment, and geographic cost of living differences.

APA's findings were derived from the entirety of research and analysis conducted in Pennsylvania over the course of the past year.

While in some cases, one methodology or analysis led us to a particular answer regarding a specific cost factor, in other cases, several different approaches all combined to provide a wealth of information that could be used to reach an answer. When combining the data generated through each of the approaches, APA considered several criteria, including: 1) how strongly the identified data or costs were associated with achieving *Pennsylvania's student performance expectations* including universal mastery of state standards in 12 academic areas and proficiency in reading and math by 2014; 2) the degree to which the data or costs took into consideration *efficiency* and lowest possible cost of resource delivery; 3) the *transparency and reliability* of the data generated; 4) how well the data could be applied to recognize existing school district and student *cost pressure differences.*

Costs would need to be modified annually to account for inflation and changes in student demographics.

Using these four criteria as a guide, APA developed cost factors and combined them in a way that considers efficiencies, can be explained relatively easily, and answers the questions posed to all responders to the request for proposals issued by the Pennsylvania State Board of Education. What follows describes the costs that would have been necessary in 2005-06 to meet the state's performance standard (universal mastery of standards in 12 academic areas and proficiency on state assessments of reading and math) that year. These costs would need to be modified annually to account for inflation and changes in student demographics in order to achieve the standard in years following 2005-06. A summary of our findings is shown in Table III-1 below.

Table III-1

Values or Formulas Used to Determine Each Factor Used in Costing Out Estimation

Costing Out Factor		Value or Formula for Factor
Base Cost Base Cost per Student	=	$8,003 in 2005-06
Modification to Enrollment Change in Enrollment Over Time	=	Modified enrollment is calculated as follows based on enrollment in the indicated year: (.52 X 2005-06)+(.26 X 2004-05 + (.13 X 2003-04 +(.06 X 2002-03) + (.03 X 2001-02)
Adjustments to Base Cost District Enrollment (Size)	=	(((-0.05) X (LN of 2005-06 enrollment)) + .483), with a minimum of 0.0
Geographic Price Difference (LCM)	=	See Appendix E for county LCM figures (Allengheny County = 1.00)
Special Education	=	1.30 X all students enrolled in special education programs
Poverty	=	.43 X number of students eligible for free/ reduced-price lunch
English-Language Learners (ELL)	=	((-.023) X (LN of 2005-06 enrollment) +3.753) X number of ELL students, with a minimum of 1.48 and a maximum of 2.43
Gifted	=	((-0.13) X (LN of 2005-06 enrollment) + 1.482) X number of gifted students, with a minimum of .20 and a maximum of .66

Base Cost

As the table shows, after reviewing data generated from all study approaches, APA concluded that Pennsylvania's base cost in 2005-06 needed to be $8,003 per student.

District-Wide Cost Pressures

There are three district wide cost pressures that districts face: (1) the fiscal impact caused by enrollment change over time; (2) the fiscal effect of enrollment level (district size); and (3) the cost implications of geographic price differences.

Three key cost pressures districts face include those associated with size, enrollment change, and geographic price differences.

The fiscal impact of enrollment change is shown in the table above. This factor changes the enrollment in a district based on weighting enrollments in the current year and in four prior years at different levels: (1) .52 for the current year; (2) .26 for last year's enrollment; (3) .13 for enrollment two years ago; (4) .06 for enrollment three years ago; and (5) .03 for enrollment four years ago. Applying these weights to a district that has had constant enrollment in the current year and the prior four years means that this year's enrollment would be used (this is true since the weights add up to 1.00). However, if a district had a declining pattern of enrollment (say, 500 students this year, 550 students the year before, 600 students two years ago, 650 students three years ago, and 700 students four years ago) then the number of students that would be counted this year to determine costs would be higher than the actual count (in the example, 541 students, which is about eight percent higher than the actual count of students in the current year). The higher enrollment count is our attempt to account for the district's inability to fully reduce its resources as rapidly as enrollment decreases.

By the same logic, if a district had the exact opposite situation (growing by 50 students per year to reach 700 students, having started four years ago with 500 students), we would use a count of students this year that would be lower than the actual count (659 students). A more typical situation is one in which enrollment bounces around a bit (say, from current year to four years ago: 600, 625, 620, 635, 650); under this circumstance, APA's formula would count 612.7 students rather than the 600 students enrolled this year.

The formula for calculating the cost impacts due to differences in district enrollment size is also shown in Table III-1. Under the formula shown, every district with an enrollment below 16,000 students would receive a unique size adjustment. No two districts of different enrollment would receive precisely the same adjustment. The examples shown below illustrate the magnitude of the adjustment for selected enrollments.

Enrollment	Adjustment
500	17.2%
1,000	13.8%
2,000	10.3%
4,000	6.8%
8,000	3.4%
16,000	0.0%

This factor indicates that per student costs are higher in smaller districts, declining slowly from over 17 percent at 500 students to zero percent at 16,000 students and higher.

The third district-wide cost factor is the geographic price differential, which measures the extent to which the prices of resources differ from place to place. As discussed in Chapter II, APA used a particular methodology to develop a Location Cost Metric (LCM), which is county-based and indicates the relative costs districts face compared to a standard, which is 1.00. Because the LCM is based on national data, we needed to select a county to serve as the standard in Pennsylvania. APA selected Allegheny County for this purpose because, by doing so, the statewide average LCM is at about the national average (1.00), which is what the data suggest. All other counties are shown in relation to Allegheny County — that is, their costs are shown as being higher or lower than Allegheny County's costs. The LCM ranges from .93 to 1.16, indicating that costs could be as much as 7 percent below Allegheny County's costs or as much as 16 percent above Allegheny County's costs. The LCM for every county is shown in Appendix E.

Four cost pressures related to student characteristics include: special education, poverty, English language learners, and gifted.

It should be noted that APA did not discover any other district-wide factors that required inclusion in the costing out findings. In other states, there has been discussion of factors that are related to district density, to the rural or urban qualities of districts, or to something referred to as "municipal overburden." In APA's view, these types of factors have one of three characteristics: 1) They are difficult to define (no study to APA's knowledge has defined municipal overburden, which speaks to the issue of whether certain communities have needs that other districts do not have that interfere with their ability to support education); 2) they are related primarily to transportation costs (which are related to district population density, which is taken into consideration in allocating state aid for transportation); or 3) they are associated with other factors that APA has already measured (for example, in Pennsylvania's case, APA has accounted for urban or rural factors because such factors are related to district size, poverty, and regional price differences, all of which are accounted for in Table III-1).

Student-Based Cost Pressures

There are four cost pressures that are related to specific student characteristics: 1) special education; 2) poverty; 3) English-language learners; and 4) gifted.

In the case of special education, some states use three classifications to differentiate the level of need for a particular student — mild, moderate, and severe. Pennsylvania currently uses two classifications as the basis of allocating state funding support. However, APA meetings with special education providers suggested that professionals in the Commonwealth believe three classifications should be used. While APA considered three classifications in our analysis of

Pennsylvania's costs, the state does not report data to support such a funding mechanism. Therefore, APA uses a single classification approach based on the actual distribution of special education students. The cost of this classification is estimated to be 2.3 times the base cost (for a weight of 1.3, as shown in Table III-1). For example, if a district had 5,000 students, 700 of whom were students with disabilities, then the added cost would be $7,282,730, or $10,404 per student in special education, unadjusted by the LCM. The special education cost weight identified by APA represents an average across all disability and service delivery groups. Therefore, some students will cost much more than this figure, while some students will cost much less.

The cost weight for students in poverty is .43, or 43 percent above the base cost. The proxy for measuring such poverty is eligibility for the federal free or reduced price lunch program. APA found that this .43 weight was consistent across districts of different sizes, but that there was no indication of a concentration factor of any sort (that is, the weight does not rise as the proportion of enrolled students in poverty rises). This weight covers all the costs of low income students but not the cost of dropout recovery. If a district had 5,000 students, 2,000 of whom were eligible for free/reduced-price lunch, then the added cost would be $6,882,580, or $3,441 per poverty student, unadjusted by the LCM.

The formula for English language learners (ELL) is also shown in Table III-1. This factor is affected by school district size based on the formula shown. Under the formula, every district would receive a unique adjustment for ELL students. The minimum adjustment is 1.48 and the maximum adjustment is 2.43. No two districts of different enrollment would receive precisely the same ELL adjustment, unless they are at the minimum or maximum adjustment level. The examples shown below illustrate the magnitude of the adjustment for selected enrollments.

The cost weight for students in poverty is .43, or 43 percent above the base cost.

Enrollment	Adjustment
500	2.324
1,000	2.164
2,000	2.005
4,000	1.845
8,000	1.686
16,000	1.527

The weight is applied by multiplying the number of ELL students by the base cost and by the weight. For example, if a district had 5,000 students, 40 of which were ELL, then the added cost would be $574,295 (the weight at that enrollment would be 1.794), which is $14,357 per ELL student unadjusted by the LCM.

Finally, we created an adjustment for gifted students. Similar to the ELL weight, the costs vary by district size. Every district will receive a unique adjustment for its gifted students, with a minimum adjustment of .20 and a maximum of .66.

No two districts of different enrollment will receive precisely the same adjustment unless they are at the minimum or maximum level. The examples shown below illustrate the magnitude of the adjustment for selected enrollments.

Both ELL and gifted student weights were found to vary by district size.

Enrollment	Adjustment
500	.660
1,000	.584
2,000	.494
4,000	.404
8,000	.314
16,000	.224

The weight is applied by multiplying the number of gifted students by the base cost and by the weight; for example, if a district had 5,000 students, 250 of which were gifted, then the added cost would be $749,881 (the weight at that enrollment would be .3748), which is $3,000 per gifted student unadjusted by the LCM.

Applying the Costing Out Factors to a Hypothetical School District

In order to better understand how all of the factors described above work together to produce a total cost, we can look at a hypothetical school district and what the cost would be given a set of demographic circumstances. Suppose, for example, that the district had 3,200 students, of which 400 were in special education, 85 were English-language learners, 925 were from families in poverty (as measured by their eligibility for free/reduced-price lunch), and 120 students were gifted. In addition, suppose that the district were in a county with a 1.03 LCM and that enrollment was 3,200 in 2005-2006, 3,140 in 2004-2005, 3,160 in 2003-2004, 3,040 in 2002-2003, and 3,040 in 2001-2002.

In this case, the district would be treated as if it had 3,165 students, which would generate $25,327,894 (3,165 X $8,003) in base cost. The size of the district would generate an additional $2,034,804 (using an enrollment of 3,200, an additional amount of 7.95 percent of the base amount is added for every student in this district). Special education students add $4,161,560 (400 X 1.30 X $8,003). Students in poverty add $3,183,193 (925 X .43 X $8,003). ELL students add $1,290,240. Gifted students add $415,644. The total is $36,409,105. When adjusted by the LCM (that is, when multiplied by 1.03), the total is $37,501,378, or $11,719 per student.

Using this example, with all figures adjusted by the LCM: (1) students in special education would add an average of $10,716 each to the total cost; (2) students in poverty would add $3,545 each to the total cost; (3) ELL students would add $15,635 each to the total cost; and (4) gifted students would add $3,568 to the total cost. While the base cost adjusted for change in enrollment and the LCM is $8,153 per student, $655 would also be added due to the size adjustment, adjusted by the LCM, for a total base cost of $8,808 per student.

IV. Equity Analysis

Education policymakers have been interested in the concept of school finance equity for many years. In fact, interest in fiscal equity in education goes back 150 years, when states first began to provide support for public education. At that time, state policymakers began to recognize that there was tremendous variation across school districts in terms of the scope of the education programs offered, the numbers of educators employed, and the quality of materials that were available to students. State aid was therefore initially provided, at least in part, to equalize the services that were available across school districts.

A century ago, despite the provision of state support, school districts relied on local revenue to provide a significant share of all current operating revenue, which produced large variations across districts in spending and in the level of effort school districts made to raise local support. In the last 35 years, many states worked hard to modify the way they provide aid to schools to better consider the varying needs and wealth of school districts. Even today, however, lawsuits continue to challenge state school finance systems, calling for these systems to be designed so that both funding and the provision of education resources are more strongly related to the needs of students.

School finance equity is concerned with the variations in spending and tax effort that exist across a state's school districts. This is not to say that perfect equality is required. In fact, analysts recognize that some variation is acceptable either because the needs of districts vary — with higher need districts requiring more resources — or because some communities are willing to make a higher tax effort than others in order to generate revenues above the level the state assures for all districts.

Pennsylvania's highest need districts generate the least amount of local revenues, while the lowest need districts tend to generate the most.

Key Findings from APA's Equity Analysis

APA's examination of equity starts by measuring variation across several key areas: (1) the student needs in school districts; (2) the wealth of school districts; (3) per student spending for current operations; (4) per student state support; (5) per student local support; and (6) local tax effort. Based on this analysis, we draw conclusions about the level of equity that exists in the Commonwealth's overall school funding system. In order to better understand state support and local tax effort, we also compare the amount of revenue Pennsylvania derives from state and local taxes to the national average and the amounts six nearby states generate. These analyses yielded the following key findings:

1. When wealth is measured by combining property value and income (which is the Commonwealth's current wealth definition) data show a substantial variation in district wealth.

2. With regard to state aid Pennsylvania's current funding system has positive aspects:

   a. The variation in state aid that districts receive is not very large *if* all cost pressures are taken into consideration. In other words, after controlling for factors such as numbers of students with special needs, differences in district size, and regional cost differences — which allows data to be examined on a "weighted student" basis — state aid is fairly consistent across the Commonwealth.

   b. When cost pressures are not taken into consideration, districts with higher need levels do receive more state funds per enrolled student. Also, wealthier districts tend to receive less state aid per enrolled student than poorer districts.

3. The local revenue picture is much less desirable from a public policy perspective:

   a. Looking at districts in terms of student *need*, data show that Pennsylvania's highest need districts generate the least amount of local revenues, while the lowest need districts tend to generate the most.

   b. Looking at districts in terms of *wealth*, the poorest districts tend to have the highest tax efforts while the wealthiest districts have the lowest effort. The wealthiest districts can, in fact, generate more local funds with less tax effort imposed on their citizens.

   c. Because local revenue is almost *twice as much* as state revenue, disparities in how such revenues are generated overwhelm whatever equity is provided through Pennsylvania's state aid. In fact, data show that school district spending is negatively associated with need and positively associated with wealth.

Pennsylvania's poorest districts tend to have the highest tax efforts while the wealthiest districts have the lowest.

4. State and local taxes collected in Pennsylvania are comparable to the national average relative to population or personal income, but are 6 to 12 percent lower than those collected in six nearby states. When compared to the simple average tax effort of the six nearby states, Pennsylvania could have collected between $3.17 and $6.02 billion more revenues in 2004, depending on how tax effort is measured.

The inequity of Pennsylvania's funding system can be summarized by the conclusion that school districts with higher wealth and lower needs spend more than lower wealth districts — and do so while making lower tax effort. If additional revenues are

needed to improve student performance, such funds should be collected at the state level and allocated by the state through a formula that is sensitive to the needs and wealth of school districts. By focusing on state funding in this way, Pennsylvania will be better able to reduce the inequities caused by the current heavy reliance on local revenues.

Below is a discussion of the procedures APA used to analyze the equity of Pennsylvania's school funding system and to compare state and local tax revenues to those of other states.

Compared to the average tax effort of six nearby states, Pennsylvania could have collected between $3.17 and $6.02 billion more revenues in 2004.

Measuring Equity

While there are numerous ways to measure variation, we have found the most useful statistic to be the *coefficient of variation* (the standard deviation of a distribution of values divided by the mean of the distribution of values) because: (1) it includes all values (some measures, such as the federal range ratio, exclude very high or very low values); (2) it is unaffected by inflation (so that if all values increase to the same extent, the coefficient of variation does not change); and (3) it is easier to interpret than other measures.

Once the extent of the variation in a particular variable is known, it is useful to understand how the variation is related to two primary factors: 1) the needs of districts; and 2) their wealth. It is appropriate that the variation in a particular variable, such as state aid, is positively related to need and is negatively related to wealth. Other variables, however, such as tax effort, should be unrelated to either need or wealth.

APA measures relationships between variables using a "correlation coefficient." This assesses the strength of association between two variables and is easy to interpret using the following guidelines:

- A value of zero indicates no relationship.
- A value of 1.00 indicates a perfectly positive relationship (when one variable increases, the other one also increases).
- A value of -1.00 indicates a perfectly negative relationship (when one variable increases, the other one decreases).
- Values between -.30 and 30 are considered to be weak, values between -.70 to -.30 and between .30-.70 are considered to be of moderate strength, and values above .70 or below -.70 are considered to be strong.

One way to take need into consideration is by weighting students to reflect the fiscal impact of a student characteristic, such as coming from a low income family, or the impact of a district characteristic, such as size. In effect, once the fiscal impacts of all cost pressures have been quantified, it is possible to use "per weighted student" (rather than just "per student") indicators of spending to measure variation. If this is done, the assumption is that there should be no variation in spending since needs have already been taken into account.

School Finance Equity in Pennsylvania

Because Pennsylvania has a large number (501) of school districts, there is an inherent basis for variation in the school finance-related variables mentioned above. Therefore, it is appropriate to begin an analysis of equity by examining the extent of the variation that currently exists across all districts. Previously, we have discussed the cost pressures that school districts face based on student characteristics (such as the proportion of students from low income families) and district characteristics (such as their enrollment size). Given that it is possible to "weight" students to reflect these cost pressures, APA created variables in per *weighted* student terms.

This means that the values we discuss below may look different to those who are familiar with Pennsylvania's current school finance statistics. For example, one might look at the per student spending of a district with 3,250 students and find that it spends $8,956 per student. Using a weighted student approach, however, if we found that the district's weighted student count was 1,040 higher than its actual enrollment for a total count of 4,290 weighted students (rather than the 3,250 "raw" students that had been used to calculate per student spending), then the per weighted student spending would be $6,785 (an increase of 32 percent in the divisor leads to a decrease of about 24 percent in the dividend), which appears to be much lower. Similar adjustments can be made in measuring state aid and local support as well as in how we measure the wealth of school districts. Making this adjustment allows APA to be more precise in comparing these variables to the true needs of districts which we have now measured more accurately than ever before.

One of the most interesting things to understand about Pennsylvania's school districts is the extent to which they vary in their relative needs. We define relative "need" as the ratio of weighted students (weighted for all student and district characteristics) to unweighted students. For example, in the case of the districts mentioned above, there were 3,250 raw, or unweighted, students and 4,290 weighted students. This results in a ratio of 1.32, which can be interpreted to mean that the district's relative need is 32 percent above what it would have been if it had no cost pressures (that is, if it had no students with special needs and no district characteristics that placed unusual cost pressures on it).

We calculated the ratio of weighted to unweighted students for all 501 Pennsylvania districts in 2005-06 and found that the lowest ratio was 1.19, the highest ratio was 2.01, and the enrollment-adjusted average ratio was 1.49. When we say "enrollment-adjusted" we mean that the impact of each district's values are adjusted by the number of raw students enrolled in that district. Therefore, Philadelphia's figure has a much larger impact on Pennsylvania's average than any other district because that district is by far the largest.

The coefficient of variation of the relative need of the 501 districts is .110, which can be interpreted to mean that about two-thirds of all students are in districts that have relative need between about 11 percent less than the average and 11 percent

higher than the average. In school finance terms, the variation in need across school districts is not very large and is somewhat smaller than one might think given the variation that exists in all of the components that make up need (for example, in the proportion of students from low income families, the proportion of ELL students, the changing enrollment of districts over time, and regional cost differences).

In Table IV-1, similar statistics as those described above are shown for other school finance-related variables. The average wealth per weighted student in 2005-06 (based on combining 60 percent of property value with 40 percent of personal income, as is used in the state's school finance system) was $157,429 and wealth varied from $33,691 per weighted student to $2,354,028 per weighted student (the wealthiest district had about 70 times the wealth of the least wealthy district). The coefficient of variation for wealth was .524, which indicates that there is a substantial natural variation in the wealth of school districts.

Table IV-1

Indicators of Variation in School Finance-Related Variables for Pennsylvania School Districts in 2005-06

Indicator of Variation	School Finance-Related Variables					
	Relative Need*	Wealth**	Spending per Weighted Student***	State Aid per Weighted Student***	Local Revenue per Weighted Student***	Implicit Tax Effort****
Student Weighted Average	1.49	$157,429	$6,411	$2,417	$4,610	30.15
Minimum	1.19	$33,691	$4,295	$861	$1,065	3.43
Maximum	2.01	$2,354,028	$11,262	$5,864	$12,557	55.36
Range Ratio	1.69	69.87	2.62	6.81	11.79	16.14
Student Weighted Standard Deviation	0.164	$82,487	$1,029	$962	$2,101	6.29
Student Weighted Coefficient of Variation	0.110	0.524	0.161	0.398	0.456	0.209

* Relative need is the ratio of weighted to unweighted students based on APA weights

** Wealth is the sum of .60 times property value and .40 times income divided by weighted students.

*** Weighted students include all student and district weights.

**** Implicit tax effort is local revenue divided by wealth times 1,000.

The per weighted student spending of districts varies more than need but less than wealth. Theoretically, spending should not vary at all when measured in per weighted student terms if the only objective of the state is to assure that spending matches need. It also should not vary as much as local wealth since such a finding would indicate that wealth is the primary determinant of spending, which goes against an important purpose of providing state support. It should be noted that we are using a constrained definition of spending, which excludes capital outlay and debt services as well as transportation, adult education, and food services. The fact is that spending per weighted pupil varied from $4,295 to $11,262, producing a range ratio of 2.62, with an average of $6,411. The coefficient of variation is relatively high at .161, which can be interpreted as meaning that two-thirds of all students are in districts with spending per weighted student between $5,379 and $7,443.

State aid, which is typically designed to be allocated so that it is positively related to district needs and negatively related to district wealth, should vary across districts. When state aid is shown in per weighted student terms, the primary source of variation should be wealth, which suggests that there would need to be as much variation in state aid per weighted student as there is in wealth per weighted student. As shown in Table IV-1, state aid per weighted student varied from $861 to $5,864, with an average of $2,417. The coefficient of variation, at .398, was high but not as high as the coefficient for wealth. Of greater concern is the fact that local revenue per weighted student varies even more widely than state aid, ranging from $1,065 per weighted student to $12,557 per weighted student. This variation is a concern when one considers that, on average, local funding is almost twice as much as state aid and could therefore have a significant negative impact on the overall equity of the system.

In order to look at tax effort, we developed an indicator of implicit tax effort by dividing local revenue by local wealth (and multiplying by 1,000). Using this approach, implicit local tax effort varied from 3.43 to 55.36 “units”, with an average of 30.15 units. The coefficient of variation of tax effort was .209.

To illustrate variations in need and wealth, APA divided districts into five quintiles containing approximately equal numbers of students (excluding Philadelphia).

The discussion thus far has focused on the extent of the variation in several school finance-related variables among Pennsylvania’s 501 school districts. As mentioned earlier, it is important to understand not only the variation but the relationship of that variation between: 1) school district needs; and 2) school district wealth. In Tables IV-3 and IV-2, we show the correlations between each of the variables and need (Table IV-3) and wealth (Table IV-2). In order to illustrate those correlations, we divided the districts into five groups containing approximately equal numbers of students after excluding Philadelphia; these groups are called quintiles.

Table IV-2

Student Weighted Average 2005-06 District Characteristics Organized into Equal Student Quintiles Based on District Wealth and Excluding Philadelphia

Wealth Quintile	Characteristics of Wealth Quintiles							
	Wealth*	Number of Districts	Number of Unweighted Students	Relative Need**	Spending per Weighted Student***	State Aid per Weighted Student***	Local Revenue per Weighted Student***	Implicit Tax Effort****
1	$78,401	132	322,959	1.59	$5,855	$3,387	$2,566	33.21
2	$121,877	129	321,032	1.45	$6,108	$2,843	$3,724	30.42
3	$155,040	90	321,260	1.44	$6,496	$2,315	$4,850	31.41
4	$197,530	85	322,741	1.39	$6,636	$1,774	$5,868	29.67
5	$286,736	64	317,594	1.40	$7,479	$1,259	$7,659	27.69
Philadelphia	$78,995	1	207,893	1.77	$5,634	$3,177	$2,173	27.50
*Statewide Correlation with Wealth**	1.00	N/A	N/A	-0.44	0.66	-0.71	0.89	-0.26

* Wealth is the sum of .60 times property value and .40 times income divided by weighted students.

** Relative need is the ratio of weighted to unweighted students where weighted students include all student and district weights.

*** Weighted students include all student and district weights.

**** Implicit tax effort is local revenue divided by wealth times 1,000.

In the case of need quintiles, districts were ranked by their relative need (the ratio of weighted students to unweighted students), then placed into the lowest need group until about 20 percent of all students were accounted for, after which the other four groups were created sequentially. A similar procedure, with ranking based on wealth rather than need, was used to create wealth quintiles. Once all districts (except Philadelphia) had been assigned to a quintile, weighted averages of other variables were calculated using all of the districts in the quintile and weighting based on the enrollment of those districts.

Table IV-3

Student Weighted Average 2005-06 District Characteristics Organized into Equal Student Quintiles Based on District Relative Need and Excluding Philadelphia

	Characteristics of Need Quintiles							
Need Quintile	Relative Need*	Number of Districts	Number of Unweighted Students	Wealth**	Spending per Weighted Student***	State Aid per Weighted Student***	Local Revenue per Weighted Student***	Implicit Tax Effort****
1	1.30	79	319,471	$196,979	$6,578	$1,993	$5,593	28.55
2	1.37	108	311,600	$171,287	$6,426	$2,364	$4,842	28.00
3	1.43	114	334,481	$170,483	$6,466	$2,384	$4,862	28.96
4	1.50	111	319,919	$170,825	$6,588	$2,293	$5,062	31.02
5	1.67	88	320,116	$128,379	$6,502	$2,557	$4,271	35.93
Philadelphia	1.77	1	207,893	$78,995	$5,634	$3,177	$2,173	27.50
*Statewide Correlation with Need**	1.00	N/A	N/A	-0.44	-0.25	0.27	-0.42	0.26

* Relative need is the ratio of weighted to unweighted students where weighted students include all student and district weights.

** Wealth is the sum of .60 times property value and .40 times income divided by weighted students.

*** Weighted students include all student and district weights.

**** Implicit tax effort is local revenue divided by wealth times 1,000.

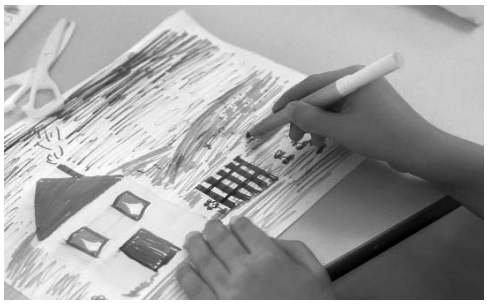
Looking at Table IV-3, where districts have been ranked based on need, it is clear that the average need of the quintiles increases as the number of the quintile (1, 2, 3, 4, and 5) rises. At the bottom of the table is the correlation between need and the variable shown in the column — so the correlation is 1.00 between need (the column) and need (the variable used in all correlations in the table). In the lowest need quintile, there were 79 districts and 319,471 students. There is a moderate, negative correlation between need and wealth (-.44), which is illustrated by the average wealth figures for the quintiles — the highest average wealth is in the lowest need quintile, the lowest average wealth is in the highest need quintile, and the average wealth of the three middle quintiles is similar. Philadelphia exacerbates the pattern because it has relatively high need (1.77) and relatively low wealth (less than half the average of most quintiles). This pattern, which suggests that as wealth rises, need decreases (or vice versa, as wealth decreases, need rises) is not unusual among the states.

Of greater interest is the relationship between spending per weighted student and need, which has a modest but negative correlation of -.25. Looking at the quintiles, it is clear that the average spending of districts in each of the need quintiles is very similar, suggesting that spending is consistent with relative need — the negative correlation appears to be caused by Philadelphia, in which the spending is nearly 15 percent lower than the averages of the quintiles.

There is a low, positive correlation between state aid per weighted student and need. In this case, average state aid is similar across the need quintiles, which suggests that state aid is consistent with district needs and Philadelphia, with high need, receives relatively high state aid. Local revenue, however, is moderately, negatively correlated with need; the lowest and highest need quintiles illustrate this pattern because the lowest need quintile has relatively high local revenue in comparison to the highest quintile, which has relatively low local revenue (the pattern is exacerbated by Philadelphia, which has high need and low local revenue).

Finally, implicit tax effort has a mild but positive relationship with need, although Philadelphia runs counter to this relationship (it has high need and low tax effort). This pattern shows up well in the need quintiles, which indicate that as need increases, average tax effort also rises.

Looking at Table IV-2, where districts have been ranked by wealth, it can be seen that wealth per weighted student (that is, ability to pay in relation to the fiscal pressure school districts face) rises considerably, with the highest quintile having average wealth that is 3.5 times the average wealth of the lowest quintile. It is also the case that the majority of districts (262 out of 501), and a large proportion of all students (about 47 percent), fall in the lowest two wealth quintiles (when Philadelphia is included). It can also be seen that there is a negative relationship between need and wealth, as discussed above.



The equity issue that arises in Table IV-2 is that there is a moderate positive relationship between spending per weighted student and wealth — the spending per weighted student in the highest wealth quintile is about 28 percent higher than the spending in the lowest wealth quintile (and 33 percent higher than Philadelphia, which has wealth just above the average of the lowest wealth quintile). This is because even though state aid per weighted student is negatively associated with wealth (state aid in the lowest wealth quintile is 2.7 times as high as it is in the highest wealth quintile and there is a correlation of -.71 between the two variables), local revenue per weighted student is even more strongly, and positively, associated with wealth.

As was noted earlier, local revenue is about twice the magnitude of state aid on average, with the result that it overwhelms whatever equity state aid provides. The figures in Table IV-2 also demonstrate the negative relationship between district wealth and tax effort — as the average wealth of quintiles rises, the average tax effort decreases (with a weak but negative correlation of -.26 between the two

variables). The inequity of the system can be summarized by the conclusion that school districts with higher wealth, and lower needs, spend more than lower wealth districts — and do so while making lower tax effort.

The Comparative Burden of State and Local Taxes in Pennsylvania

Pennsylvania's state and local tax structure is complex. Nonetheless, the state tax structure is broadly comparable to what exists in other states: 1) the state relies on personal income taxes and sales taxes to each provide a bit more than a third of state general fund revenue; 2) other business and corporate net income taxes, together, provide a little more than a sixth of state general fund revenue; and 3) a variety of commodity, inheritance, and other taxes provide the remaining revenues.

The complexity of Pennsylvania's tax system lies primarily in the variety of local taxes imposed by counties, municipalities, and school districts. These local taxes go beyond the property and sales taxes relied on in most states for local revenue. For instance, Pennsylvania local governments (including school districts) obtain significant revenue from earned income, occupation, per capita, realty transfer, mechanical devices, and personal property taxes, which are authorized under the Local Tax Enabling Act. In the 501 school districts, real estate taxes account for about 80 percent of local taxes. Act 1 of the Special Session of 2006 requires school districts to obtain voter approval for tax increases greater than an annually determined inflation factor.

Now that we have discussed the local tax burden Pennsylvania school districts choose to impose on themselves to support current operations, it is useful to take a broader look at the Commonwealth and how its state and local tax burden compares to both: 1) the national average of all states; and 2) six nearby states (Delaware, Maryland, New Jersey, New York, Ohio, and West Virginia).

APA examined how state and local tax burden compares to the national average and six nearby states: Delaware, Maryland, New Jersey, New York, Ohio, and West Virginia.

In order to set the stage for such an examination, it is important to review two basic characteristics of Pennsylvania: 1) state population; and 2) per capita personal income. Figures for both of these characteristics are shown in Table IV-4. The most recent data is for 2004 and the table shows information for that year and for 1990 in order to understand changes that have taken place in the recent past.

In 2004, Pennsylvania's population was 12,394,000, a figure that had grown 4.3 percent since 1990. In 2004, Pennsylvania had 4.22 percent of the nation's population and was larger than all but one (New York) of its six nearby states. Pennsylvania's population growth has been low compared to both the national average and all but one of the six nearby states (the national average growth between 1990 and 2004 was more than four times higher than in Pennsylvania and only West Virginia had a lower rate of growth during that period).

Table IV-4

Comparison of Pennsylvania to the National Average and to Six Nearby States in Terms of Population and Personal Income Per Capita in 1990, 2004, and Change from 1990 to 2004

States	Population			Personal Income Per Capita		
	By Year (in 1,000's)		Change Between Years	By Year		Change Between Years
	1990	2004	1990-2004	1990	2004	1990-2004
National Average	248,791	293,657	18.0%	$19,542	$34,586	58.8%
Pennsylvania	11,883	12,394	4.3%	$19,717	$34,899	58.2%
Delaware	666	830	24.6%	$21,471	$37,085	53.8%
Maryland	4,781	5,561	16.3%	$22,945	$41,768	59.4%
New Jersey	7,748	8,685	12.1%	$24,626	$43,772	59.5%
New York	17,991	19,281	7.2%	$23,562	$40,504	51.2%
Ohio	10,847	11,450	5.6%	$18,770	$32,476	56.9%
West Virginia	1,793	1,813	1.1%	$14,501	$27,188	64.1%
Simple Average of Six Nearby States				*$20,979*	*$37,132*	*57.5%*

Pennsylvania's per capita personal income has been slightly higher (less than one percent) than the national average for the past 14 years and has risen at a rate comparable to the national average. Compared to the six nearby states, Pennsylvania's per capita income has consistently been about six percent lower than the simple average and lower than the actual levels of Delaware, Maryland, New York, and New Jersey. Between 1990 and 2004, Pennsylvania's per capita income grew slightly faster than the average of the six nearby states although slightly slower than growth in Maryland, New Jersey, and West Virginia. It is interesting to note that Pennsylvania's per capita income is much closer to the national average than any of the nearby states.

The figures in Table IV-5 show how Pennsylvania compares to the national average and six nearby states in terms of the total amount of state and local revenue that is available. In 2004, total revenues in Pennsylvania were $6,344 per capita. This amount was 1.4 percent less than the national average, and was less than all but one of the nearby states (Ohio was $33 per capita lower). Overall, it was 12.3 percent below the simple average of the six nearby states. One source of this revenue is the federal government — Pennsylvania obtained $11 more per capita from the federal government than the national average and received more than four of the six nearby states from this source.

Table IV-5

Comparison of Pennsylvania to the National Average and to Six Nearby States in Terms of State/Local Revenue and Tax Burden in 2004

States	Total Revenue			From State/Local Taxes		
	Total Per Capita	*From Federal Government per Capita*	*From Own Sources per Capita*	*per Capita*	*per $1,000 of Personal Income*	*Percentage of Own Sources from State/Local Taxes*
National Average	$6,435	$1,450	$4,986	$3,440	$104.09	69.0%
Pennsylvania	$6,344	$1,461	$4,883	$3,447	$103.46	70.6%
Delaware	$7,529	$1,316	$6,214	$3,608	$100.82	58.1%
Maryland	$6,613	$1,306	$5,307	$4,016	$101.32	75.7%
New Jersey	$7,092	$1,144	$5,948	$4,555	$109.43	76.6%
New York	$9,303	$2,370	$6,934	$5,260	$137.47	75.9%
Ohio	$6,311	$1,425	$4,887	$3,419	$109.73	70.0%
West Virginia	$6,578	$1,898	$4,680	$2,740	$105.92	58.5%
Simple Average of Six Nearby States	$7,238	$1,576	$5,662	$3,933	$110.78	69.1%

Of the remaining amount, Pennsylvania received 70.6 percent from state and local taxes, which is about the same proportion as the national average and the average of the six nearby states (69.0 and 69.1 percent respectively). Both Delaware and West Virginia relied less on state and local taxes (as a proportion of all state and local revenue). Ultimately, Pennsylvania obtained $3,447 per capita from state and local taxes. This figure was only $7 per capita above the national average, was below four of the six nearby states, and was 12.3 percent below the simple average of the nearby states.

Pennsylvania's per capita personal income has been slightly higher than the national average for the past 14 years

Looking at state and local taxes relative to the income available to pay for them, the table shows that Pennsylvania's burden was $103.46 per $1,000 of personal income. This figure was about .6 percent below the national average, and was lower than four of the six nearby states. It was also 6.6 percent below the simple average of the six nearby states. Increasing state and local taxes to the average of the six nearby states would have produced between $3.17 and $6.02 billion in additional revenue for the Commonwealth in 2004.

This range in additional revenues depends on whether the calculation is based on revenue per $1,000 of personal income, or on revenue per capita. For instance, if

additional revenues are estimated per $1,000 of personal income, the following steps would be taken to calculate the additional revenue (using the data shown in the table above): First, take the six-state average state and local taxes per $1,000 of personal income and subtract Pennsylvania's figure from it. Next, multiply the difference by Pennsylvania's personal income per capita and then divide by 1,000. Then multiply by Pennsylvania's population. This yields the following: $110.78 — $103.46, multiplied by $34,899, divided by 1,000, multiplied by 12,394,000. This yields a figure of $3.17 billion.

If additional revenues are estimated on a revenue per capita basis, one would take the six-state average per capita state and local tax figure, subtract Pennsylvania's figure from it, and multiply the difference by Pennsylvania's population. This yields the following: $3,933 — $3,447 multiplied by 12,394,000 = $6.02 billion.

Looking at state and local taxes relative to the income available to pay for them, Pennsylvania's burden was lower than the national average and four of six nearby states.

V. Comparison of Costing Out Estimate with Current District Spending

Chapter III of this report discussed the base, per-student cost and other cost weights that APA calculated as being necessary for Pennsylvania schools to meet performance expectations. APA also showed how those factors can be applied to each district's specific circumstances. The purpose of this chapter is to show the results of applying the cost factors to all districts in Pennsylvania, to compare the results to actual, comparable spending, and to make those comparisons for groups of districts based on their relative needs and wealth. (Appendix F contains such a comparison for each district).

"Relative need" is based on the ratio of APA-generated weighted students divided by enrollment. "Relative wealth" is wealth per pupil based on personal income and market value of property.

There are several items that should be noted before looking at the four tables that show the comparative information:

- The data are for the year 2005-06.
- The demographic data to which the cost factors were applied are the same as were used in the discussion of equity, all of which came from the Pennsylvania Department of Education.
- Several types of expenditures are excluded: (1) capital outlay and debt service; (2) food services: (3) adult education; and (4) transportation.
- The cost factors used are shown in Table III-1 in Chapter III.
- When districts are organized into groups, the groups are defined using the same quintiles that were used in the discussion of equity in Chapter IV, which shows Philadelphia as its own group in addition to the five quintiles.

Comparing the Costing Out Estimates to Actual Spending

Table V-1 shows the aggregate costing out, organized by need quintiles, and indicates total amounts associated with all cost factors other than change in enrollment over time, which is included in the base cost figure. The table shows the cost for all districts, and it also separates costs for districts in which actual spending levels exceeded those estimated in the costing out from those in which actual spending levels were below those estimated in the costing out. The table is divided into sections as follows: (1) section I indicates the demographic characteristics of the quintiles; (2) section II

shows the statewide total costs of the cost factors; (3) section III shows the total cost per student; (4) section IV shows comparable spending in total and per student terms; (5) section V shows some of the characteristics of districts with spending that exceeds the costing out estimate; and (6) section VI shows some of the characteristics of districts with spending that is less than the costing out estimate.

Table V-1

Comparison of Costing Out Estimates to Actual, Comparable Spending of Pennsylvania School Districts in 2005-06

	Need Quintile Districts, Excluding Philadelphia, Categorized by Relative Need						
I. School District Characteristics	Quintile 1 Low	Quintile 2	Quintile 3	Quintile 4	Quintile 5 High	Philadelphia	Statewide Total
Range in Relative Need of Districts	Less than 1.34	1.34 - 1.40	1.40 - 1.46	1.46 - 1.54	More than 1.54		
Average Relative Need of Districts	1.30	1.37	1.43	1.50	1.67	1.77	
Number of Districts	79	108	114	111	88	1	501
Number of Students	319,471	311,600	334,481	319,919	320,116	207,893	1,813,480
II. Aggregate Costing-Out Estimate (in millions)							
Base Cost	$2,534.8	$2,490.6	$2,671.7	$2,556.0	$2,571.8	$1,679.0	$14,503.8
Regional Cost (LCM)	$5.2	-$27.2	$37.7	$157.0	$216.3	$338.0	$726.9
Enrollment (Size)	$153.5	$187.7	$186.6	$177.3	$132.0	$0.0	$837.2
Special Education	$395.1	$453.4	$519.5	$523.8	$587.6	$251.5	$2,730.9
Poverty	$155.8	$240.5	$299.5	$303.4	$541.0	$502.4	$2,042.5
ELL	$32.9	$40.7	$70.1	$79.7	$203.1	$154.8	$581.2
Gifted	$44.0	$37.7	$40.7	$39.3	$31.4	$12.2	$205.2
Grand Total	$3,321.4	$3,423.3	$3,825.8	$3,836.5	$4,283.1	$2,937.8	$21,627.9
III. Per Student Costing-Out Estimate							
Grand Total	$10,396	$10,986	$11,438	$11,992	$13,380	$14,131	$11,926
IV. Actual, Comparable Spending*							
Aggregate Total (in millions)	$2,727.5	$2,749.1	$3,090.8	$3,159.7	$3,454.8	$2,068.0	$17,250.0
Per Student Total	$8,538	$8,823	$9,240	$9,877	$10,792	$9,947	$9,512

*Figures exclude spending for capital, transportation, and food service

Table V-1 (continued)

Comparison of Costing Out Estimates to Actual, Comparable Spending of Pennsylvania School Districts in 2005-06

	Need Quintile (Districts, Excluding Philadelphia, Categorized by Relative Need)						
	Quintile 1 (Low)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (High)	Philadelphia	Statewide Total
V. Districts with Higher Actual, Comparable Spending than the Costing-Out Estimate							
Number of Districts	4	5	3	7	11	-	30
Number of Students	25,208	13,667	9,622	38,736	59,393	-	146,626
Weighted Average Tax Effort	32.1	28.2	30.3	29.6	27.1	-	31.1
Costing-Out Estimate (Aggregate in millions)	$256.6	$149.0	$110.9	$469.3	$751.8	-	$1,737.7
Actual, Comparable Spending (Aggregate in millions)*	$267.6	$158.7	$117.9	$530.3	$852.0	-	$1,926.5
Actual Spending Over Costing-Out Estimate (Aggregate in millions)*	$11.0	$9.7	$7.0	$61.0	$100.2	-	$188.8
Per Student Spending Over Costing-Out Costing-Out Estimate	$436	$707	$729	$1,574	$1,687	-	$1,288
VI. Districts with Lower Actual, Comparable Spending than the Costing-Out Estimate							
Number of Districts	75	103	111	104	77	1	471
Number of Students	294,263	297,934	324,859	281,182	260,722	207,893	1,666,853
Weighted Average Tax Effort	27.8	27.0	27.4	29.8	34.8	27.5	30.4
Costing-Out Estimate (Aggregate in millions)	$3,064.7	$3,274.3	$3,714.9	$3,367.1	$3,531.3	$2,937.8	$19,890.2
Actual, Comparable Spending (Aggregate in millions)*	$2,459.9	$2,590.5	$2,972.8	$2,629.4	$2,602.8	$2,068.0	$15,323.4
Actual Spending *Under* Costing-Out Estimate (Aggregate in millions)*	$604.8	$683.8	$742.1	$737.7	$928.5	$869.8	$4,566.7
Per Student Spending *Under* Costing-Out Costing-Out Estimate	$2,055	$2,295	$2,284	$2,623	$3,561	$4,184	$2,740

*Figures exclude spending for capital, transportation, and food service

Section I of the table indicates the range of need of the quintiles and the distribution of districts and students into quintiles. Section II indicates that the statewide costing out estimate is $21.63 billion, with about two thirds of the total cost associated with the base cost, 12.6 percent associated with the added costs of special education, 2.7 percent associated with ELL, 9.4 percent associated with the added cost of serving poverty students, 3.9 percent associated with district size, and about 3.4 percent associated with regional cost of living differences.

The costing out estimate per student is $11,926 which rises from $10,396 to $13,380 as district needs rise. In the aggregate, the costing out estimate is $4.38 billion higher than current spending percent). Interestingly, the percentage increase needed to move from actual spending to the costing out estimate is similar across all need quintiles. Philadelphia's increase of 42 percent is nearly double the increases needed, on average, in the need quintiles.

The average total costing-out estimate per student is $11,926.

As shown in section V of Table V-1, there are 30 districts, with 146,626 students with spending higher than the costing out estimate, a third of which are in the highest need quintile (which may be explained by an average tax effort that is higher than average for all districts). In total the 30 districts spend $.2 billion over what the costing out estimate suggests, or $1,288 per student more.

Looking at section VI of Table 1, there are 471 districts with spending that was $4.57 billion below the costing out estimate for them. In one sense, this is the real difference in cost between what is being spent now and the costing out estimate since it does not deduct the extent to which some districts are currently exceeding the costing out estimate.

Table V-2 shows the same information that had been shown in section II of Table V-1 only in per student terms. This is useful in better understanding the impact of the cost factors on the total spending of different need quintiles of districts. For example, it is clear that the base cost figure is not the same, on average, in every quintile, which it would be if the same constant, $8,003, was applied to every student; as mentioned earlier, the base figures have been adjusted to reflect the impact of the enrollment change over time factor (figures below $8,003 indicate that, on average, districts had increasing enrollment over time while figures above $8,003 indicate that, on average, districts had decreasing enrollment over time).

It is also clear that district need is related to geographic cost differences. In fact, only the second lowest need quintile, on average, has an LCM value below 1.00, which results in a reduction in the costing out estimate. It is also true that districts with higher needs receive much higher contributions to their overall costing out estimates from the factors for special education, poverty, and ELL students. In the case of gifted students, the cost factor works in the opposite direction, which suggests that there are higher proportions of gifted students in districts with relatively low overall needs.

In the aggregate, the costing-out estimate is $4.38 billion higher than current spending (25.4 percent).

Table V-2

Comparison of Costing Out Estimates to Actual, Comparable Spending of Pennsylvania School Districts in 2005-06

	Need Quintile Districts, Excluding Philadelphia, Categorized by Relative Need						
I. School District Characteristics	Quintile 1 Low	Quintile 2	Quintile 3	Quintile 4	Quintile 5 High	Philadelphia	Statewide Total
Range in Relative Need of Districts	Less than 1.34	1.34 - 1.40	1.40 - 1.46	1.46 - 1.54	More than 1.54		
Average Relative Need of Districts	1.30	1.37	1.43	1.50	1.67	1.77	
Number of Districts	79	108	114	111	88	1	501
Number of Students	319,471	311,600	334,481	319,919	320,116	207,893	1,813,480
II. Per Student Costing-Out Estimate							
Base Cost	$7,934	$7,993	$7,987	$7,990	$8,034	$8,076	$7,998
Regional Cost (LCM)	$16	-$87	$113	$491	$676	$1,626	$401
Enrollment (Size)	$481	$602	$558	$554	$412	$0	$462
Special Education	$1,237	$1,455	$1,553	$1,637	$1,835	$1,210	$1,506
Poverty	$488	$772	$895	$948	$1,690	$2,416	$1,126
ELL	$103	$130	$210	$249	$634	$745	$320
Gifted	$138	$121	$122	$123	$98	$58	$113
III. Per Student Costing-Out Estimate							
Grand Total	$10,396	$10,986	$11,438	$11,992	$13,380	$14,131	$11,926

*Figures exclude spending for capital, transportation, and food service

Table V-3 shows the aggregate costing out, organized by wealth quintiles, and indicates total amounts associated with all cost factors other than change in enrollment over time, which is included in the base cost figure. As shown in section II of this table, some cost factors are positively associated with wealth, such as the LCM and the gifted factor, while others are inversely associated with wealth, such as the poverty factor. A comparison of the figures in section III to those in section IV indicates that the least wealthy districts are the furthest from the costing out estimate of resource needs. On average, districts in the lowest wealth quintile have to raise spending by 37.5 percent ($12,738/$9,261 per pupil) while districts in the highest wealth quintile only have to raise spending by 6.6 percent ($11,191/$10,501 per pupil).

Table V-3

Comparison of Costing Out Estimates to Actual, Comparable Spending of Pennsylvania School Districts in 2005-06

	Wealth Quintile (Districts, Excluding Philadelphia, Categorized by Relative Wealth)						
	Quintile 1 (Low)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (High)	Philadelphia	Statewide Total
I. School District Characteristics							
Range in Relative Wealth of Districts	Less than $105,078	$105,078 - $139,622	$139,622- $173,666	$173,666- $218,772	More than $218,772		
Average Wealth of Districts	$78,401	$121,877	$155,040	$197,530	$286,736	$78,995	
Number of Districts	132	129	90	85	64	1	501
Number of Students	322,959	321,032	321,260	322,741	317,594	207,893	1,813,479
II. Aggregate Costing-Out Estimate (in millions)							
Base Cost	$2,590.5	$2,577.3	$2,572.4	$2,567.1	$2,517.5	$1,679.0	$14,503.8
Regional Cost (LCM)	-$10.2	-$20.9	$54.3	$100.6	$265.2	$338.0	$726.9
Enrollment (Size)	$186.7	$207.4	$159.4	$163.8	$120.0	$0.0	$837.2
Special Education	$574.7	$509.8	$484.2	$470.2	$440.7	$251.5	$2,730.9
Poverty	$592.5	$363.7	$307.5	$186.8	$89.7	$502.4	$2,042.5
ELL	$153.4	$46.0	$90.2	$68.7	$68.2	$154.8	$581.2
Gifted	$26.2	$33.1	$35.2	$45.4	$53.1	$12.2	$205.2
Grand Total	$4,113.8	$3,716.3	$3,703.2	$3,602.5	$3,554.3	$2,937.8	$21,627.9
III. Per Student Costing-Out Estimate							
Grand Total	$12,738	$11,576	$11,527	$11,162	$11,191	$14,131	$11,926
IV. Actual, Comparable Spending*							
Aggregate Total (in millions)	$2,990.9	$2,836.6	$3,025.8	$2,993.5	$3,335.1	$2,068.0	$17,250.0
Per Student Total	$9,261	$8,836	$9,419	$9,275	$10,501	$9,947	$9,512

*Figures exclude spending for capital, transportation, and food service

Table V-3 (continued)

Comparison of Costing Out Estimates to Actual, Comparable Spending of Pennsylvania School Districts in 2005-06

	Wealth Quintile Districts, Excluding Philadelphia, Categorized by Relative Wealth						
	Quintile 1 Low	Quintile 2	Quintile 3	Quintile 4	Quintile 5 High	Philadelphia	Statewide Total
V. Districts with Higher Actual, Comparable Spending than the Costing-Out Estimate							
Number of Districts	1	-	1	5	23	-	30
Number of Students	903	-	32,556	22,329	90,838	-	146,626
Weighted Average Tax Effort	46.3	-	38.0	36.6	26.0	-	31.1
Costing-Out Estimate (Aggregate in millions)	$12.3	-	$415.0	$267.3	$1,043.1	-	$1,737.7
Actual, Comparable Spending (Aggregate in millions)*	$12.3	-	$490.9	$286.7	$1,136.6	-	$1,926.5
Actual Spending Over Costing-Out Estimate (Aggregate in millions)*	$0.0	-	$75.9	$19.4	$93.5	-	$188.8
Per Student Spending *Over* Costing-Out Costing-Out Estimate	$15	-	$2,330	$869	$1,030	-	$1,288
VI. Districts with Lower Actual, Comparable Spending than the Costing-Out Estimate							
Number of Districts	131	129	89	80	41	1	471
Number of Students	322,056	321,032	288,704	300,413	226,756	207,893	1,666,853
Weighted Average Tax Effort	30.0	28.4	29.5	29.1	27.7	27.5	30.4
Costing-Out Estimate (Aggregate in millions)	$4,101.5	$3,716.3	$3,288.2	$3,335.2	$2,511.2	$2,937.8	$19,890.2
Actual, Comparable Spending (Aggregate in millions)*	$2,978.6	$2,836.6	$2,534.9	$2,706.8	$2,198.5	$2,068.0	$15,323.4
Actual Spending Under Costing-Out Estimate (Aggregate in millions)*	$1,122.8	$879.7	$753.2	$628.4	$312.7	$869.8	$4,566.7
Per Student Spending Under Costing-Out Costing-Out Estimate	$3,487	$2,740	$2,609	$2,092	$1,379	$4,184	$2,740

*Figures exclude spending for capital, transportation, and food service

Section V shows that, of the 30 districts that are already spending above the costing out estimate, 23 districts are in the highest wealth quintile. Not only are these districts spending $1,030 per student over the costing out estimate, their tax

effort is 14 percent below the statewide average. Interestingly, while there is one district in the lowest wealth quintile that spends just more than their costing out estimate, their tax effort is 54 percent over the state average. Section VI reiterates that the lowest wealth districts have the furthest to go in order to make up the difference between actual spending and the costing out estimate; the 131 districts in the lowest wealth quintile need to increase spending by $1.12 billion, or $3,487 per student, while the 41 districts in the highest wealth quintile need to raise spending by $.31 billion, or $1,379 per student.

The per student figures in Table 4 confirm what we discussed above: the LCM, and the gifted factors increase with district wealth while the size factor and poverty factor decrease with wealth. In addition, on average, wealthy districts are growing (as shown by the fact that their base cost figures are below $8,003) while less wealthy districts are declining in terms of enrollment (their base cost figures are higher than $8,003).

Table V-4

Comparison of Costing Out Estimates to Actual, Comparable Spending of Pennsylvania School Districts in 2005-06

	Wealth Quintile Districts, Excluding Philadelphia, Categorized by Relative Wealth						
	Quintile 1 Low	Quintile 2	Quintile 3	Quintile 4	Quintile 5 High	Philadelphia	Statewide Total
I. School District Characteristics							
Range in Relative Wealth of Districts	Less than $105,078	$105,078-$139,622	$139,622-$173,666	$173,666-$218,772	More Than $218,772		
Average Wealth of Districts	$78,401	$121,877	$155,040	$197,530	$286,736	$78,995	
Number of Districts	132	129	90	85	64	1	501
Number of Students	322,959	321,032	321,260	322,741	317,594	207,893	1,813,479
II. Per Student Costing-Out Estimate							
Base Cost	$8,021	$8,028	$8,007	$7,954	$7,927	$8,076	$7,998
Regional Cost (LCM)	-$31	-$65	$169	$312	$835	$1,626	$401
Enrollment (Size)	$578	$646	$496	$507	$378	$0	$462
Special Education	$1,779	$1,588	$1,507	$1,457	$1,388	$1,210	$1,506
Poverty	$1,835	$1,133	$957	$579	$282	$2,416	$1,126
ELL	$475	$143	$281	$213	$215	$745	$320
Gifted	$81	$103	$110	$141	$167	$58	$113
III. Per Student Costing-Out Estimate							
Grand Total	$12,738	$11,576	$11,527	$11,162	$11,191	$14,131	$11,926

*Figures exclude spending for capital, transportation, and food service

Using the Cost Factors in a State School Finance System

This report has made very few references to Pennsylvania's current school finance system or to the specific structure of the procedures the state uses to allocate state aid to school districts. APA was not asked to examine those procedures and they had little impact on our costing out estimates. However, APA believes it is important to note that the very same cost factors used in making our costing out estimates could be used in a state aid formula.

Any state aid formula has two primary components: 1) a component that determines how much revenue school districts are eligible to receive; and 2) a component that determines what portion of that amount the state will pay. The cost factors developed here by APA could be used as the basis for determining how much revenue each school district should receive. However, several issues would need to be resolved before the cost factors could be used in this way. First, since federal funds, not just state and local funds, could be used to pay for estimated costs, it is necessary to take their availability into consideration.

While several issues must first be addressed, the cost factors developed by APA can be used as the basis for determining how much revenue each school district should receive.

Second, it makes sense to decide whether the student cost factors should be considered to be cumulative. In other words, a policy decision would need to be made to address circumstances where students qualify for more than one cost weight (for instance, students who are English language learners and also living in poverty). Students might be allowed to either accumulate the weights or may be limited to eligibility for only a single weight when more than one is applicable.

Third, the cost factors would need to be updated periodically (the base cost should be updated annually). Some approach would need to be developed so that the base cost could keep up with inflation as well as the impacts of extraordinary rises in cost components, such as personnel benefits. Other factors might not need to be reviewed more frequently than every five years.

Finally, if the costing out factors were used to determine eligibility for state aid, we assume that districts currently spending at levels above those estimated using the costing out factors would be able to continue spending at those higher levels, as long as they use their own tax effort to do so. This raises a question about whether all districts should have the opportunity to spend above the costing out estimate and, if so, whether the state equalizes such opportunity. APA's findings show a few districts already choose to spend at very high levels and that local tax effort or wealth seem to facilitate this spending. If more and more districts surpass the costing out estimate of revenue, it might make sense for the state to provide an equal opportunity for all districts to increase their spending above the costing out estimate.

How Might Districts Utilize an Influx of New Funds?

As outlined in this chapter, APA's costing out study finds that substantial added funding is required for schools and districts to meet Pennsylvania's specific performance target. This target, which demands universal student mastery of state standards in 12 academic areas and proficiency in reading and math by 2014, is significant in scope. By seeking to require such universal student proficiency, the Commonwealth has made a policy statement to the effect that, regardless of a student's poverty, physical or mental disability, or English language challenges, all children can and must be educated to reach proficiency in a wide range of academic subjects.

The idea of achieving near universal academic proficiency is one which rightfully resonates well with most citizens. However, no state or country in the developed world has ever achieved this goal and it should come as no surprise that the costs involved can be significant. Now that APA's analyses have identified the extent of these costs for Pennsylvania, a key question for policymakers to consider is: *"How might the Commonwealth's school districts use new funding?"*

How might the Commonwealth's school districts use new funds?

APA does not believe that a "one-size-fits all" approach is the answer to this question.

APA does not believe that a "one-size-fits all" approach is the answer to this question. The relationship between the state of Pennsylvania and its school districts is one that focuses on meeting an overarching education standard, rather than one that requires resources to be deployed in a particular manner, and APA does not believe that this relationship should be fundamentally changed or that uniformity in programs and services should be required. In fact, such uniformity could serve to stifle the types of innovation which individual districts can develop and implement to spur student performance. Such uniformity also ignores the fact that Pennsylvania has 501 school districts, each with unique characteristics and student needs, and that almost all of these districts have locally elected school boards that are fiscally independent.

Instead of a mandated, top-down approach to using any new funds provided as a result of this costing out study, Pennsylvania's policymakers, education leaders, and the public at large might benefit from a better understanding of the range of strategies that can improve student performance. These strategies might be viewed as first options for where schools and districts invest any new resources provided. To identify such strategies, APA draws from:

1) Cumulative research conducted in the Commonwealth over the past year.

2) Input on required resources and personnel provided by numerous panels of experienced Pennsylvania teachers, superintendents, principals, and business officers through APA's professional judgment panel (PJ) work.

3) APA's evidence-based (EB) approach, which reviewed effective education practice research findings from across the country, and the reactions of Pennsylvania experts to those research findings.

4) Direct interviews with leaders from currently successful schools and districts in the Commonwealth.

5) APA's experience working on education policy issues and costing out studies over the past 24 years.

In reviewing all the materials and feedback provided through the five sources listed above, APA identifies an overall list of high priority strategies for Pennsylvania to consider pursuing. These include:

- Targeted funding and programs for students with special needs (including poverty, special education, gifted, and English language learners). Such funding could be used to specifically reduce teacher-student ratios for special need students, to implement behavioral support programs, and to offer more challenging coursework for gifted students.
- Class size reduction, especially in the early grades. Supported in education research literature as a strategy to improve student achievement, smaller class sizes can allow teachers to provide more focused, personalized, and rigorous instruction.
- Full day kindergarten access to ensure that all students enter first grade with the academic skills they need to succeed.
- Expanded preschool quality and program opportunities.
- An extended school day for students that need extra help and to allow appropriate time for targeted tutoring opportunities.
- Expanded summer school programs for students failing to reach academic proficiency.
- Targeted professional development and training opportunities to expand the capacity and expertise of teachers.
- Efforts to keep students on track to high school graduation and reduce dropout rates.
- Expanding the capacity for school principals to become instructional leaders in their buildings by providing full time principals in each school as well as improved training and professional development opportunities. As instructional leaders, principals conduct class observations, make sure that curriculum maps and pacing guides are followed, and ensure that common assessments are used in each grade level.

APA identified a number of high priority strategies in which Pennsylvania should consider investing new resources.

- Increasing access to technology and training to support instruction, including technology designed to help provide teachers with more rapid access to assessment data and other student performance information.
- Targeted staffing increases, including:
  - Counselors, to improve the ability of schools to quickly diagnose and address student emotional or behavioral problems, to coordinate services to address student needs, to help students prepare for success in postsecondary education and careers after graduation, and to serve as a consistent liaison to reach out to parents and families.
  - School nurses, to provide greater access to health care for many students who currently lack access, and to reduce potential liability of schools and districts to handle the increasing numbers of students requiring medication or other medical services.
  - Instructional facilitators, to provide consistent support to teachers in a variety of capacities, such as mentoring newer teachers, helping all teachers understand and integrate data on student performance into their instruction, and ensuring that professional development training is implemented consistently throughout the year in each school.
  - Tutors, to provide more individual, one-on-one instruction for students struggling to reach academic proficiency.
  - Security, to provide added personnel and equipment to ensure the safety of students and staff in middle and high schools.

Considering all the items listed above, several priorities emerged during the course of this costing out study. In particular, targeted funding for special need students, increased school counselor staffing, smaller class sizes, full day kindergarten, professional development tailored to meet teacher needs, and strengthening the capacity of school leaders were consistently identified as crucial areas of need for Pennsylvania's schools.

Funding for special need students, targeted staff increases, smaller class sizes, full day kindergarten, and professional development emerged as priorities.

APA would like to emphasize that the strategies discussed above are not meant to be exhaustive of the types of programs or services for which new resources might be used to reach the Commonwealth's performance expectations. Rather, the list above is intended to allow Pennsylvania educators to benefit from the expertise and insight generated through APA's research, and to provide policymakers and the public a better understanding of how their future tax dollars might be invested.

APPENDIX A

Professional Judgment Panel Participants

PANELIST NAME	PANELIST TITLE
Dr. Charles Amuso	*Superintendent*
Dr. Karen Angello	*Superintendent*
John Barcow	*Teacher*
Cheryl Barnes	*Teacher*
Dr. Dana Bedden	*Superintendent*
Christopher Berdnik	*Director of Finances*
Dr. Patricia Best	*Superintendent*
Sarah Bohnert	*Special Education Teacher*
Brenda Brinker	*Sup of Curriculum*
Tammie Burnaford	*Principal*
Wynton Butler	*Principal*
John Clark	*Title I Coordinator*
Connie Cochran	*ELL Advisor*
Dr. John Cornish	*Superintendent*
Dr. Patrick Crawford	*Superintendent*
Heather D'Angelo	*Special Education Teacher*
Thomas E. Delaney	*Director of Business*
Richard Fantauzzi	*Business Manager*
Stacy M. Gober	*Business Administrator*
Jesus Gomez-Nieves	*ELL Teacher*
Suellen Gourley	*Assistant to Superintendent*
John Gula	*Chair of Music and Performing Arts*
Dawn Hayes	*Teacher*
Dr. Rick Huffman	*Superintendent*
William Kaufman	*Executive Director*
Joseph K. Kimmel	*Principal*
Patricia Kriley	*Director of State & Federal Funds*
Eric Kuminka	*Teacher*
Sharon Rae LaBorde	*Special Education Teacher*
Shavaun Leavy	*Instructional Support Teacher*
Rick Mancini	*Business Manager*
Shelly Mieczkowski	*Special Education Superintendent.*
Mike Ognosky	*Superintendent*
Dr. David Pastrick	*Superintendent*
Dr. Dwight Pfennig	*Superintendent*
Deborah J. Popson	*Principal*
Gretchen Ragazzo	*Teacher*
Dick Rose	*Board Member*
Beth Rubin	*ELL Teacher*
Barbara A. Rudiak	*Principal*
Dr. Roberta Schrall	*Title I Coordinator*
Ralph Scoda	*Business Manager*
Ryan Sherry	*Teacher*
Timothy J. Shrom	*Business Manager*
Anita Siegfried	*Fed Programs Coordinator*
Robert Snyder	*Curriculum Director*
Frank D. Szallay	*Business Manger*
Amy L Todd	*Bus Manager*
Barry Tomasetti	*Superintendent*
Philip J. Waber	*Superintendent*
Thomasina White	*Lead Academic Coach*

APPENDIX B

Evidence Based Analysis Participant List

PARTICIPANT NAME	PARTICIPANT TITLE
Lisa Andrejko	*Educator — Superintendent*
Patricia Bitar	*Educator — Nurse*
Rita Cohen	*Educator — Special Education Director*
Mary Colf	*Educator — Director of Curriculum*
Courtney Collins-Shapiro	*Educator — Director of Multiple Pathways to Graduation*
Laura Cowburn	*Educator — Assistant to the Superintendent*
Marcus Delgado	*Educator — Principal*
Ed Denner	*Educator — Business Manager*
Jean Dexheimer	*School Board Member*
Elizabeth Dutton	*School Board Member*
Linda Fedor	*Educator — Reading Supervisor*
Michael Frist	*Educator — Director of Business*
Stacy Gerlach	*School Board Member*
Kimberly Geyer	*School Board Member*
Diana Gubitosa	*Educator — Teacher*
Linda Hammers	*Business Person*
Judith Higgins	*School Board Member*
Phil Hopkins	*School Board Member*
Lisa A. Jackson	*Educator — Peer Intervenor*
Rudolph Karkosak	*Educator — Superintendent*
Marcia Kile	*Educator — ESL Coordinator*
Deborah Kolonay	*Educator — Superintendent*
Michele Kuma	*Business Person*
Jean Leiboff	*Educator — Retired Speech Therapist*
Reed Lindley	*Educator — Assistant Superintendent*
Robert Lumley-Sapanski	*School Board Member*
Lorraine Mack	*Educator — Director of Educational Programming*
Tom Maher	*School Board Member*
David W. Matyas	*Business Person*
Charlene Miller	*Educator — Teacher*
Alan Ottinger	*Business Person*
David Robbins	*Educator — Superintendent*
Nikki Salvatico	*Educator — Teacher*
Bob Schoch	*Educator — Director of Administration*
Elaine C. Settelmaier	*Educator — Principal*
Sharon Sielski	*Educator — Principal*
Vicki Smith	*School Board Member*
Donald Snyder	*Educator — Teacher*
Shirley Sofranko	*Business Person*
Tina Viletto	*School Board Member*
Beth Wehner	*Business Person*
Kevin Whalen	*Business Person*
Gordon Whitlock	*School Board Member*
Brenda Winkler	*Educator — Superintendent*
Tom Zimmerman	*School Board Member*

APPENDIX C

Preschool Analysis

APA was not asked to include preschool in its costing out estimation (other than preschool for students with special education needs, which are required by law and were included in the cost estimates for special education) .

Preschool was, however, raised by participants in all of APA's professional judgment panels as being essential for four-year-old children to meet the state education standard. Preschool was also one of the education interventions that emerged from APA's review of the education literature that examined the relationship between education programs and student performance.

Based on APA's analysis, it was determined that the cost of preschool (on a half-time basis) is related to school district size in the following way:

Cost of preschool per half-time four year old student = -495 X LN(district enrollment) + $8,851. The minimum result is set at $4,437.

Under the formula, every district would receive a unique cost for preschool students. No two districts of different enrollment will receive precisely the same cost, unless they are at the minimum level. The examples shown below illustrate the magnitude of the adjustment for selected enrollments.

This equation produces the following table of costs for districts of different size:

District Enrollment	Cost per 4-year-old Half-time Preschool Student
500	$5,775
1,000	$5,432
2,000	$5,089
4,000	$4,745
8,000	$4,437

It should be noted that these figures have not been included in the other costing out estimates discussed elsewhere in APA's report.

APPENDIX D

Summary of Pennsylvania Performance Standards

The Pennsylvania Accountability System applies to all public schools and districts. It is based upon the Commonwealth's content and achievement standards, student testing, and other key indicators of school and district performance such as attendance and graduation rates. The system's key goals are that 100 percent of students: *1) master state standards in 12 academic areas; and 2) score "proficient" or above on reading and math assessments by the year 2014.*

Reading and math skills are assessed using the annually administered Pennsylvania System of School Assessment (PSSA) which is a criterion-referenced test used to assess a student's mastery of specific skills.[i] Schools are evaluated on a minimum target level of improvement called Adequate Yearly Progress (AYP) and there are a series of rewards and consequences based on school and district performance.[ii] The 2014 reading and math 100 percent proficiency target is the same end goal contained in the federal No Child Left Behind Act.

Assessment Grades and Subjects[iii]

Pennsylvania has adopted academic content standards in 12 main areas: 1) arts and humanities; 2) career education and work; 3) civics and government; 4) economics; 5) environment and ecology; 6) family and consumer sciences; 7) geography; 8) health, safety and physical education; 9) history; 10) mathematics; 11) reading, writing, speaking and listening; and 12) science and technology.[iv] These standards identify what a student should know and be able to do at varying grade levels. All students in the Commonwealth must master these 12 standards as evidenced by locally devised assessments. School districts are given the freedom to design curriculum and instruction to ensure that students meet or exceed the standards' expectations.

The Commonwealth currently uses the PSSA to test student performance in three areas (reading, writing, and mathematics) to measure attainment of the academic standards. Every Pennsylvania student in grades 3-8 and grade 11 is assessed in reading and math. Every Pennsylvania student in grades 5, 8, and 11 is assessed in writing. As required by NCLB, the Commonwealth is also now developing grade-span assessments in science. Science field tests will be conducted April-May 2007 in grades 4, 8, and 11 and full implementation for these three grades is expected by the 2007-2008 school year. Pennsylvania plans to engage in a standards-setting process to determine specific science performance expectations and to adjust intermediate performance goals as additional grades are added.

Performance against the standards is measured using the level descriptors shown in the following table. Student achievement is classified as either advanced, proficient, basic, or below basic. For schools and districts to meet Adequate Yearly Progress requirements as discussed below, students must perform at the "proficient" level or above.

Table 1: Pennsylvania's General Performance Level Descriptors
Advanced The Advanced Level reflects superior academic performance. Advanced work indicates an in-depth understanding and exemplary display of the skills included in the Pennsylvania Academic Content Standards.
Proficient *(students must perform at this level or above to be considered as having reached the Commonwealth's performance expectations)* The Proficient Level reflects satisfactory academic performance. Proficient work indicates a solid understanding and adequate display of the skills included in the Pennsylvania Academic Content Standards.
Basic The Basic Level reflects marginal academic performance. Basic work indicates a partial understanding and limited display of the skills included in the Pennsylvania Academic Content Standards. This work is approaching satisfactory performance, but has not been reached. There is a need for additional instructional opportunities and/or increased student academic commitment to achieve the Proficient Level.
Below Basic The Below Basic Level reflects inadequate academic performance. Below Basic work indicates little understanding and minimal display of the skills included in the Pennsylvania Academic Content Standards. There is a major need for additional instructional opportunities and/or increased student academic commitment to achieve the Proficient Level.

Adequate Yearly Progress (AYP)

The Commonwealth has developed a system to measure whether districts and schools are on track to meet the state's performance expectations. Each year, school and district performance is analyzed and a determination is made by the state as to whether "Adequate Yearly Progress," or AYP, is being made. Three main criteria are used to determine AYP status:

1. PSSA test results (year-by-year performance goals are shown in Table 2). AYP is judged based either on a subgroup's, school's or LEA's current test score, or its two-year average, whichever is higher;
2. Participation rates on the PSSA (schools must show at least a 95% student participation rate). Schools must test at least 95% of the various individual student groups, including students with disabilities and those with Limited English Proficiency. Accommodations may include reading tests to students or allowing extra time to interpret tests. In the future, the Department will offer native language versions of the assessments for limited English proficient groups numbering 5000 or more; and

3. One additional performance measure depending on grade span:

   a. Elementary/middle schools must have 90% average student attendance or show an attendance rate improvement over the prior year.

   b. High schools must have an 80% graduation rate or show improvement in the graduation rate from the prior year. To graduate, students must demonstrate proficiency in reading, writing and math. To measure such proficiency, a school entity may use either: 1) proficient or better performance on the PSSA administered in grade 11 or 12; or 2) proficient or better performance on a local assessment aligned with the academic standards and the PSSA. Local assessments may be a single exam or a combination of assessment strategies, but proficiency is expected to be comparable with proficiency on the PSSA.[vi]

   c. Districts must meet, or show growth in, both the attendance and graduation rate targets across all schools in their jurisdictions.

The three criteria listed above apply not only to the school or district as a whole, but also to the performance of subgroups, including racial/ethnic categories, low-income students, students with disabilities, and English Language Learners.

Table 2: AYP Requirements for Student Performance on Reading and Math PSSA [vii]

Year	2002-04	2005-07	2008-10	2011	2012	2013	2014
Percent Proficient in Reading	45	54	63	72	81	91	100
Percent Proficient in Math	35	45	56	67	78	89	100

As Table 2 shows, the Commonwealth requires that, by 2014, all its students must reach the proficient level or above in reading and math. Between now and 2014, the state has established an escalating series of intermediate performance goals designed to prompt schools and districts to move toward the ultimate goal of 100% proficiency. Schools must meet or exceed these intermediate yearly goals to make AYP each year.

Pennsylvania has also established a series of consequences for failing to reach the AYP goals shown in Table 2. These consequences apply to both schools and districts. In the first year of not meeting AYP, a school or district is placed in "warning" status. Warning means that the school fell short of the AYP targets but has another year to achieve them. These schools are not subject to consequences. Instead, they are required to examine, and where necessary modify, their improvement strategies so they will meet targets next year. If a school does not meet its AYP for two consecutive years, it is designated as needing improvement and is placed in one of the categories described in Table 3.[viii] A school or district can exit School Improvement or Corrective Action status by meeting AYP targets for two consecutive years.

Table 3: Consequences for Failing to Make AYP
School Improvement I — AYP failure for 2 consecutive years. If a school does not meet its AYP for two years in a row, students will be eligible for school choice, school officials will develop an improvement plan to turn around the school, and the school will receive technical assistance to help it get back on the right track. The school choice provision means that the school/district is required to offer parents the option of sending their child to another public school (including charter schools) within the school district. If no other school within the district is available, a district must, to the extent practical, enter into a cooperative agreement with another district that will allow students to transfer.
School Improvement II — AYP failure for 3 consecutive years. If a school or district does not meet its AYP for three years in a row, it must continue to offer public school choice and plan improvements. Additionally, the school or district will need to offer supplemental education services such as tutoring, after-school, or summer school support. The district will be responsible for paying for these additional services.
Corrective Action I — AYP failure for 4 consecutive years. A school or district is categorized in Corrective Action I when it does not meet its AYP for four consecutive years. At this level, schools are eligible for various levels of technical assistance and are subject to escalating consequences (e.g., changes in curriculum, leadership, professional development).
Corrective Action II — AYP failure for 5 consecutive years. If a school or district does not meet its AYP for five years in a row, it is subject to governance changes such as reconstitution, chartering, and privatization. In the meantime, improvement plans, school choice, and supplemental education services are still required.

[i] Source: Pennsylvania Department of Education. Retrieved January 5, 2007 from the World Wide Web. http://www.pde.state.pa.us/a_and_t/site/default.asp

[ii] Source: Pennsylvania Department of Education. Retrieved January 5, 2007 from the World Wide Web. http://www.pde.state.pa.us/pas/cwp/view.asp?a=3&Q=94580&pasNav=|6132|&pasNav=|6325|

[iii] Source: Pennsylvania Department of Education. Retrieved January 5, 2007 from the World Wide Web. http://www.pde.state.pa.us/a_and_t/site/default.asp

[iv] Source: Pennsylvania Department of Education. Retrieved January 8, 2007 from the World Wide Web. http://www.pde.state.pa.us/stateboard_ed/cwp/view.asp?a=3&Q=76716

[v] Pennsylvania Consolidated State Application Accountability Workbook, (Revised May 30, 2006), page 55. http://www.pde.state.pa.us/nclb/lib/nclb/Accountability_Workbook_revised_2006.pdf|

[vi] Source: Pennsylvania Department of Education. Retrieved January 8, 2007 from the World Wide Web. http://www.pde.state.pa.us/k12/cwp/view.asp?A=11&Q=85767; http://www.pde.state.pa.us/k12/cwp/view.asp?a=85&Q=74007

[vii] Source: Pennsylvania Department of Education. Retrieved January 5, 2007 from the World Wide Web. http://www.pde.state.pa.us/pas/cwp/view.asp?a=3&Q=94580&pasNav=|6132|&pasNav=|6325|

[viii] Id.

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APPENDIX E

Geographic Cost of Living Index

COUNTY	LCM
Adams	0.96
Allegheny	1.00
Beaver	1.00
Bedford	0.94
Berks	1.03
Blair	0.96
Bucks	1.13
Butler	1.00
Cambria	0.93
Cameron	0.93
Carbon	1.06
Centre	1.00
Chester	1.13
Clarion	0.93
Clearfield	0.93
Clinton	0.97
Columbia	0.97
Crawford	0.94
Cumberland	1.04
Dauphin	1.04
Delaware	1.13
Elk	0.93
Erie	0.97
Fayette	1.00
Forest	0.93
Franklin	0.96
Fulton	0.93
Greene	0.95
Huntingdon	0.94
Indiana	0.94
Jefferson	0.93
Juniata	0.96
Lackawanna	0.98

COUNTY	LCM
Lancaster	1.01
Lawrence	0.97
Lebanon	0.99
Lehigh	1.06
Luzerne	0.98
Lycoming	0.97
McKean	0.93
Mercer	0.98
Mifflin	0.96
Monroe	1.00
Montgomery	1.13
Montour	0.98
Northampton	1.06
Northumberland	0.97
Perry	1.04
Philadelphia	1.13
Pike	1.16
Potter	0.93
Schuylkill	0.94
Snyder	0.97
Somerset	0.93
Sullivan	0.93
Susquehanna	0.93
Tioga	0.93
Union	0.97
Venango	0.93
Warren	0.94
Washington	1.00
Wayne	0.95
Westmoreland	1.00
Wyoming	0.98
York	1.00

Comparing Actual Spending With Costing Out Estimates

AUN	School District	County	2005-06 ADM	Comparison Spending per Pupil	Costing Out Estimate per Pupil	Total Difference per Pupil
112011103	Bermudian Springs SD	Adams	2,214	$7,076	$10,480	-$3,404
112011603	Conewago Valley SD	Adams	3,810	$7,447	$10,725	-$3,278
112013054	Fairfield Area SD	Adams	1,302	$8,216	$10,164	-$1,948
112013753	Gettysburg Area SD	Adams	3,383	$9,850	$11,413	-$1,563
112015203	Littlestown Area SD	Adams	2,391	$7,963	$10,641	-$2,678
112018523	Upper Adams SD	Adams	1,868	$8,372	$12,960	-$4,588
103020603	Allegheny Valley SD	Allegheny	1,206	$11,898	$11,681	$217
103020753	Avonworth SD	Allegheny	1,338	$10,501	$11,044	-$543
103021102	Baldwin-Whitehall SD	Allegheny	4,446	$9,682	$11,567	-$1,885
103021252	Bethel Park SD	Allegheny	5,082	$9,957	$10,458	-$501
103021453	Brentwood Borough SD	Allegheny	1,365	$9,864	$11,598	-$1,734
103021603	Carlynton SD	Allegheny	1,582	$11,011	$11,879	-$867
103021752	Chartiers Valley SD	Allegheny	3,504	$9,244	$10,630	-$1,387
103021903	Clairton City SD	Allegheny	989	$12,155	$14,977	-$2,822
103022103	Cornell SD	Allegheny	738	$10,935	$13,729	-$2,795
103022253	Deer Lakes SD	Allegheny	2,095	$10,438	$11,269	-$831
103022503	Duquesne City SD	Allegheny	903	$13,654	$13,639	$15
103022803	East Allegheny SD	Allegheny	2,003	$9,963	$12,055	-$2,092
103023153	Elizabeth Forward SD	Allegheny	2,916	$9,071	$11,139	-$2,069
103023912	Fox Chapel Area SD	Allegheny	4,650	$11,996	$10,825	$1,171
103024102	Gateway SD	Allegheny	4,361	$11,209	$11,539	-$330
103024603	Hampton Twp SD	Allegheny	3,141	$9,294	$10,542	-$1,248
103024753	Highlands SD	Allegheny	2,865	$9,811	$12,575	-$2,764
103025002	Keystone Oaks SD	Allegheny	2,438	$11,018	$11,328	-$309
103026002	Mckeesport Area SD	Allegheny	4,599	$9,621	$12,472	-$2,851
103026303	Montour SD	Allegheny	3,239	$11,030	$10,984	$47
103026343	Moon Area SD	Allegheny	3,843	$9,915	$10,528	-$613
103026402	Mt Lebanon SD	Allegheny	5,447	$10,648	$10,092	$556
103026852	North Allegheny SD	Allegheny	8,093	$10,754	$9,981	$773
103026902	North Hills SD	Allegheny	4,801	$10,442	$10,886	-$443
103026873	Northgate SD	Allegheny	1,468	$10,046	$12,303	-$2,257
103027352	Penn Hills SD	Allegheny	5,719	$10,341	$11,709	-$1,368
103021003	Pine-Richland SD	Allegheny	4,236	$8,785	$9,826	-$1,041
102027451	Pittsburgh SD	Allegheny	32,556	$15,078	$12,747	$2,330
103027503	Plum Borough SD	Allegheny	4,443	$8,677	$10,082	-$1,405
103027753	Quaker Valley SD	Allegheny	1,910	$12,488	$10,902	$1,586
103028203	Riverview SD	Allegheny	1,224	$10,773	$12,001	-$1,228
103028302	Shaler Area SD	Allegheny	5,525	$9,492	$11,432	-$1,940
103028653	South Allegheny SD	Allegheny	1,776	$8,046	$12,354	-$4,307
103028703	South Fayette Twp SD	Allegheny	2,018	$9,814	$10,040	-$226
103028753	South Park SD	Allegheny	2,257	$9,098	$10,636	-$1,537
103028833	Steel Valley SD	Allegheny	2,297	$10,454	$11,958	-$1,504
103028853	Sto-Rox SD	Allegheny	1,551	$11,164	$13,616	-$2,452
103029203	Upper Saint Clair SD	Allegheny	4,143	$10,620	$10,509	$112
103029403	West Allegheny SD	Allegheny	3,308	$9,646	$10,815	-$1,168
103029553	West Jefferson Hills SD	Allegheny	2,905	$9,492	$10,584	-$1,091
103029603	West Mifflin Area SD	Allegheny	3,303	$9,546	$11,182	-$1,635
103029803	Wilkinsburg Borough SD	Allegheny	1,771	$13,612	$14,042	-$430
103029902	Woodland Hills SD	Allegheny	5,690	$11,404	$12,493	-$1,089

AUN	School District	County	2005-06 ADM	Comparison Spending per Pupil	Costing Out Estimate per Pupil	Total Difference per Pupil
128030603	Apollo-Ridge SD	Armstrong	1,620	$9,426	$11,794	-$2,367
128030852	Armstrong SD	Armstrong	6,509	$10,094	$11,325	-$1,231
128033053	Freeport Area SD	Armstrong	2,043	$8,356	$10,416	-$2,060
128034503	Leechburg Area SD	Armstrong	898	$10,806	$12,189	-$1,382
127040503	Aliquippa SD	Beaver	1,380	$12,213	$13,956	-$1,742
127040703	Ambridge Area SD	Beaver	3,070	$8,910	$11,560	-$2,650
127041203	Beaver Area SD	Beaver	2,128	$8,127	$10,325	-$2,198
127041503	Big Beaver Falls Area SD	Beaver	1,928	$9,904	$12,474	-$2,570
127041603	Blackhawk SD	Beaver	2,817	$8,511	$10,254	-$1,743
127041903	Center Area SD	Beaver	1,959	$8,262	$10,389	-$2,126
127042853	Freedom Area SD	Beaver	1,729	$8,186	$11,852	-$3,665
127044103	Hopewell Area SD	Beaver	2,795	$8,505	$11,055	-$2,549
127045303	Midland Borough SD	Beaver	433	$9,450	$12,684	-$3,234
127045453	Monaca SD	Beaver	794	$9,187	$12,647	-$3,460
127045653	New Brighton Area SD	Beaver	1,906	$8,133	$11,856	-$3,723
127045853	Riverside Beaver County SD	Beaver	1,831	$8,621	$11,736	-$3,115
127046903	Rochester Area SD	Beaver	1,095	$10,017	$12,929	-$2,912
127047404	South Side Area SD	Beaver	1,342	$10,935	$11,744	-$809
127049303	Western Beaver County SD	Beaver	913	$9,603	$12,486	-$2,883
108051003	Bedford Area SD	Bedford	2,378	$7,888	$11,103	-$3,215
108051503	Chestnut Ridge SD	Bedford	1,787	$7,585	$11,450	-$3,865
108053003	Everett Area SD	Bedford	1,557	$8,355	$11,628	-$3,273
108056004	Northern Bedford County SD	Bedford	1,149	$7,955	$11,027	-$3,072
108058003	Tussey Mountain SD	Bedford	1,228	$9,136	$11,942	-$2,805
114060503	Antietam SD	Berks	1,112	$8,906	$12,707	-$3,801
114060753	Boyertown Area SD	Berks	7,082	$8,586	$10,606	-$2,020
114060853	Brandywine Heights Area SD	Berks	1,986	$9,356	$11,870	-$2,514
114061103	Conrad Weiser Area SD	Berks	2,976	$8,801	$11,474	-$2,673
114061503	Daniel Boone Area SD	Berks	3,810	$8,220	$10,618	-$2,398
114062003	Exeter Twp SD	Berks	4,332	$8,775	$10,936	-$2,160
114062503	Fleetwood Area SD	Berks	2,710	$8,316	$11,093	-$2,777
114063003	Governor Mifflin SD	Berks	4,297	$8,538	$10,879	-$2,341
114063503	Hamburg Area SD	Berks	2,715	$8,299	$11,304	-$3,004
114064003	Kutztown Area SD	Berks	1,760	$10,819	$12,296	-$1,477
114065503	Muhlenberg SD	Berks	3,309	$9,080	$11,824	-$2,744
114066503	Oley Valley SD	Berks	2,098	$9,034	$11,152	-$2,119
114067002	Reading SD	Berks	17,841	$7,458	$13,896	-$6,437
114067503	Schuylkill Valley SD	Berks	2,033	$10,254	$11,108	-$854
114068003	Tulpehocken Area SD	Berks	1,738	$10,306	$12,695	-$2,389
114068103	Twin Valley SD	Berks	3,384	$9,313	$10,934	-$1,621
114069103	Wilson SD	Berks	5,610	$8,552	$11,026	-$2,474
114069353	Wyomissing Area SD	Berks	1,919	$10,070	$11,627	-$1,557
108070502	Altoona Area SD	Blair	8,359	$8,185	$11,604	-$3,419
108071003	Bellwood-Antis SD	Blair	1,358	$8,553	$10,658	-$2,104
108071504	Claysburg-Kimmel SD	Blair	930	$8,134	$12,254	-$4,120
108073503	Hollidaysburg Area SD	Blair	3,713	$8,765	$10,658	-$1,892
108077503	Spring Cove SD	Blair	1,992	$8,214	$11,414	-$3,200
108078003	Tyrone Area SD	Blair	1,925	$8,079	$11,832	-$3,753
108079004	Williamsburg Comm SD	Blair	573	$9,498	$12,627	-$3,130

AUN	School District	County	2005-06 ADM	Comparison Spending per Pupil	Costing Out Estimate per Pupil	Total Difference per Pupil
117080503	Athens Area SD	Bradford	2,456	$8,858	$11,152	-$2,293
117081003	Canton Area SD	Bradford	1,139	$9,506	$11,397	-$1,892
117083004	Northeast Bradford SD	Bradford	924	$9,674	$11,143	-$1,469
117086003	Sayre Area SD	Bradford	1,212	$9,720	$11,162	-$1,442
117086503	Towanda Area SD	Bradford	1,765	$8,903	$11,071	-$2,169
117086653	Troy Area SD	Bradford	1,746	$8,311	$11,723	-$3,412
117089003	Wyalusing Area SD	Bradford	1,474	$8,881	$10,773	-$1,892
122091002	Bensalem Twp SD	Bucks	6,803	$12,331	$12,905	-$574
122091303	Bristol Borough SD	Bucks	1,303	$11,328	$15,464	-$4,136
122091352	Bristol Twp SD	Bucks	7,351	$11,949	$14,044	-$2,096
122092002	Centennial SD	Bucks	6,305	$10,400	$13,038	-$2,638
122092102	Central Bucks SD	Bucks	20,164	$8,915	$10,400	-$1,486
122092353	Council Rock SD	Bucks	12,771	$11,259	$11,448	-$189
122097203	Morrisville Borough SD	Bucks	968	$15,141	$15,198	-$57
122097502	Neshaminy SD	Bucks	9,773	$13,270	$12,208	$1,062
122097604	New Hope-Solebury SD	Bucks	1,494	$14,040	$12,136	$1,904
122098003	Palisades SD	Bucks	2,157	$11,590	$12,514	-$924
122098103	Pennridge SD	Bucks	7,338	$9,772	$11,686	-$1,914
122098202	Pennsbury SD	Bucks	11,938	$10,892	$11,172	-$281
122098403	Quakertown Comm SD	Bucks	5,558	$11,355	$11,714	-$359
104101252	Butler Area SD	Butler	8,438	$7,678	$10,832	-$3,155
104103603	Karns City Area SD	Butler	1,858	$8,652	$11,514	-$2,861
104105003	Mars Area SD	Butler	2,986	$7,476	$9,489	-$2,013
104105353	Moniteau SD	Butler	1,859	$6,883	$11,249	-$4,366
104107903	Seneca Valley SD	Butler	7,761	$8,107	$10,271	-$2,163
104107503	Slippery Rock Area SD	Butler	2,503	$7,636	$11,331	-$3,695
104107803	South Butler County SD	Butler	2,908	$7,360	$10,485	-$3,125
108110603	Blacklick Valley SD	Cambria	701	$10,102	$12,375	-$2,273
108111203	Cambria Heights SD	Cambria	1,516	$9,430	$11,335	-$1,905
108111303	Central Cambria SD	Cambria	1,894	$8,350	$10,986	-$2,636
108111403	Conemaugh Valley SD	Cambria	955	$8,728	$11,571	-$2,842
108112003	Ferndale Area SD	Cambria	840	$8,841	$11,856	-$3,015
108112203	Forest Hills SD	Cambria	2,290	$8,049	$10,711	-$2,661
108112502	Greater Johnstown SD	Cambria	3,268	$9,253	$12,240	-$2,986
108114503	Northern Cambria SD	Cambria	1,267	$10,008	$11,572	-$1,564
108116003	Penn Cambria SD	Cambria	1,799	$8,789	$11,085	-$2,296
108116303	Portage Area SD	Cambria	1,014	$9,139	$11,609	-$2,470
108116503	Richland SD	Cambria	1,621	$8,871	$9,721	-$850
108118503	Westmont Hilltop SD	Cambria	1,777	$8,153	$9,858	-$1,704
109122703	Cameron County SD	Cameron	905	$9,178	$11,745	-$2,567
121135003	Jim Thorpe Area SD	Carbon	2,119	$9,252	$12,610	-$3,357
121135503	Lehighton Area SD	Carbon	2,590	$9,360	$11,970	-$2,610
121136503	Palmerton Area SD	Carbon	2,072	$8,812	$12,099	-$3,286
121136603	Panther Valley SD	Carbon	1,735	$8,937	$13,427	-$4,490
121139004	Weatherly Area SD	Carbon	794	$10,072	$12,871	-$2,799
110141003	Bald Eagle Area SD	Centre	2,055	$8,992	$11,530	-$2,539
110141103	Bellefonte Area SD	Centre	3,030	$9,110	$11,650	-$2,540
110147003	Penns Valley Area SD	Centre	1,670	$9,281	$11,387	-$2,106
110148002	State College Area SD	Centre	7,525	$10,442	$10,277	$165
124150503	Avon Grove SD	Chester	5,824	$7,744	$11,931	-$4,187
124151902	Coatesville Area SD	Chester	8,475	$11,204	$12,609	-$1,405

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124152003	Downingtown Area SD	Chester	11,778	$9,338	$11,061	-$1,723
124153503	Great Valley SD	Chester	4,033	$11,742	$12,075	-$333
124154003	Kennett Consolidated SD	Chester	4,301	$10,080	$14,075	-$3,995
124156503	Octorara Area SD	Chester	2,779	$10,470	$13,016	-$2,546
124156603	Owen J Roberts SD	Chester	4,716	$10,240	$11,603	-$1,363
124156703	Oxford Area SD	Chester	3,902	$8,632	$13,746	-$5,115
124157203	Phoenixville Area SD	Chester	3,819	$12,985	$12,363	$622
124157802	Tredyffrin-Easttown SD	Chester	5,969	$12,658	$11,575	$1,082
124158503	Unionville-Chadds Ford SD	Chester	4,059	$11,094	$11,599	-$505
124159002	West Chester Area SD	Chester	12,244	$10,761	$11,393	-$632
106160303	Allegheny-Clarion Valley SD	Clarion	973	$9,333	$11,869	-$2,536
106161203	Clarion Area SD	Clarion	937	$9,265	$10,434	-$1,169
106161703	Clarion-Limestone Area SD	Clarion	1,099	$8,740	$11,035	-$2,295
106166503	Keystone SD	Clarion	1,205	$9,184	$11,472	-$2,288
106167504	North Clarion County SD	Clarion	684	$8,916	$11,668	-$2,752
106168003	Redbank Valley SD	Clarion	1,366	$8,573	$11,175	-$2,602
106169003	Union SD	Clarion	779	$9,542	$11,715	-$2,173
110171003	Clearfield Area SD	Clearfield	2,868	$8,691	$11,556	-$2,865
110171803	Curwensville Area SD	Clearfield	1,238	$8,707	$11,247	-$2,540
106172003	Dubois Area SD	Clearfield	4,523	$7,973	$10,534	-$2,562
110173003	Glendale SD	Clearfield	888	$10,381	$12,246	-$1,865
110173504	Harmony Area SD	Clearfield	365	$12,029	$12,486	-$457
110175003	Moshannon Valley SD	Clearfield	1,106	$8,662	$10,956	-$2,295
110177003	Philipsburg-Osceola Area SD	Clearfield	2,118	$10,592	$11,400	-$808
110179003	West Branch Area SD	Clearfield	1,322	$8,533	$11,605	-$3,072
110183602	Keystone Central SD	Clinton	4,714	$10,116	$11,588	-$1,471
116191004	Benton Area SD	Columbia	822	$8,781	$11,694	-$2,913
116191103	Berwick Area SD	Columbia	3,507	$8,707	$11,931	-$3,223
116191203	Bloomsburg Area SD	Columbia	1,888	$8,381	$11,807	-$3,426
116191503	Central Columbia SD	Columbia	2,250	$7,738	$10,523	-$2,785
116195004	Millville Area SD	Columbia	806	$10,028	$12,062	-$2,034
116197503	Southern Columbia Area SD	Columbia	1,517	$7,777	$11,071	-$3,294
105201033	Conneaut SD	Crawford	2,779	$8,526	$11,161	-$2,635
105201352	Crawford Central SD	Crawford	4,153	$9,854	$11,234	-$1,380
105204703	Penncrest SD	Crawford	3,991	$8,682	$10,760	-$2,078
115210503	Big Spring SD	Cumberland	3,125	$8,555	$11,786	-$3,232
115211003	Camp Hill SD	Cumberland	1,159	$9,582	$11,307	-$1,725
115211103	Carlisle Area SD	Cumberland	4,846	$8,805	$11,539	-$2,734
115211603	Cumberland Valley SD	Cumberland	7,781	$7,639	$10,567	-$2,928
115212503	East Pennsboro Area SD	Cumberland	2,882	$8,249	$11,542	-$3,292
115216503	Mechanicsburg Area SD	Cumberland	3,634	$8,903	$11,242	-$2,339
115218003	Shippensburg Area SD	Cumberland	3,425	$7,596	$11,464	-$3,868
115218303	South Middleton SD	Cumberland	2,267	$8,257	$11,069	-$2,812
115221402	Central Dauphin SD	Dauphin	11,746	$8,509	$11,205	-$2,695
115221753	Derry Twp SD	Dauphin	3,556	$9,469	$10,597	-$1,128
115222504	Halifax Area SD	Dauphin	1,259	$10,121	$11,705	-$1,584
115222752	Harrisburg City SD	Dauphin	8,298	$13,118	$14,638	-$1,520
115224003	Lower Dauphin SD	Dauphin	4,104	$8,614	$11,327	-$2,713
115226003	Middletown Area SD	Dauphin	2,588	$9,886	$12,208	-$2,321
115226103	Millersburg Area SD	Dauphin	957	$9,590	$11,695	-$2,106
115228003	Steelton-Highspire SD	Dauphin	1,401	$10,252	$13,522	-$3,270

Appendix F continued

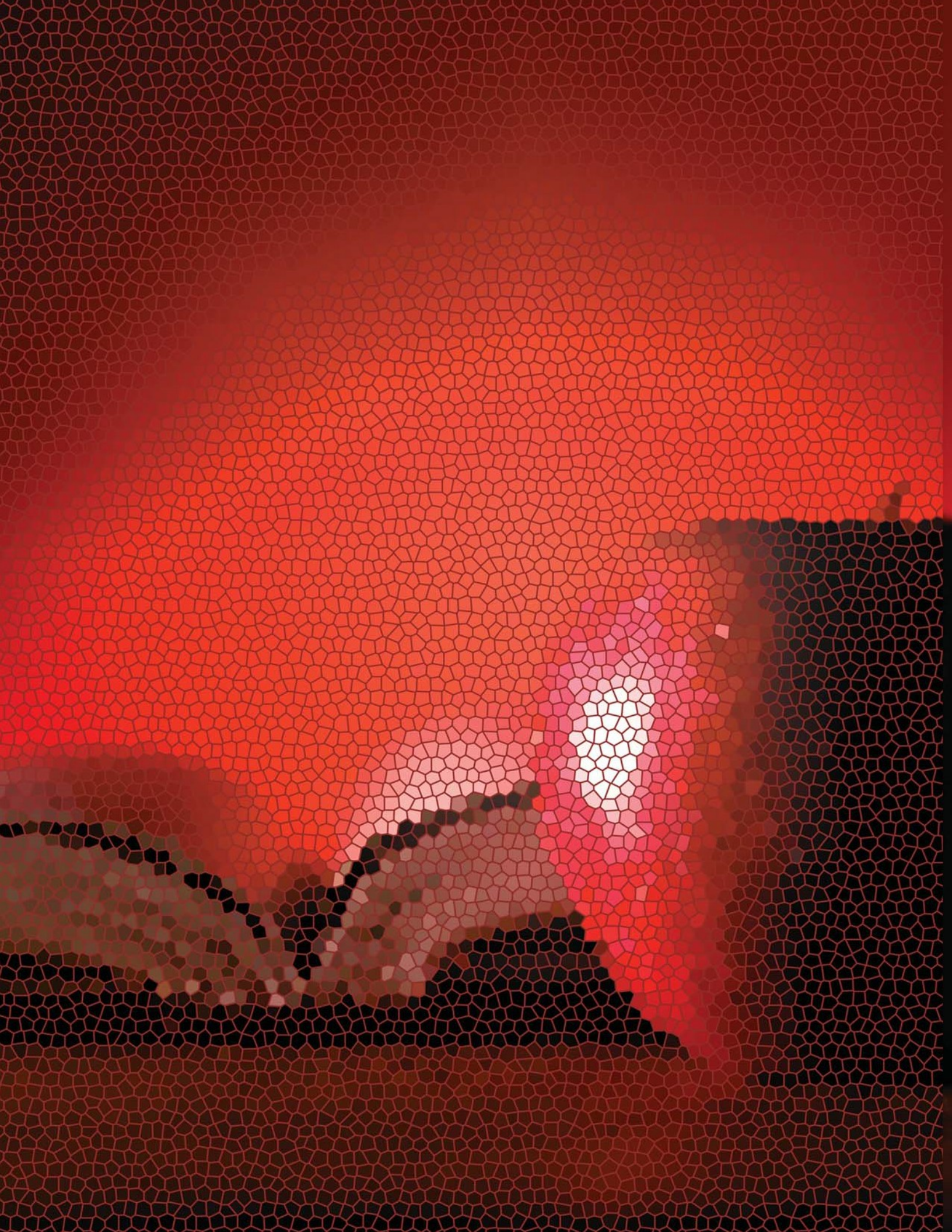
AUN	School District	County	2005-06 ADM	Comparison Spending per Pupil	Costing Out Estimate per Pupil	Total Difference per Pupil
115228303	Susquehanna Twp SD	Dauphin	3,243	$8,744	$11,898	-$3,153
115229003	Upper Dauphin Area SD	Dauphin	1,327	$9,495	$11,319	-$1,824
125231232	Chester-Upland SD	Delaware	7,281	$10,563	$13,459	-$2,897
125231303	Chichester SD	Delaware	3,650	$11,045	$13,743	-$2,698
125234103	Garnet Valley SD	Delaware	4,431	$10,718	$12,123	-$1,405
125234502	Haverford Twp SD	Delaware	5,661	$10,248	$12,326	-$2,078
125235103	Interboro SD	Delaware	3,959	$10,186	$12,948	-$2,762
125235502	Marple Newtown SD	Delaware	3,562	$12,536	$12,405	$131
125236903	Penn-Delco SD	Delaware	3,380	$9,930	$12,134	-$2,204
125237603	Radnor Twp SD	Delaware	3,579	$14,475	$12,427	$2,048
125237702	Ridley SD	Delaware	5,919	$10,051	$12,723	-$2,672
125237903	Rose Tree Media SD	Delaware	4,000	$12,884	$12,442	$442
125238402	Southeast Delco SD	Delaware	4,153	$9,729	$14,572	-$4,843
125238502	Springfield SD	Delaware	3,444	$11,295	$12,006	-$710
125239452	Upper Darby SD	Delaware	12,289	$8,671	$13,058	-$4,388
125239603	Wallingford-Swarthmore SD	Delaware	3,574	$12,359	$12,345	$14
125239652	William Penn SD	Delaware	5,705	$10,697	$14,096	-$3,399
109243503	Johnsonburg Area SD	Elk	724	$10,341	$11,872	-$1,531
109246003	Ridgway Area SD	Elk	1,033	$9,889	$11,184	-$1,294
109248003	Saint Marys Area SD	Elk	2,528	$7,434	$10,579	-$3,145
105251453	Corry Area SD	Erie	2,467	$8,804	$12,475	-$3,671
105252602	Erie City SD	Erie	13,587	$9,373	$13,105	-$3,731
105253303	Fairview SD	Erie	1,646	$8,815	$10,359	-$1,544
105253553	Fort Leboeuf SD	Erie	2,280	$7,371	$11,681	-$4,310
105253903	General Mclane SD	Erie	2,397	$7,573	$10,917	-$3,344
105254053	Girard SD	Erie	2,076	$7,419	$11,521	-$4,102
105254353	Harbor Creek SD	Erie	2,163	$8,698	$10,638	-$1,940
105256553	Iroquois SD	Erie	1,257	$8,266	$12,331	-$4,065
105257602	Millcreek Twp SD	Erie	7,487	$8,010	$10,207	-$2,197
105258303	North East SD	Erie	1,929	$8,125	$11,257	-$3,132
105258503	Northwestern SD	Erie	1,858	$6,805	$11,808	-$5,003
105259103	Union City Area SD	Erie	1,364	$9,056	$12,544	-$3,488
105259703	Wattsburg Area SD	Erie	1,676	$7,935	$11,116	-$3,181
101260303	Albert Gallatin Area SD	Fayette	3,976	$8,904	$12,748	-$3,844
101260803	Brownsville Area SD	Fayette	2,035	$9,884	$12,583	-$2,699
101261302	Connellsville Area SD	Fayette	5,753	$8,219	$12,186	-$3,966
101262903	Frazier SD	Fayette	1,177	$8,842	$11,942	-$3,100
101264003	Laurel Highlands SD	Fayette	3,625	$8,099	$11,777	-$3,678
101268003	Uniontown Area SD	Fayette	3,582	$8,315	$12,312	-$3,997
106272003	Forest Area SD	Forest	702	$12,332	$12,507	-$175
112281302	Chambersburg Area SD	Franklin	8,611	$8,042	$10,972	-$2,930
112282004	Fannett-Metal SD	Franklin	598	$9,284	$11,510	-$2,226
112283003	Greencastle-Antrim SD	Franklin	2,882	$7,391	$9,892	-$2,501
112286003	Tuscarora SD	Franklin	2,804	$8,086	$10,899	-$2,813
112289003	Waynesboro Area SD	Franklin	4,200	$8,377	$10,438	-$2,061
111291304	Central Fulton SD	Fulton	1,060	$8,610	$10,916	-$2,306
111292304	Forbes Road SD	Fulton	496	$9,664	$10,579	-$916
111297504	Southern Fulton SD	Fulton	914	$7,705	$11,119	-$3,414
101301303	Carmichaels Area SD	Greene	1,127	$9,610	$11,957	-$2,347
101301403	Central Greene SD	Greene	2,253	$9,166	$12,139	-$2,973
101303503	Jefferson-Morgan SD	Greene	914	$10,883	$11,968	-$1,085
101306503	Southeastern Greene SD	Greene	732	$10,193	$12,413	-$2,219
101308503	West Greene SD	Greene	925	$11,500	$13,266	-$1,766
111312503	Huntingdon Area SD	Huntingdon	2,366	$7,446	$11,528	-$4,082
111312804	Juniata Valley SD	Huntingdon	846	$8,998	$11,265	-$2,267
111316003	Mount Union Area SD	Huntingdon	1,570	$8,585	$11,666	-$3,081
111317503	Southern Huntingdon Co SD	Huntingdon	1,370	$7,919	$11,366	-$3,448
128321103	Blairsville-Saltsburg SD	Indiana	2,109	$9,652	$11,479	-$1,827
128323303	Homer-Center SD	Indiana	950	$10,619	$11,801	-$1,182
128323703	Indiana Area SD	Indiana	3,064	$11,136	$10,866	$269
128325203	Marion Center Area SD	Indiana	1,573	$10,099	$11,682	-$1,584
128326303	Penns Manor Area SD	Indiana	1,057	$9,267	$11,659	-$2,392
128327303	Purchase Line SD	Indiana	1,212	$10,078	$12,766	-$2,688
128328003	United SD	Indiana	1,256	$10,932	$11,430	-$498
106330703	Brockway Area SD	Jefferson	1,217	$8,336	$11,042	-$2,706
106330803	Brookville Area SD	Jefferson	1,894	$8,418	$11,299	-$2,881
106338003	Punxsutawney Area SD	Jefferson	2,802	$9,330	$11,331	-$2,002
111343603	Juniata County SD	Juniata	3,153	$7,769	$10,763	-$2,994
119350303	Abington Heights SD	Lackawanna	3,673	$8,512	$10,419	-$1,907
119351303	Carbondale Area SD	Lackawanna	1,663	$8,188	$11,965	-$3,777
119352203	Dunmore SD	Lackawanna	1,703	$7,286	$11,070	-$3,784
119354603	Lakeland SD	Lackawanna	1,669	$7,949	$10,940	-$2,991
119355503	Mid Valley SD	Lackawanna	1,663	$8,265	$11,805	-$3,540
119356503	North Pocono SD	Lackawanna	3,282	$8,315	$10,566	-$2,250
119356603	Old Forge SD	Lackawanna	949	$8,521	$11,582	-$3,061
119357003	Riverside SD	Lackawanna	1,582	$9,835	$11,494	-$1,658
119357402	Scranton SD	Lackawanna	9,440	$9,622	$12,054	-$2,432
119358403	Valley View SD	Lackawanna	2,614	$6,872	$10,685	-$3,813
113361303	Cocalico SD	Lancaster	3,670	$7,548	$11,088	-$3,540
113361503	Columbia Borough SD	Lancaster	1,532	$8,782	$13,599	-$4,818
113361703	Conestoga Valley SD	Lancaster	4,055	$8,283	$11,631	-$3,348
113362203	Donegal SD	Lancaster	2,826	$7,844	$11,402	-$3,558
113362303	Eastern Lancaster County SD	Lancaster	3,507	$8,294	$11,145	-$2,851
113362403	Elizabethtown Area SD	Lancaster	4,021	$7,473	$10,783	-$3,310
113362603	Ephrata Area SD	Lancaster	4,124	$8,731	$11,597	-$2,866
113363103	Hempfield SD	Lancaster	7,337	$8,401	$11,306	-$2,905
113363603	Lampeter-Strasburg SD	Lancaster	3,344	$7,972	$10,738	-$2,766
113364002	Lancaster SD	Lancaster	11,547	$9,878	$15,816	-$5,939
113364403	Manheim Central SD	Lancaster	3,119	$8,781	$11,454	-$2,672
113364503	Manheim Twp SD	Lancaster	5,621	$8,607	$10,805	-$2,197
113365203	Penn Manor SD	Lancaster	5,451	$7,776	$11,001	-$3,226
113365303	Pequea Valley SD	Lancaster	1,950	$8,699	$11,677	-$2,978
113367003	Solanco SD	Lancaster	4,050	$7,201	$10,728	-$3,527
113369003	Warwick SD	Lancaster	4,746	$7,973	$11,016	-$3,042
104372003	Ellwood City Area SD	Lawrence	2,251	$8,217	$11,117	-$2,899
104374003	Laurel SD	Lawrence	1,428	$8,390	$10,583	-$2,193
104375003	Mohawk Area SD	Lawrence	1,944	$7,696	$10,909	-$3,212
104375203	Neshannock Twp SD	Lawrence	1,366	$8,304	$10,004	-$1,701
104375302	New Castle Area SD	Lawrence	3,961	$8,914	$11,876	-$2,962
104376203	Shenango Area SD	Lawrence	1,424	$8,278	$10,768	-$2,490
104377003	Union Area SD	Lawrence	903	$8,835	$11,757	-$2,922
104378003	Wilmington Area SD	Lawrence	1,573	$7,566	$11,647	-$4,081

Appendix F continued

AUN	School District	County	2005-06 ADM	Comparison Spending per Pupil	Costing Out Estimate per Pupil	Total Difference per Pupil
113380303	Annville-Cleona SD	Lebanon	1,691	$8,072	$11,081	-$3,009
113381303	Cornwall-Lebanon SD	Lebanon	4,896	$8,049	$10,684	-$2,635
113382303	Eastern Lebanon County SD	Lebanon	2,452	$8,185	$10,757	-$2,572
113384603	Lebanon SD	Lebanon	4,452	$8,713	$13,753	-$5,040
113385003	Northern Lebanon SD	Lebanon	2,587	$7,971	$10,958	-$2,987
113385303	Palmyra Area SD	Lebanon	3,066	$7,215	$10,455	-$3,240
121390302	Allentown City SD	Lehigh	18,129	$8,291	$13,917	-$5,625
121391303	Catasauqua Area SD	Lehigh	1,705	$10,864	$12,698	-$1,834
121392303	East Penn SD	Lehigh	7,921	$8,431	$10,462	-$2,031
121394503	Northern Lehigh SD	Lehigh	2,045	$9,619	$12,516	-$2,897
121394603	Northwestern Lehigh SD	Lehigh	2,376	$9,995	$11,456	-$1,460
121395103	Parkland SD	Lehigh	9,087	$9,312	$10,740	-$1,428
121395603	Salisbury Twp SD	Lehigh	1,891	$12,346	$13,029	-$682
121395703	Southern Lehigh SD	Lehigh	3,108	$9,464	$11,113	-$1,649
121397803	Whitehall-Coplay SD	Lehigh	4,262	$7,808	$11,956	-$4,148
118401403	Crestwood SD	Luzerne	3,112	$7,345	$10,539	-$3,194
118401603	Dallas SD	Luzerne	2,763	$7,876	$10,377	-$2,501
118402603	Greater Nanticoke Area SD	Luzerne	2,251	$7,554	$12,025	-$4,472
118403003	Hanover Area SD	Luzerne	2,073	$9,327	$12,872	-$3,545
118403302	Hazleton Area SD	Luzerne	9,783	$7,499	$11,575	-$4,076
118403903	Lake-Lehman SD	Luzerne	2,210	$8,639	$10,880	-$2,241
118406003	Northwest Area SD	Luzerne	1,479	$9,024	$11,603	-$2,579
118406602	Pittston Area SD	Luzerne	3,258	$8,924	$10,859	-$1,935
118408852	Wilkes-Barre Area SD	Luzerne	7,444	$9,590	$11,832	-$2,242
118409203	Wyoming Area SD	Luzerne	2,659	$7,769	$11,072	-$3,303
118409302	Wyoming Valley West SD	Luzerne	5,518	$8,482	$11,132	-$2,650
117412003	East Lycoming SD	Lycoming	1,725	$8,192	$10,871	-$2,679
117414003	Jersey Shore Area SD	Lycoming	2,937	$8,569	$11,242	-$2,673
117414203	Loyalsock Twp SD	Lycoming	1,437	$9,416	$10,863	-$1,447
117415004	Montgomery Area SD	Lycoming	951	$9,737	$11,834	-$2,097
117415103	Montoursville Area SD	Lycoming	2,147	$8,189	$10,118	-$1,929
117415303	Muncy SD	Lycoming	1,064	$9,706	$11,628	-$1,921
117416103	South Williamsport Area SD	Lycoming	1,445	$8,138	$11,199	-$3,061
117417202	Williamsport Area SD	Lycoming	5,953	$9,851	$12,267	-$2,415
109420803	Bradford Area SD	McKean	2,910	$9,456	$10,900	-$1,444
109422303	Kane Area SD	McKean	1,318	$9,200	$11,003	-$1,803
109426003	Otto-Eldred SD	McKean	807	$8,927	$11,708	-$2,781
109426303	Port Allegany SD	McKean	1,111	$8,281	$11,214	-$2,933
109427503	Smethport Area SD	McKean	1,000	$9,565	$11,096	-$1,531
104431304	Commodore Perry SD	Mercer	673	$9,000	$11,691	-$2,690
104432503	Farrell Area SD	Mercer	1,027	$13,466	$13,817	-$350
104432803	Greenville Area SD	Mercer	1,689	$7,732	$11,439	-$3,707
104432903	Grove City Area SD	Mercer	2,408	$9,505	$10,793	-$1,288
104433303	Hermitage SD	Mercer	2,237	$8,481	$11,157	-$2,677
104433604	Jamestown Area SD	Mercer	664	$8,888	$12,563	-$3,675
104433903	Lakeview SD	Mercer	1,344	$7,999	$11,745	-$3,746
104435003	Mercer Area SD	Mercer	1,495	$7,708	$11,482	-$3,775
104435303	Reynolds SD	Mercer	1,514	$8,906	$11,913	-$3,007
104435603	Sharon City SD	Mercer	2,349	$9,199	$13,158	-$3,959
104435703	Sharpsville Area SD	Mercer	1,411	$7,494	$10,750	-$3,255
104437503	West Middlesex Area SD	Mercer	1,234	$8,099	$11,424	-$3,325
111444602	Mifflin County SD	Mifflin	5,961	$7,461	$10,931	-$3,471
120452003	East Stroudsburg Area SD	Monroe	8,220	$9,869	$11,438	-$1,570
120455203	Pleasant Valley SD	Monroe	7,227	$8,004	$10,390	-$2,387
120455403	Pocono Mountain SD	Monroe	12,216	$9,476	$11,507	-$2,031
120456003	Stroudsburg Area SD	Monroe	6,050	$10,071	$10,524	-$452
123460302	Abington SD	Montgomery	7,572	$11,857	$11,761	$96
123460504	Bryn Athyn SD	Montgomery	16	$18,793	$16,081	$2,712
123461302	Cheltenham Twp SD	Montgomery	4,712	$13,662	$11,986	$1,675
123461602	Colonial SD	Montgomery	4,684	$13,294	$12,309	$985
123463603	Hatboro-Horsham SD	Montgomery	5,493	$11,314	$11,494	-$180
123463803	Jenkintown SD	Montgomery	597	$16,203	$13,411	$2,792
123464502	Lower Merion SD	Montgomery	6,927	$17,184	$12,211	$4,972
123464603	Lower Moreland Twp SD	Montgomery	1,966	$11,872	$12,003	-$131
123465303	Methacton SD	Montgomery	5,614	$10,227	$11,226	-$998
123465602	Norristown Area SD	Montgomery	7,212	$12,817	$15,088	-$2,270
123465702	North Penn SD	Montgomery	13,012	$10,713	$12,057	-$1,345
123466103	Perkiomen Valley SD	Montgomery	5,388	$10,631	$11,138	-$507
123466303	Pottsgrove SD	Montgomery	3,322	$10,318	$12,165	-$1,848
123466403	Pottstown SD	Montgomery	3,343	$10,866	$14,256	-$3,390
123467103	Souderton Area SD	Montgomery	6,923	$9,785	$11,803	-$2,018
123467203	Springfield Twp SD	Montgomery	2,128	$13,970	$12,991	$979
123467303	Spring-Ford Area SD	Montgomery	7,245	$9,846	$11,285	-$1,439
123468303	Upper Dublin SD	Montgomery	4,471	$10,885	$11,717	-$833
123468402	Upper Merion Area SD	Montgomery	3,553	$14,423	$12,490	$1,933
123468503	Upper Moreland Twp SD	Montgomery	3,193	$10,700	$12,109	-$1,409
123468603	Upper Perkiomen SD	Montgomery	3,376	$9,673	$12,425	-$2,752
123469303	Wissahickon SD	Montgomery	4,680	$12,882	$12,515	$367
116471803	Danville Area SD	Montour	2,622	$9,348	$11,097	-$1,749
120480803	Bangor Area SD	Northampton	3,625	$8,503	$11,702	-$3,200
120481002	Bethlehem Area SD	Northampton	15,832	$8,702	$12,358	-$3,656
120483302	Easton Area SD	Northampton	8,976	$8,386	$11,739	-$3,353
120484803	Nazareth Area SD	Northampton	4,691	$8,114	$10,501	-$2,387
120484903	Northampton Area SD	Northampton	5,976	$8,652	$11,227	-$2,575
120485603	Pen Argyl Area SD	Northampton	1,977	$8,513	$11,649	-$3,136
120486003	Saucon Valley SD	Northampton	2,447	$11,454	$11,335	$119
120488603	Wilson Area SD	Northampton	2,269	$9,462	$12,116	-$2,654
116493503	Line Mountain SD	Northumberland	1,292	$9,322	$11,330	-$2,009
116495003	Milton Area SD	Northumberland	2,319	$8,823	$11,785	-$2,962
116495103	Mount Carmel Area SD	Northumberland	1,772	$7,230	$11,235	-$4,005
116496503	Shamokin Area SD	Northumberland	2,592	$8,671	$11,948	-$3,277
116496603	Shikellamy SD	Northumberland	3,227	$8,329	$10,783	-$2,454
116498003	Warrior Run SD	Northumberland	1,781	$8,129	$10,890	-$2,761
115503004	Greenwood SD	Perry	863	$8,119	$11,742	-$3,623
115504003	Newport SD	Perry	1,234	$9,371	$12,784	-$3,413
115506003	Susquenita SD	Perry	2,242	$9,172	$12,191	-$3,019
115508003	West Perry SD	Perry	2,927	$8,087	$11,796	-$3,709
126515001	Philadelphia City SD	Philadelphia	207,893	$9,947	$14,131	-$4,184
120522003	Delaware Valley SD	Pike	5,725	$8,270	$11,881	-$3,611
109530304	Austin Area SD	Potter	233	$12,180	$12,837	-$657
109531304	Coudersport Area SD	Potter	951	$9,131	$10,896	-$1,765
109532804	Galeton Area SD	Potter	413	$12,215	$12,231	-$15

Appendix F continued

AUN	School District	County	2005-06 ADM	Comparison Spending per Pupil	Costing Out Estimate per Pupil	Total Difference per Pupil
109535504	Northern Potter SD	Potter	667	$10,617	$11,770	-$1,152
109537504	Oswayo Valley SD	Potter	558	$9,518	$11,530	-$2,013
129540803	Blue Mountain SD	Schuylkill	2,996	$8,132	$10,268	-$2,136
129544503	Mahanoy Area SD	Schuylkill	1,143	$9,773	$12,665	-$2,892
129544703	Minersville Area SD	Schuylkill	1,207	$7,903	$11,354	-$3,450
129545003	North Schuylkill SD	Schuylkill	1,985	$8,456	$11,092	-$2,636
129546003	Pine Grove Area SD	Schuylkill	1,761	$8,509	$10,373	-$1,864
129546103	Pottsville Area SD	Schuylkill	2,815	$9,213	$11,219	-$2,007
129546803	Saint Clair Area SD	Schuylkill	895	$7,824	$11,232	-$3,408
129547303	Schuylkill Haven Area SD	Schuylkill	1,456	$7,785	$11,001	-$3,215
129547203	Shenandoah Valley SD	Schuylkill	1,150	$8,176	$12,462	-$4,286
129547603	Tamaqua Area SD	Schuylkill	2,234	$8,856	$10,851	-$1,995
129547803	Tri-Valley SD	Schuylkill	920	$9,573	$11,320	-$1,748
129548803	Williams Valley SD	Schuylkill	1,188	$9,080	$11,406	-$2,326
116555003	Midd-West SD	Snyder	2,430	$7,570	$11,247	-$3,677
116557103	Selinsgrove Area SD	Snyder	2,806	$8,409	$10,885	-$2,476
108561003	Berlin Brothersvalley SD	Somerset	963	$8,427	$11,092	-$2,665
108561803	Conemaugh Twp Area SD	Somerset	1,113	$9,091	$11,383	-$2,292
108565203	Meyersdale Area SD	Somerset	1,025	$9,769	$11,096	-$1,327
108565503	North Star SD	Somerset	1,332	$8,872	$11,590	-$2,718
108566303	Rockwood Area SD	Somerset	909	$8,420	$10,864	-$2,444
108567004	Salisbury-Elk Lick SD	Somerset	378	$9,265	$11,612	-$2,347
108567204	Shade-Central City SD	Somerset	625	$9,155	$11,976	-$2,820
108567404	Shanksville-Stonycreek SD	Somerset	459	$9,187	$11,744	-$2,557
108567703	Somerset Area SD	Somerset	2,704	$9,441	$10,894	-$1,453
108568404	Turkeyfoot Valley Area SD	Somerset	406	$9,592	$11,501	-$1,909
108569103	Windber Area SD	Somerset	1,406	$8,565	$10,952	-$2,388
117576303	Sullivan County SD	Sullivan	803	$11,429	$11,170	$259
119581003	Blue Ridge SD	Susquehanna	1,235	$9,590	$11,657	-$2,067
119582503	Elk Lake SD	Susquehanna	1,470	$8,940	$11,017	-$2,077
119583003	Forest City Regional SD	Susquehanna	964	$8,934	$11,492	-$2,558
119584503	Montrose Area SD	Susquehanna	1,964	$9,255	$11,321	-$2,066
119584603	Mountain View SD	Susquehanna	1,412	$8,436	$11,185	-$2,748
119586503	Susquehanna Comm SD	Susquehanna	1,005	$10,295	$12,188	-$1,894
117596003	Northern Tioga SD	Tioga	2,452	$8,284	$11,117	-$2,833
117597003	Southern Tioga SD	Tioga	2,229	$8,659	$11,099	-$2,440
117598503	Wellsboro Area SD	Tioga	1,585	$10,043	$11,132	-$1,089
116604003	Lewisburg Area SD	Union	1,858	$9,242	$10,783	-$1,541
116605003	Mifflinburg Area SD	Union	2,400	$7,961	$11,166	-$3,205
106611303	Cranberry Area SD	Venango	1,415	$9,292	$11,779	-$2,487
106612203	Franklin Area SD	Venango	2,354	$10,700	$11,989	-$1,288
106616203	Oil City Area SD	Venango	2,494	$8,964	$11,931	-$2,967
106617203	Titusville Area SD	Venango	2,320	$8,750	$11,497	-$2,747
106618603	Valley Grove SD	Venango	1,007	$8,700	$11,840	-$3,140
105628302	Warren County SD	Warren	5,869	$9,094	$10,664	-$1,570
101630504	Avella Area SD	Washington	769	$9,108	$12,576	-$3,468
101630903	Bentworth SD	Washington	1,212	$9,323	$12,001	-$2,678
101631003	Bethlehem-Center SD	Washington	1,422	$9,112	$12,294	-$3,182
101631203	Burgettstown Area SD	Washington	1,576	$7,783	$11,811	-$4,027
101631503	California Area SD	Washington	1,047	$9,307	$12,616	-$3,309
101631703	Canon-Mcmillan SD	Washington	4,593	$8,501	$10,580	-$2,079
101631803	Charleroi SD	Washington	1,700	$8,775	$12,298	-$3,523
101631903	Chartiers-Houston SD	Washington	1,207	$8,770	$11,671	-$2,901
101632403	Fort Cherry SD	Washington	1,253	$9,034	$11,929	-$2,895
101633903	Mcguffey SD	Washington	2,269	$9,562	$11,465	-$1,902
101636503	Peters Township SD	Washington	4,198	$7,638	$9,493	-$1,855
101637002	Ringgold SD	Washington	3,590	$7,303	$11,867	-$4,564
101638003	Trinity Area SD	Washington	3,759	$8,399	$10,775	-$2,376
101638803	Washington SD	Washington	1,954	$10,178	$13,243	-$3,066
119648303	Wallenpaupack Area SD	Wayne	4,048	$9,477	$11,014	-$1,537
119648703	Wayne Highlands SD	Wayne	3,352	$8,751	$10,629	-$1,877
119648903	Western Wayne SD	Wayne	2,583	$9,628	$11,177	-$1,549
107650603	Belle Vernon Area SD	Westmoreland	2,934	$8,094	$11,397	-$3,303
107650703	Burrell SD	Westmoreland	2,155	$8,349	$10,954	-$2,605
107651603	Derry Area SD	Westmoreland	2,665	$8,379	$11,216	-$2,836
107652603	Franklin Regional SD	Westmoreland	3,794	$8,176	$10,415	-$2,239
107653102	Greater Latrobe SD	Westmoreland	4,367	$7,537	$10,567	-$3,031
107653203	Greensburg Salem SD	Westmoreland	3,360	$8,201	$11,564	-$3,363
107653802	Hempfield Area SD	Westmoreland	6,748	$8,922	$10,341	-$1,419
107654103	Jeannette City SD	Westmoreland	1,362	$9,143	$12,627	-$3,484
107654403	Kiski Area SD	Westmoreland	4,474	$8,155	$10,947	-$2,792
107654903	Ligonier Valley SD	Westmoreland	2,134	$8,838	$11,184	-$2,346
107655803	Monessen City SD	Westmoreland	1,050	$9,802	$12,984	-$3,182
107655903	Mount Pleasant Area SD	Westmoreland	2,515	$8,385	$11,590	-$3,205
107656303	New Kensington-Arnold SD	Westmoreland	2,500	$8,376	$12,545	-$4,169
107656502	Norwin SD	Westmoreland	5,314	$7,406	$10,382	-$2,977
107657103	Penn-Trafford SD	Westmoreland	4,723	$7,034	$9,814	-$2,780
107657503	Southmoreland SD	Westmoreland	2,307	$8,477	$12,156	-$3,679
107658903	Yough SD	Westmoreland	2,562	$7,742	$11,366	-$3,623
119665003	Lackawanna Trail SD	Wyoming	1,346	$9,822	$11,910	-$2,088
118667503	Tunkhannock Area SD	Wyoming	3,093	$9,603	$11,176	-$1,573
112671303	Central York SD	York	5,366	$7,766	$10,234	-$2,468
112671603	Dallastown Area SD	York	6,054	$9,290	$10,045	-$754
112671803	Dover Area SD	York	3,759	$8,457	$10,947	-$2,491
112672203	Eastern York SD	York	2,858	$8,874	$11,298	-$2,424
112672803	Hanover Public SD	York	1,770	$10,001	$12,553	-$2,552
112674403	Northeastern York SD	York	3,547	$7,965	$11,278	-$3,313
115674603	Northern York County SD	York	3,234	$7,933	$10,534	-$2,601
112675503	Red Lion Area SD	York	6,117	$7,609	$10,457	-$2,848
112676203	South Eastern SD	York	3,431	$8,014	$10,676	-$2,663
112676403	South Western SD	York	4,210	$7,922	$10,312	-$2,390
112676503	Southern York County SD	York	3,387	$8,542	$10,898	-$2,356
112676703	Spring Grove Area SD	York	4,041	$8,059	$10,961	-$2,902
115219002	West Shore SD	York	8,365	$7,722	$10,856	-$3,134
112678503	West York Area SD	York	3,402	$7,833	$10,775	-$2,941
112679002	York City SD	York	7,574	$9,273	$15,526	-$6,253
112679403	York Suburban SD	York	2,821	$10,543	$11,070	-$528



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April 1, 2013

An Independent Review of Maine's Essential Programs and Services Funding Act: Part 1

Presented to the
Maine Legislature's
Joint Standing Committee on Education and Cultural Affairs

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EXECUTIVE SUMMARY, PART 1[1]

This document reports the findings of Part 1 of *An Independent Review of Maine's Essential Programs and Services Funding Act* (EPS) conducted by Lawrence O. Picus and Associates under contract with the Maine Legislative Council, and submitted to the Joint Standing Committee on Education and Cultural Affairs. The study, in progress between October 1, 2012 and December 1, 2013 (with anticipated presentations to the Legislature during its 2014 session), examines multiple aspects of the EPS.

Part 1 of the study (conducted between October 2012 and March 2013) includes the following:

- A detailed description of the operation of the EPS
- Comparative analyses of school funding systems in other states
- An analysis of traditional school finance equity measures as applied to Maine
- A specific analysis of funding for Native American Tribal schools
- A comparison of resource capacity and use by school districts compared to our Evidence-Based model (EBM) of school finance – a model that relies on research based approaches to ensure schools have the capacity to improve student learning and reduce achievement gaps
- A discussion of alternative approaches to teacher compensation.

In this report we describe the operation of Maine's EPS funding system in detail and offer preliminary conclusions and recommendations about the operation of the system, with the understanding that our work in Part 2 of the study will further inform and refine our findings in Part 1.

Overall, we found that the Maine's per pupil expenditures for K-12 education are among the highest in the United States – although they are comparatively low among the six New England States. Moreover, the distribution of revenues to local districts (SAUs) meets accepted levels of equity based on current school finance literature. While expenditures have grown in recent years, student performance has been relatively flat. Test scores compared to the rest of the country are relatively strong but about average in comparison with the other states in New England. The system operates well, but we identified a number of issues the state may want to consider as it moves forward in its efforts to improve learning for all children in its public schools.

Part 2 of the study will include a professional judgment panel assessment of EPS and our EBM; an assessment of education strategies identified through case studies of improving schools; the development of a school finance model that will compute levels of adequacy for Maine using our EBM; and structured analyses of possible teacher compensation models based on interactive discussions with the Committee.

[1] This document is the first of two reports to be submitted to the Maine Legislature's Joint Standing Committee on Education and Cultural Affairs evaluating the state's Essential Programs and Services Funding Act.

OVERALL FUNDING SYSTEM

Maine's Essential Programs and Services Funding Act (EPS) controls the way school districts receive their revenues. The program is based on an adequacy model – that is one that identifies the resources needed to provide educational services that will enable students to meet Maine's educational proficiency standards (the *Learning Results*), and then through a combination of state and local tax sources provides revenue to purchase those resources. School districts are able to raise additional funds through property tax levies. The EPS has been used to distribute revenues to school districts since the 2005-06 fiscal year. Details regarding the operation of the EPS are provided in chapter 2 of this report.

As part of our study, we identified the following issues of concern to state policy makers and education stakeholders:

- Is the EPS Adequate and Accurate? Perhaps the primary question addressed by this study is whether the EPS computations accurately estimate adequate funding levels to provide a comprehensive education system in Maine, and do the *Learning Results* meet the requirements of such a comprehensive system.

- Are the adjustments to the EPS computations fair? These include: the complexity of the special education adjustment; the regional cost adjustment and the reduction of Federal Title I receipts in computing each School Administrative Unit's (SAU)[2] total allocation. In addition, several individuals indicated that there are concerns with the adjustments for small schools in the model.

- Do SAUs rely too heavily on local property taxes for revenues above the EPS funding level? A concern frequently expressed was the amount of total K-12 education expenditures that are outside of the EPS system and currently funded completely through local property taxes.

- Should the state fully fund its share of 55% of the EPS, and what is the appropriate split between state and local revenue sources in Maine? A voter-approved initiative requires the state to fund 55% of the costs of the EPS system. To date, state funding has not reached that goal, and to some extent the state share has declined in recent years. Regardless of whether the state share is fully funded, the relative share of state (generally sales and income tax funded) and local (generally property tax funded) contributions to education funding is of utmost importance. The question includes both the policy issue of appropriate shares, as well as the relative distribution – and hence funding equity – across individual SAUs. The analyses in Chapters 3 and 4 of this report provide national

[2] School Administrative Units (SAUs) are the district level unit of analysis in this document. Maine has six categories of school districts, the organization of which has much to do with the location and historical development of each district. However, for the purposes of funding the EPS, all can be identified into SAUs, so we have used that designation for the district level of analysis throughout this report.

and New England based comparisons showing how other states address this issue along with an analysis of the school finance equity of the current system.

- What is the appropriate measure of SAU fiscal capacity? A common concern across the state has been about areas of the state that are property wealthy but have low per capita incomes creating high property taxes for year round residents of these areas. To assess this issue we measure the fiscal neutrality and equity of the funding system through a school finance lens and consider alternative measures of fiscal capacity to address this issue.

We anticipate additional concerns will emerge as the study progresses. Our intent is to address them as appropriate – and as prioritized by the Committee – as our work continues.

COMPARISON WITH OTHER STATES

Maine's K-12 education system has witnessed a steady increase in spending over the past several years. However, this additional funding appears to have only resulted in modest improvements in the academic performance of the state's students. The findings from our interstate comparison can be summarized as follows:

Educational Expenditures

- From 1999-2000 to 2009-2010 state and local revenue for public K-12 education in Maine grew from $1.62 billion to $2.35 billion - an increase of just over $728.6 million or 45%. During the same time period, state and local revenue for K-12 education in all 50 states increased by 49.4% ($171.6 billion). (U.S. Census, 2012)
- Between 1999-2000 and 2009-2010 Maine's per pupil expenditures grew from $7,595 to $12,259 an increase of 61.4%. Average per pupil expenditures on a national level increased from $6,836 to $10,600, a 55.1% increase during this same time period. (U.S. Census, 2012)

Student Population

- Maine has experienced a decrease in student population of 20,533 (10%) over the past decade (2001-2002 to 2011-2012).
- Average school district size has declined to 808 students – making the state's school districts the 4th smallest in the nation with an average enrollment that is 25.4% the size of the average school district in the United States.

Staffing

- Maine has seen an increase in the number of new teachers and a slight reduction in the number of administrators in the past decade.
- When combined with the decline in student enrollments Maine has one of the lowest student to teacher ratios in the country.

- The reduced student to teacher ratios are a major cause of the state's increases in per pupil expenditures.

Student Achievement

- In 2011, Maine's student test results on the National Assessment of Educational Progress (NAEP) in math and reading were mixed when compared to other states.
- Maine has a four-year high school graduation rate of 79.9% which is 4.4% above the national average, but trails many comparable states.
- Maine's New England Common Assessment Program (NECAP) test results have been flat over the past two years and trail the scores of students in New Hampshire and Vermont in math and writing in all grades and reading in all but the 3rd grade.

EQUITY ANALYSIS

Overall, Maine has designed a school funding system that provides districts with an equitable resource distribution, as revenues are computed by the system. Within the EPS component our analysis shows Maine's equity to generally meet the strict equity standards established in the school finance literature. When all education funds are included, the system remains quite equitable compared to other states although it does not always meet the strict standards found in the literature. The funding disparities we identified appear to be based more on wealth than student need.

- We found no relationship between EPS per pupil funding and district property wealth. The Maine system, as designed, met (or very nearly) met all of the strict benchmarks established by Odden and Picus (2014) for fiscal neutrality and equity. In other words, the level of spending was not strongly related to the wealth of the SAU (measured in terms of property wealth per pupil and in terms of per-capita income), and overall per pupil spending levels were generally equitable across all students. When adjusted for student characteristics, per pupil spending remained equitable, providing roughly the same level of revenue for students with similar characteristics.

- When we included local revenue raised through property taxes above the level of EPS funding, we found that SAUs with greater wealth – measures on the basis of property wealth per pupil or per capita income – had a slightly higher level of per pupil expenditures than lower wealth SAUs. While of concern, overall equity statistics suggested greater equity than found in most other states.

- The equity of the system worsens slightly when student needs are taken into account. This implies that some of the funding disparities found are not attributable to meeting the special needs of at risk students. We recommend the state consider new ways of providing funds to school districts in order to help them meet the needs of their neediest students.

TRIBAL FUNDING

Our primary finding from an assessment of Tribal funding in Maine and across the United States is that each state has its own approach for funding schools for Native American children. These approaches rely on a combination of state and Federal sources and are hard to compare across states. If Maine wants to provide more funds for indigenous students, the state could encourage districts to take advantage of available Title VII funds, as a number of eligible SAUs do not.

Our specific findings related to tribal funding include:

- The three Maine Indian Education schools appear to receive total per pupil revenues that are substantially higher than the state average funding level.
- The mix of state and federal funding for the tribal schools in Maine is set by the Maine Indian Claims Settlement Act of 1980. It would require tribal and federal agreement to modify the Act.
- Most Maine school districts that are eligible for Title VII funds (districts serving 10 or more American Indian/Alaska Native students) do not receive the funds. Districts could apply for these moneys, generally about $300 per student, which are supplemental and can be used for a broad array of approaches to support indigenous students.
- The state of Maine should decide whether or not to provide a different set of options for secondary students exiting the tribal schools, depending on whether there is evidence about whether these students are succeeding in high school.
- The Committee may want to study spending patterns in the tribal school more closely to determine if there are more effective ways to use existing resources to improve student learning.

COMPARISON OF EPS WITH EBM

The report also provides a side-by-side comparison of the elements of Maine's EPS with the elements of the Evidence Based Model (EB) that we have developed for use in other states. We also provide the research basis surrounding each individual issue.[3]

The EB model uses a similar structure and approach to that used by the EPS in Maine. The EB model provides resources to meet all seven *Learning Results* categories and provides additional resources that, in our view, would establish a comprehensive education system as called for in the Resolve establishing this study. It is our view that the EB model provides sufficient resources for all schools to offer a full liberal arts curriculum that offers an education program designed to meet college and career-ready standards for all students. The EB approach is also sufficient to allow schools in Maine to dramatically increase student achievement on standardized performance tests such as the NECAP.

[3] Readers interested in more detail on the EB are referred to our textbook, *School Finance: A Policy Analysis, 5th Edition*. (Odden & Picus, 2014).

The comparisons between EPS and EB result in a number of differences in the specific staffing ratios for different grade levels, educational programs and support services, as well as differences in per pupil funding levels for certain resources. It appears that in some instances the cost of EPS exceeds the EB and in others the reverse is true. Once we have completed our EB model for Maine in Part 2 of the study, we will be able to quantify those differences by specific program area.

In Part 2 of the study we will work with the Committee to assess the similarities and differences between the EB and the EPS, including an assessment of the cost differences between the two models. We look forward to ongoing discussions with the Committee as it decides whether to modify the current EPS approach, shift to the EB model's ratios and formulas, or establishes a funding model that includes a combination of both approaches.

TEACHER COMPENSATION

In Part 1 of this study, we reviewed the current teacher compensation system in Maine and reviewed state and district level teacher compensation reforms focused on improving teacher effectiveness. Unfortunately, many of these initiatives have not been carefully studied so the strengths and weaknesses of each are hard to discern. With that in mind, we reached the following conclusions about teacher compensation issues in Maine:

- Maine's goal of providing regional adjustments for teacher salary differences is appropriate but the index currently in use does not correctly control for teacher quality. It provides more resources for districts that have chosen to pay higher salaries in the past and fewer resources to districts that paid lower salaries in the past. As a result, SAUs do not have an equal chance at recruiting and retaining effective teachers.

- Following a comprehensive review of other states' efforts to reform teacher compensation, based on the often disappointing findings from these efforts and based on Maine's own experiences, we offer the following recommendations:

    1. Maine should replace its approach to providing regional adjustments to teacher salary levels and shift to either a Comparable Wage Index or a Hedonic Wage Index.

    2. To determine if current teacher salaries are at the appropriate market level, Maine should benchmark teacher salaries to salaries in Maine for jobs that are comparable to teaching, not to other states or the national average.

    3. Maine should be more strategic in recruiting and retaining effective teachers by shifting its teacher salary structure from the current system based on years of experience and education – which is not strongly linked to effectiveness. The new structure should provide major salary increases when a teacher's instructional effectiveness improves.

    4. If, after making these changes, some SAUs continue to have difficulty staffing schools or subject areas, the state could consider provision of additional incentives for hard to staff subjects or hard to staff schools.

5. If Maine decides to create any of these compensation incentives, the key features should be developed at the state level. Nearly all other states that have devolved the design of performance pay incentives to local districts have not been satisfied with the results.

6. The state should fund ongoing analyses of the implementation and impact of the incentive programs to determine whether they are working to move effective teachers into hard to staff schools and subjects and to retain them at those sites.

We will present these findings and recommendations to the Joint Standing Committee on Education and Cultural Affairs on April 10, 2013, and participate in a public forum the following morning. Following that, we will meet with the committee to develop a strategy and work plan for our work on Part 2 of this study, which is due on December 1, 2013.

CHAPTER 1: INTRODUCTION

This document is the first of two reports to be submitted to the Maine Legislature's Joint Standing Committee on Education and Cultural Affairs (hereinafter the Committee) evaluating the state's Essential Programs and Services Funding Act (EPS). Prepared by Lawrence O. Picus and Associates under contract with the Maine Legislative Council, this study, which is being conducted between October 1, 2012 and December 1, 2013 (with anticipated presentations to the Legislature during its 2014 session), examines multiple aspects of the EPS. Part one of the study (this report) includes: a detailed description of the operation of the EPS; comparative analyses of school funding systems in other states; an analysis of traditional school finance equity measures as applied to Maine; a specific analysis of funding for Native American Tribal schools; a comparison of resource capacity and use by school districts compared to our Evidence-Based model (EBM) of school finance – a model that relies on research based approaches to ensure schools have the capacity to improve student learning and reduce achievement gaps; and a discussion of alternative approaches to teacher compensation. Future analyses (part 2 of the study) will include a professional judgment panel assessment of EPS and EBM; an assessment of education strategies identified through case studies of improving schools; the development of a school finance model that will compute levels of adequacy for Maine using our EBM; and structured analyses of possible teacher compensation models based on interactive discussions with the Committee.

This document represents the initial phase of the study. The work reported here describes the state's school finance system, provides comparisons with other states and identifies issues that will drive the work in part 2 of the study. Chapters 2-7 offer our findings to date, identify potential areas for further discussion, and provide initial recommendations for further study. This information was gathered through review of official documents, two data collection trips to Maine that included meetings with the Committee, Legislative staff, officials of the Maine Department of Education, representatives of education stakeholder groups and a public hearing (held under the auspices of the Committee). We have worked closely with all of these groups to gather the data reported here. As agreed upon with the Committee and staff, the second part of the study will be highly interactive wherein we will work with the Committee and other stakeholders at all levels of Maine's education system to identify solutions to the issues identified in this document. The balance of this chapter introduces the topics that follow.

In chapter 2, we present a detailed discussion on the operation of the EPS along with a list of issues and concerns that were generated during our research and site visits to Maine. Chapter 3 presents a fifty state comparison of important educational statistics, along with a more in-depth comparison to the five other New England states as well as Iowa and Wisconsin – two states with enough similarities to warrant the same in-depth analysis. Our comparisons include measures of school district revenue and expenditures, including levels, growth and types of expenditures. We provide analyses of various measures of taxpayer effort for education spending along with the revenue and expenditure data. Our comparison also includes measures of accountability including test results from the National Assessment of Educational Progress (NAEP) and the New England Common Assessment Program (NECAP) along with data on

school completion, dropouts and college enrollment. The chapter also provides data on the relative share of education revenues provided to schools by the Federal, state and local school districts in each state.

Chapter 4 offers a traditional school finance equity analysis focused on ascertaining if there is a relationship between either property wealth or per capita income and per student educational revenues. One of the goals of EPS is an equitable distribution of funds across school districts, our analysis compares the findings for Maine with traditionally accepted standards of equity used by school finance researchers across the United States.

Chapter 5 provides an analysis of funding for Tribal schools in Maine. The analysis provides detailed revenue data for the three Tribal schools in the state along with information on the various approaches used in other states (in combination with Federal funding) to meet the needs of Native American education.

Chapter 6 offers a detailed comparison of the EPS with one alternative approach to determining school finance adequacy, the EBM. Using a series of explanatory tables, we compare the EPS to the EBM and then offer our assessment of what we know from current research about each topic. The EPS system was developed to provide funding adequacy (a sufficient level of funding to enable all – or most – students to meet Maine's proficiency standards). In this chapter we offer our knowledge base as to how to approach answering the question of what is an adequate level of education funding.

Teacher compensation is an important issue in today's education policy debates. In chapter 7 we offer a discussion of efforts in other states to change teacher compensation systems to employ and retain the highest quality teachers and to reward teachers for their performance. Our discussion shows what other states have done in the past on this important issue and offers a series of lessons learned for Maine as it begins discussions of alternative teacher compensation plans.

Chapter 8 summarizes our findings and outlines our recommendations for moving forward with the second part of this study. In the work that follows presentation of this report, we will develop an interactive program of studies and analyses, working with the Committee and seeking stakeholder input at regular and frequent intervals. The report for Part 2 of this study is due on December 1, 2013 and will contain our recommendations for Maine.

CHAPTER 2: DESCRIPTION OF MAINE'S ESSENTIAL PROGRAMS AND SERVICES FUNDING MODEL

This chapter provides a description of the Essential Programs and Services Funding Model (EPS). It describes how the level of revenue needed for each SAU is estimated and provides a general description of how revenues are allocated to each SAU. The EPS is an adequacy based funding model – that is its purpose is to estimate how much revenue each SAU needs so that there is a reasonable opportunity for each student to be able to achieve the state's *Learning Results*.

We start our discussion in this chapter with a general overview of school finance adequacy to place Maine's EPS system in context. A brief historical description of the EPS along with a discussion of how the components of the EPS are computed follows. This discussion complements the detailed discussion of the EPS that appears in Chapter 6 here we focus more on the conceptual development of the EPS model itself.

Estimation of an adequate funding level is only the first step in developing a state funding system. Once the need is understood, it is up to the state to find a combination of state and local tax revenues that will equitably fund SAUs. The second section of this chapter describes how each SAU's EPS allocation is computed and funded. It includes a description of how the Maine Department of Education (DOE) computes each district's total allocation and how that allocation is funded through state and local revenues. SAUs are then able to raise additional local revenues to fund additional services for children beyond that funded by the EPS.

In the third section of this chapter we describe a number of funding issues that were identified in our visits to Maine in October 2012 and February 2013. Our purpose at this time is to identify the concerns and issues brought forward. Once the information in the chapters that follow has been reviewed, we will work with the Committee to develop a plan to consider modifications to the computation of the adequacy level in the EPS and to understand the implications of alternative ways to provide SAUs with the levels of revenue estimated by the EPS model.

DETERMINING AN ADEQUATE LEVEL OF FUNDING FOR PRE-K THROUGH 12TH GRADE EDUCATION

For most of the 20th century school finance focused on providing equity in the funding of schools within a state. The goal was to ensure that school districts had roughly equal levels of revenue per pupil regardless of the wealth of the district (as measured by property value per pupil in most states). An equitable distribution of educational resources is still an important focus of state school finance systems, and Chapter 4 of this report provides estimates of the equity of Maine's funding system.

However simply considering equity does not answer the complex question of how much money a school or school district needs to ensure all students can perform at state standards. In fact until recently, school funding levels in most states were often a function of how much money was

available for appropriation at the state level and how much local taxpayers were willing to tax themselves to fund schools.

With the growth of the standards movement in the late 20th century, there has been increasing attention paid to how much money is needed to educate students adequately. Beginning with the Kentucky Supreme Court's *Rose*[4] decision in 1989, the issue of adequacy has risen in importance in school finance. Courts in a number of states have required their state to define what an adequate education would be and then to fund the resources necessary to ensure most, if not all, children can meet those standards.

Because not all children are alike, nor do they come to school with similar experiences or backgrounds, and because school district characteristics vary considerably as well, estimating how much money a school or district needs to ensure a student has the opportunity to meet his or her state standards for proficiency is a complex and uncertain task. To date four methods have emerged to estimate an adequate level of resources.[5]

Successful Districts/Schools

Under this approach, school districts (sometimes schools) that have successfully met a set of established criteria are identified. The per pupil costs of these schools/districts are used as the estimate of an adequate level of funding. Most models make adjustments for student characteristics such as low income and English language learners (ELL). This method was developed in the late 1990s in Ohio. Because successful districts are often suburban systems or small rural school districts, it has been hard to apply to large urban schools or to districts with high incidences of at risk students.

Cost Functions

This approach relies on econometric modeling to estimate the level of funds needed to achieve the desired level of student performance as measured by standardized testing while controlling for the characteristics of students, schools and school districts. This approach has been used in a number of states to estimate adequate levels of funding. The results of these models are frequently used in school finance litigation in the states.

The difficulty with using either the successful districts/schools or the cost function model is that neither approach provides guidance as to how the funds should be used by schools to produce student learning. Consequently, two other approaches – Professional Judgment and Evidence-Based – have emerged as ways to estimate adequate school funding levels.

Professional Judgment

This approach relies on the knowledge of education professionals to identify the components and resources needed at a school to ensure students are able to meet state proficiency standards. Pioneered in Wyoming in the late 1990s, professional judgment panels are used to recommend

[4] *Rose v. Council for Better Education*, 790 S.W. 2d 186 (Kent. 1989)
[5] More details on these models can be found in Odden and Picus (2014).

resource levels for prototype schools at the elementary, intermediate and high school level. Panel members make recommendations about average class size to estimate the number of teachers needed in a school along with other professional staff positions. They also provide their judgment as to the level of fiscal resources needed for instructional materials, and other school services. Panels can also be used to estimate resources for non-instructional services such as maintenance and operations. Once the resource needs are identified, the costs of each component are determined, summed for each school and aggregated to the district level where they are combined with district cost estimates to generate a total school district funding level.

Evidence-Based Model

This approach is similar to the professional judgment approach in that it uses prototypical schools to determine educational resource needs. The major difference is this approach starts by reviewing educational research literature to identify programs and strategies that have evidence of improving student learning if implemented appropriately, and then estimates the resources needed at each prototypical school to implement those strategies. The costs of those resources are then determined, aggregated to the district level and combined with estimates of district costs to compute each school district's funding level.

The Professional Judgment Panel (PJP) and Evidence-Based Model (EBM) methods are clearly similar in design and approach. In fact, as they are implemented, they often share methodologies – that is PJP panels often are provided information on educational research findings, and EBM estimates are frequently presented to panels of education professionals in individual states to assess the recommendations in light of actual education practices in those states.

According to Silvernail (2011), Maine's EPS was developed using a hybrid approach that included the first three models described above. Below we provide a brief history of the development of EPS based on Silvernail's account, and then offer an explanation of how the EPS is used to compute each SAU's funding allocation.

HISTORICAL CONTEXT

Maine was one of the first states to consider adequacy in the development of its funding system, and the current EPS approach grew out of legislation passed in 1996 and 1997 (LD958 and LD1137 respectively) directing the Maine State Board of Education to establish a plan for defining and funding what have become known as the *Learning Results*, a set of expected learning outcomes that were originally developed by a Task Force established in 1995 (Silvernail, 2011).

A seventeen-member committee, supported by the University of Southern Maine's Maine Education Policy Research Institute, developed the initial EPS model focusing on the resources it believed were needed to achieve the *Learning Results*. The committee recognized that the cost of the EPS as identified did not include all costs of education, but chose intentionally to focus on those resources needed to meet the *Learning Results*.

The committee identified eight essential programs that schools needed to offer to meet the *Learning Results* and then developed a set of Essential Services – the resources and services needed to ensure each Maine student had an equitable chance to achieve the *Learning Results*. Silvernail (2011) identifies the eight essential programs as:

- Career preparation
- English and Language Arts
- Health and Physical Education
- Mathematics
- Modern and Classical Languages
- Science and Technology
- Social Studies
- Visual and Performing Arts

The essential services identified as necessary to meet the goals established by the Learning Results were categorized as follows (Silvernail, 2011):

- School personnel
  - Regular classroom and special subject teachers
  - Education technicians
  - Counseling/guidance staff
  - Library staff
  - Health staff
  - Administrative staff
  - Support/clerical staff
  - Substitute teachers
- Supplies and Equipment
- Resources for specialized student populations
  - Special needs pupils
  - Limited English Proficiency (LEP) students
  - Disadvantaged youth
  - Primary (K-2) grade children
- Specialized services
  - Professional development
  - Instructional leadership support
  - Student assessment
  - Technology
  - Co-curricular student learning
- District services
  - System administration
  - Maintenance and operations
- School level adjustments
  - Vocational education
  - Teacher educational attainment
  - Transportation
  - Small schools

- Debt services

As is typical for adequacy models, the EPS was developed using prototypical schools to facilitate resource estimation. Maine used prototypical school sizes as follows:

- Elementary (K-5) – 250 students
- Middle (6-8) – 400 students
- Secondary School (9-12) – 500 students

These prototypical schools were used to establish resource levels. Actual distribution of funds to SAUs today is based on staff to student ratios and dollar per pupil allocations that do not specifically rely on the prototypical schools.

Relying on a process Silvernail (2011) identifies as a "hybrid approach," the committee developed a set of resource estimates and their associated costs. This original EPS model was presented to the Legislature in 1999 beginning a multi-year process of debate and modifications, as well as the development of an implementation plan, before the EPS was implemented for the 2005-06 fiscal year. As part of the implementation, various components of the EPS model are reviewed on a three year rotating basis and adjustments are made as needs are identified. Based on our discussions with DOE staff in Maine, relatively few adjustments have been made over time.[6]

The discussion that follows describes the current formulas for computing EPS allocations to school districts for the 2012-13 school year.

COMPUTING THE EPS FOR EACH SCHOOL ADMINISTRATIVE UNIT (SAU)

In this section we provide a general description of how the EPS is computed for SAUs. For fiscal year 2013, total EPS funding (including state contributions to the teacher retirement system) was over $2 billion. The next section describes in detail how these funds are raised and distributed. We show how that total is arrived at using the structure of the DOE's ED279 form as the basis for describing the process of determining each SAU's total funding allocation.
In general, the process begins by determining an EPS per pupil rate for each SAU. This rate is based on a count of attending pupils (described below); and separate estimates for elementary (K-8) and secondary (9-12) students are computed. This figure is then applied to the count of subsidizable or resident pupils (described below), adjusted on the basis of pupil and district characteristics and summed to determine each SAU's total EPS operating allocation. The individual steps are described below.

Before continuing it is important to provide a brief note on school district designations. Throughout this document, we refer to the administrative unit of analysis as a School Administrative Unit or SAU. In fact, Maine has six categories of school districts the organization of which has much to do with the location and historical development of the district.

[6] Silvernail (2011) provides an excellent description of the original proposal and the modifications to EPS that have occurred both since the 1999 Committee report and since initial implementation of the EPS in FY 2006.

However, for the purposes of funding the EPS, all can be identified a part of an SAU, so we have used that designation for the district level of analysis throughout this report.

Determination of the EPS Per Pupil Rate

Attending Pupils

The first step in the process is to determine the number of attending pupils. This figure is used as the enrollment figure for determining the EPS per pupil funding rate for each SAU. The funding rate is a per pupil revenue figure – determined separately for elementary (K-8) and secondary (9-12) grades and then applied in the actual distribution of funds to schools.

Attending pupils are computed as the average of the April and October pupil counts from the calendar year before the beginning of the funding school year. For example, funding rates for the 2012-13 fiscal year are based on the average of attending pupils calculated in April and October 2011. The average is computed separately for grades K-5, 6-8, and 9-12. The elementary and middle average is then summed to determine the K-8 attending pupil count. These attending pupil counts are used when the staffing ratios and per pupil funding levels are applied to estimate the EPS rate for each SAU.

Preschool children are included in the regular K-5 and K-8 pupil counts and included in the computations for elementary schools (K-5 or K-8 depending on the computation as described below). If enrolled, four-year-olds (4YO) and Pre-K (PK) students are included in this count as 1.0 attending pupil, even if enrolled less than full time.

Staff Positions

The attending pupil counts are used to generate EPS funded positions for teachers and other district staff. Beginning with the 2012-13 fiscal year, the ratios used to generate EPS position counts for positions other than teachers were decreased by 10% for SAUs with fewer than 1,200 attending pupils (generating 10% more staff in non-teaching positions). Table 2.1 summarizes the staff allocations for SAUs with 1,200 or more attending pupils and for SAUs with fewer than 1,200 attending pupils.

The number of EPS staffing positions generated are then multiplied by the EPS salary allowance for each position and summed to get total salaries for elementary (K-8) and secondary (9-12) staff.

Other Support Costs

Additional support costs are funded on a per pupil basis. This computation is also based on attending pupils and the amounts generated for K-8 and 9-12 students are summarized in Table 2.2. The amounts displayed in Table 2.2 are then multiplied by the corresponding enrollment counts for K-8 and 9-12. These figures are adjusted on an annual basis to account for inflation.

Table 2.1: Staff Allocation Ratios for EPS, FY 2013

		Pupils per Staff Position		
	Position	**K-5**	**6-8**	**9-12**
SAUs with 1,200 or more attending pupils	Teachers	17	16	15
	Guidance Counselors	350	350	250
	Librarians	800	800	800
	Health	800	800	800
	Education Technicians	100	100	250
	Library Technicians	500	500	500
	Clerical	200	200	200
	School Administration	305	305	315
SAUs with fewer than 1,200 attending pupils	Teachers	17	16	15
	Guidance Counselors	315	315	225
	Librarians	720	720	720
	Health	720	720	720
	Education Technicians	90	90	225
	Library Technicians	450	450	450
	Clerical	180	180	180
	School Administration	275	275	284

Table 2.2: EPS Per Pupil Allocations for Other Support Costs, FY 2013

	Dollar Amount per Attending Pupil ($)	
Support Cost Category	**K-8**	**9-12**
Substitute Teachers	37	37
Supplies and Equipment	346	478
Professional Development	59	59
Instructional Leadership Support	24	24
Co- and Extra- Curricular Student	34	114
System Administration/Support	220	220
Operations and Maintenance	1,013	1,204

Salary Benefits

Four different benefit rates are used depending on personnel category. The individual rates are applied to the salary totals for each category estimated in the first step of this process. The benefit rates used for teachers, guidance counselors, librarians, health professionals and school administrators are lower than for other staff categories because the state now contributes directly

to the retirement system for these credentialed positions. Table 2.3 summarizes the benefit rates used in the EPS rate computations for FY 2013.

Table 2.3: EPS Benefit Rates, FY 2013

Staff Category	Benefit Rate
Teachers, Guidance, Librarians, Health	19%
Education and Library Technicians	36%
Clerical	29%
School Administrators	14%

Regional Adjustment for Salaries, Benefits and Substitutes

In a state as large and diverse as Maine, it is not surprising that there are different regional cost factors that need to be accommodated in funding salaries in different parts of the state. The EPS includes a regional adjustment for salaries, benefits and substitutes computed in 2004-05 using teacher salaries as the basis for the regional adjustment. Specifically, the state was divided into 35 regional Labor Market Areas and the average salary – adjusted for teacher education and experience – was estimated for each area. This adjusted regional average was then divided by the state average teacher salary to determine the regional adjustment in each Labor Market Area. This adjustment, which ranges from a low of 0.84 to a high of 1.09 is then applied to each SAU's estimated total EPS salary, benefit and substitute computation based on the region in which the SAU is located (Silvernail, 2011).

Maine's regional adjustment differs from similar adjustments in other states in that it is based on variation in teacher salaries, not variation in the salaries of comparative occupations.

Adjustment for Title I Revenues

Before determining the EPS rate for an SAU, a portion of Title I revenues are subtracted from the total estimated allocation.

EPS Rate

The final EPS rate for each SAU is computed separately for elementary (K-8) and secondary (9-12) as the sum of the categories above minus the Title I revenues. This figure is divided by the attending pupil count for elementary (K-8) and secondary (9-12) resulting in each SAU's EPS rate. This figure is then used as the basis for another series of computations to determine the allocation of funds to each SAU and the relative shares of that total to be funded by the state and by the local SAU.

Determining the Total Allocation for Each SAU

This sub-section describes the computation of the adjustments made for student and SAU characteristics, and then describes allocations provided to SAUs for other subsidizable costs such as special education, vocational education, gifted and talented, transportation and debt service. It

should be noted that transportation and debt service, while part of the EPS computation are not specifically addressed in the balance of this document.

Subsidizable Pupils

The final allocation to each SAU uses a different pupil count than the attending pupil count described above. For the balance of the computations, the subsidizable pupil count is used. Subsidizable pupils are based on resident pupil counts rather than attending pupil counts; this means that students living in one SAU but attending another SAU are counted, for the purpose of funding allocations, in the SAU where they reside, not where they attend school. The subsidizable pupil count is based on the April and October pupil counts from the three years prior to the beginning of the fiscal year for which the EPS is being computed. For example, for fiscal year 2012-13, the subsidizable pupil count is the average of the pupil counts from April and October of 2011, 2010 and 2009. In addition, if the district has experienced a decline in enrollment, an adjustment factor is applied to provide a "soft landing" for districts. The subsidizable pupil count is estimated separately for K-8 and 9-12 students. It should be noted that pre-K students are counted in the K-8 pupil count.

The number of subsidizable pupils at each level is multiplied by the SAU's EPS funding rate to get an initial allocation. As described in the next sub-section, this amount is enhanced by further adjustments based on student and SAU characteristics. These include weighted counts, targeted funds and adjustments for isolated small schools.

Weighted Counts

Additional funding is provided for disadvantaged youth – children from low-income homes based on the free and reduced lunch count – and for children identified as Limited English Proficient.

For disadvantaged youth a weight of 0.15 is added to the number of students identified as disadvantaged. For K-8 the percentage of children who qualify for free and reduced price lunch is multiplied by the subsidizable pupil count and the weight of 0.15 times the elementary EPS rate applied to determine the allocation for K-8 students. The same process is used for 9-12 students except the K-8 percentage of free and reduced price lunch students is used rather than the actual percentage under the assumption that 9-12 free and reduced lunch participation frequently under-represents actual need. Of course, the secondary EPS rate is used for these students.

For LEP students weights are applied in a similar manner to both K-8 and 9-12 LEP counts. The weights that are used in these computations vary by the number of LEP students in each SAU and are displayed in Table 2.4.

Table 2.4: EPS Weights for LEP Students, FY 2013

SAU Enrollment	Weight for LEP Students
Less than 15	0.7
16 to 250	0.5
251 or more	0.525

Targeted Funds

The EPS provides funds on a per subsidizable pupil basis for both student assessment and technology, and establishes an additional student weight of 0.1 for subsidizable pupils in grades K-2.

For student assessment, the EPS provides $43 per subsidizable pupil for both elementary and secondary pupil counts. For technology resources EPS provides $98 per subsidizable pupil at the elementary (K-8) level and $296 per subsidizable pupil at the secondary (9-12) level. These amounts are multiplied by the appropriate subsidizable pupil count for each SAU and the total added to the SAU allocation.

The K-2 weight of 0.2 is applied to the count of subsidizable pupils in those grades and multiplied by the elementary EPS rate for the SAU. This figure is also added to the SAU's total allocation.

Isolated Small School Adjustment

Small school adjustments are provided for small elementary, secondary and island schools. Small elementary schools are those with fewer than 15 students per grade level with limited alternative school availability. SAU's with qualifying schools receive a 10% adjustment to the elementary EPS rate for the number of students in these schools.

Small secondary schools are those with fewer than 200 students per school, and are more than 10 miles from the nearest secondary school. For qualifying schools, the student teacher ratios are reduced to 11:1 for schools with fewer than 100 students and to 13:1 for schools with between 100 and 199 students.

For islands operating or transporting students to mainland schools the following adjustments are made to the SAU total allocation:

- For qualifying isolated small secondary schools the teacher adjustment described for secondary schools is provided
- For island elementary schools the 10% adjustment to the EPS rate is provided for the K-8 enrollment of these schools
- For Island schools operating on the island there is a 13-26% adjustment to EPS operating and maintenance costs based on the size and level of the school

- For island schools transporting students to mainland schools there is a transportation adjustment equal to approved transportation expenditures.

Before the programs described below are added to the total SAU allocation, the sum of EPS allocations described above is computed and multiplied by 97%. This new, and somewhat reduced figure is the adjusted operating allocation that is carried forward and added to the allocations determined by the balance of programs below.

Gifted and Talented

Gifted and talented programs are funded on an approved program cost basis. SAUs receive funding based on approved expenditures two years prior, adjusted for inflation to one-year prior. These funds are added to the total EPS allocation.

Special Education

Each SAU's allocation for special education is computed through a series of steps. First, a weight of 1.27 (for FY 2013) is applied to each special education student up to a maximum of 15% of an SAU's enrollment. For SAUs with special education counts above 15%, a weight of 1.38 is applied to the additional students.

Additional funds are provided for SAUs with fewer than 20 special needs students as well as for high cost in district pupils (3 times the state wide special education EPS rate), and high cost out of district pupils (4 times the statewide special education EPS rate).

Finally there is an adjustment to ensure the SAU meets maintenance of effort requirements of the Federal Government.

All of these funds are added to the EPS allocation for each SAU.

Vocational Education

Vocational, or Career and Technical Education is funded on the basis of allowable costs. These funds are then added to the SAU's total allocation.

Transportation and Debt Service

Transportation and debt service are not specifically analyzed for this study. However, EPS funding does include resources for both categories. Transportation is funded through a density or combined density and mileage model along with a series of adjustments for out of district special education transportation, vocational education transportation, transportation for homeless students, ferry costs and Island SAU costs. Funds are also provided to help districts purchase school busses. Transportation and debt service are subject to a set of minimums and maximums and then included in an SAU's EPS total allocation.

Debt service is funded as a program cost and added to the SAU total allocation.

All of the above categories are combined to determine an SAU's total combined EPS allocation for each fiscal year. This amount is used to determine the relative state and local funding shares as described in the next section of this chapter.

FUNDING THE EPS ALLOCATION

In the preceding section we described how an individual SAU's EPS allocation is determined. Once the DOE computes that figure, it must be funded through a combination of state and local resources. This section describes how total state and local funding is allocated across SAUs. Total EPS funding for FY 2013 is estimated at $1.995 billion without the state contribution to the teacher retirement system and at $2.171 billion with the state retirement contribution.

To fund the EPS total allocation, Maine uses a foundation strategy whereby each year a state appropriation is made and then a local tax rate established to fund the balance of the total. Each SAU's combination of state and local funds is related to its property wealth per pupil, with property poor SAUs receiving a higher percentage of state funding than more wealthy SAUs. Table 2.5 at the end of this chapter provides a state level summary of the annual funding allocations, relative percentages of state and local funding, and the minimum tax rate for the EPS since the inception of the EPS system in FY 2006.

In the sections that follow we describe the 55% state funding initiative, the computation of the state and local funding shares for individual SAUs, and the minimum state funding requirements for individual SAUs.

The 55% State Funding Initiative

A state initiative passed in 2004 established the state share of education funding at 55% as a property tax relief measure. LD 1, which among other things implemented the EPS funding system – established a goal of reaching the 55% state share by 2008-09, a process that began in 2005-06. While initial progress was made, state funding has yet to match the goal of 55%. As shown in Table 2.5, the state share of the EPS funding reached a total of 52.86% in 2008-09, but has generally declined since then. Computation of the percentage is somewhat confounded by the treatment of state payments for teacher retirement in recent years. If those payments are included in the state share of full EPS funding, then in FY 2012 and FY 2013, the state's share has increased to 49.47% and 50.00% respectively. Absent the retirement contribution the state's share is 45.05% in FY 2012 and 45.61% in FY 2013.

The state-funding share is important because it is a source of considerable discussion and some confusion across the state. It is important to all school officials and to local taxpayers because to the extent that the state does not meet the 55% funding level, local property taxes must make up the difference. It is confusing to many because the actual distribution of funds to SAUs provides state funding in an inverse relationship to local SAU property wealth, hence the actual percentage of state funds received by an individual SAU varies considerably – a subtlety often not understood by local taxpayers.

Because Maine has moved from an available resources driven funding system to one based on an estimate of an adequate level of resources needed for schools, total EPS funding is no longer simply based on what the state has available, but instead local property taxes are needed to make up the difference between the state appropriation and the total EPS allocation – and in many SAUs local taxes are increased more to fund additional services.

All of this factors into policy discussions about the funding system, however the way funds are allocated to SAUs remains the same regardless of the state share. The following section describes the interaction of the state and local funding allocations.

Operation of the Funding System

Once the EPS allocation for the entire state has been computed, it is funded through a combination of state and local revenues. The state share is appropriated by the Legislature through its budget process, while the local required contribution is collected on the basis of an established property tax rate designed to collect the balance of revenues needed to fund the EPS. Table 2.5 shows the tax rates for each year since SY 2006 when the EPS was first implemented. Each SAU's required local contribution is determined by applying the required tax rate to the property value of the SAU to determine the local share. The state effectively makes up the balance of funding – with a few caveats described below.

The process is slightly more complex than this as most SAUs are composed of multiple towns, and individual tax rates must be computed for each town based on the relative share of the SAU funding share allocated to that town. Within a multi-town SAU, the EPS total allocation is assigned to each member town based on the respective percent of the calendar year average resident pupils. This percentage is then used to generate the required local contribution of the town by multiplying the town's state certified valuation times the established mill expectation for the EPS. However, the total raised can not exceed the total town allocation which means that if a town is property wealthy, the tax rate may be reduced once the town's required local contribution has been met (Maine Dept. of Education, 2012).

The distribution is modified by providing a minimum state contribution to each SAU. This minimum is computed at the greater of five percent of the SAU's total allocation (state and local share), or 30% of the SAU's special education adjustment. Once these minimums are computed, the SAUs total state and local share are computed for the current fiscal year. Table 2.5 displays the state level implications of this system.

There are several issues of concern that were described to us in the course of our site visits to Maine in October 2012 and February 2013. These are the focus of the next section of this chapter.

ISSUES AND CONCERNS WITH THE EPS FUNDING SYSTEM

As indicated in Chapter 1, during our visits to Maine in October and February we identified a number of concerns with the current EPS funding system. These issues are outlined below for

the purpose of informing the Legislature of the issues with which we are aware. Since this part of the overall study is designed to be descriptive of Maine's EPS system, we do not offer suggestions for modifying the system in response to these concerns – that will come during the second part of our study where we will work with the Committee, education stakeholders and other interested parties to better understand these issues in the context of the analyses that follow herein. Our second report, due on December 1, 2013 will provide recommendations for changes to the system and rationales for those recommendations. Below we list the major concerns identified to date.

Is the EPS Adequate and Accurate?

Perhaps the primary question this study will address is whether the EPS computations accurately estimate adequate funding levels to enable Maine's school children to achieve the *Learning Results*. We begin to address this issue in Chapter 6 where we compare the EPS to our Evidence-Based model (EBM). Chapter 6 is a detailed comparison of the two models. During Part 2 of this study we will build a simulation model of the EBM, using Maine SAU enrollments and salary levels, to compare what each SAU receives through the EPS with an estimate of what it would receive under the EBM. We will then conduct professional judgment panels and stakeholder meetings to get input into the strengths and weaknesses of both approaches, and to provide alternative suggestions for ways to estimate adequacy.

Of particular concern to many individuals we met with are the adjustments that are part of the EPS calculations. Specific concerns were expressed about the complexity of the special education adjustment, the regional cost adjustment and the reduction of Federal Title I receipts in computing each SAU's total allocation. In addition, several individuals indicated that there are concerns with the adjustments for small schools in the model.

Another concern frequently expressed was the proportion of total K-12 education expenditures that are outside of the EPS system and currently funded completely through local property taxes. We will identify the extent to which this occurs and as part of our comparison of EPS with the EBM, be able to identify the parts of those outside expenditures that might be considered essential to adequate funding, and which are beyond the level of adequacy necessary to meet the *Learning Results*.

At the same time we have been working closely with the Maine DOE to collect the data needed for our analyses and future modeling. To date we have not identified any concerns with accuracy of the computations of the funding formulas, but should such emerge, we will share them with the DOE and work with them to help make any necessary adjustments.

State Share of 55%

As noted above, a voter-approved initiative requires the state to fund 55% of the costs of the EPS system. To date, state funding has not reached that goal, and to some extent the state share has declined in recent years (See Table 2.5). Regardless of whether the state share is fully funded, the relative share of state (generally sales and income tax funded) and local (generally property tax funded) contributions to education funding is of utmost importance. The question includes

both the policy issue of appropriate shares, but also the relative distribution – and hence funding equity – across individual SAUs. The analyses in Chapters 3 and 4 of this report provide national and New England based comparisons showing how other states address this issue along with an analysis of the school finance equity of the current system.

Fiscal Capacity Measure

Throughout our discussions with individuals in Maine, a common concern has been about areas of the state that are property wealthy but have low per capita incomes. Because of Maine's geographic features, it is popular vacation destination and a popular state for ownership of second homes. Thus in many areas of the state property values are quite high, but most year-round residents have relatively low incomes. As a result the residents feel they are unable to afford the high property tax share required of their towns to fully fund the EPS system. Our analysis in Chapter 4 considers this question in more depth, providing equity estimates based on household income as well as property wealth. Once the parameters of this concern are better known, we will work with appropriate officials to consider alternative measures of school district fiscal capacity – and their implications for the funding system – to present in our findings in Part 2 of this report. The minimum EPS allocation currently in place is one way to address the issue of high property wealth and low personal income, however an alternative would be to address the fiscal capacity measure itself. Another approach could be to create a Maine "circuit breaker" on the property tax burden. This could be done by providing income tax relief for high property tax payments, or limiting property taxes to a percent of income, as Vermont has done for many years.

We anticipate additional concerns will emerge as the study progresses. Our intent is to address them as appropriate – and as prioritized by the Committee – as our work continues.

SUMMARY

This chapter has provided a description of the way EPS computes an adequate funding level for each SAU in Maine and explained how tax resources are raised to fund the EPS system. Finally, this chapter described the important concerns and issues that have been identified through our discussions with the Committee, education stakeholders and other interested parties.

Table 2.5: EPS Funding Comparison, FY 2006 to FY 2013

Fiscal Year	Total EPS ($ Millions)	Total EPS w/o Retirement ($ Millions)[a]	Adjusted Operating EPS Allocation ($ Millions) (%)	Local Share ($ Millions)	Local Share Required Tax Rate (Mills)	State Share ($ Millions)	State Share (%)
2005-06	1,786		1,786 (84)	742	8.26	737	46.50
2006-07	1,829		1,830 (90)	783	7.60	914	50.00
2007-08	1,895		1,895 (95)	850	7.44	978	51.60
2008-09	1,860		1,860 (97)	864	6.79	983	52.86
2009-10	1,922		1,923 (97)	918	6.69	952	49.52
2010-11	1,945		1,945 (97)	972	6.98	873	47.80
2011-12	2,145	1,972	1,931 (97)	1,042	7.50	889	45.05b
2012-13	2,171	1,975	1,954 (97)	1,044	7.69	910	45.61b

[a]Only applies to FY 2012 and FY 2013
[b]Share of 100% EPS without retirement
Source: Maine DOE

CHAPTER 3: COMPARATIVE ANALYSIS OF MAINE'S EPS WITH OTHER STATES

As part of this study, a comparative assessment of state school finance systems was conducted. The interstate comparison reviewed data from all 50 states, with an emphasis on data from seven comparative states. The study compared school funding data from Maine with that of other states with a focus on three areas:

1. Educational funding distribution systems
2. Expenditures and student achievement data over the past decade
3. School finance equity in comparison states

To answer these questions, we reviewed data from national and state educational organizations as well as various peer reviewed academic sources.

SELECTING COMPARATIVE STATES

In the description that follows, we provide information on Maine's status both to national averages as well as to a set of seven comparable states. Appendix 1 of this report contains related tables showing similar data for all 50 states. The RFP for this study stated that the other five New England states should be considered "comparable states." In addition, the following criteria (and the sources from which data were analyzed) were used to choose additional states for a detailed comparison:

1. State student enrollment (National Center for Education Statistics [NCES])
2. Number of districts (NCES)
3. Average number of students per district (NCES)
4. Median household income (U.S. Census)
5. Average expenditures per pupil (U.S. Census)
6. Relative tax effort (National Education Association)
7. State/Local/Federal education expenditure proportions (U.S. Census)
8. National Assessment of Educational Progress scores for reading and math in the 4^{th} & 8^{th} grades
9. Graduation rates (U.S. Department of Education)
10. College-going rates (CL Higher Education Center)

We analyzed all states outside of New England to identify those that were within plus or minus five percent of Maine in each of these categories. Two states were within these parameters for at least a third of the categories – they are Iowa and Wisconsin. Like Maine they are smaller mostly rural states that have a historical commitment to funding education. Following discussion with the Committee on February 6, 2013, we determined that Iowa and Wisconsin would be added to the list of states for which detailed comparative analyses would be conducted, for a total of seven states including the other five in New England (Connecticut, Massachusetts, New Hampshire, Rhode Island and Vermont.

EDUCATION FUNDING DISTRIBUTION SYSTEMS

General Funding Formulas

Each of the 50 states employs a unique system for allocating funds to local education agencies. These systems are developed in various ways and take into account state specific political and historical factors. These factors include political decisions, fiscal constraints and judicial mandates. While each state's funding system is unique, it is possible to place these funding systems into general categories for comparative purposes. A recent study by Deborah Verstegen (2011) at the University of Nevada, Reno put each of the 50 states' systems into one of four general funding categories:

1. *Foundation formula* (38 states) – Foundation formulas establish a guaranteed per pupil or per teacher funding level that is theoretically designed to pay for a basic or minimum education program. Local education agencies are required to contribute to the foundation amount - usually through a uniform tax rate. The state makes up the difference between local funding and the total foundation amount (for more details see Odden & Picus, 2014). In some states this system is known as a base or guaranteed funding system.

2. *District power equalization* (3 States) – District power equalization, frequently called a guaranteed tax base, is designed to provide state funding matches to local educational agencies based on their relative wealth. Theoretically this type of formula functions by guaranteeing an equal tax base to every local education agency in the state. Verstegen (2011) assigns Vermont, Connecticut and Wisconsin to this category.

3. *Full state funding* (1 state) – The state of Hawaii operates as a single school district, and because of this 100% of school funding comes from state sources.

4. *Combination of formulas* (8 states) – Eight states use a combination of a foundation formula, power equalization formula, flat grants and/or other types of funding methods. These systems are often referred to as two-tier or multi-tier systems. A common approach is a first tier foundation level followed by a second tier of optional funding supported through guaranteed tax base or percentage power equalization.

It should be noted that it is difficult, if not impossible, to place each state's funding system into a single category - Maine's funding system is an example of this. This study defines the Maine system as using a foundation formula. However, components of the other approaches can be found in some of the distribution formulas used by the state to distribute funds to SAUs.

Funding Special Student Populations

States often provide supplementary funding to local school districts for certain student populations that may require additional resources to meet their educational needs. This can include students enrolled in special education, students who are identified as at-risk or low income, and English language learners. All fifty states provide some additional funding for

special education students. Thirty-four states provide additional funding for at-risk student populations – usually defined as low-income students who qualify for free/reduced priced lunch programs. Thirty-seven states provide additional funds for educating students who do not speak English as their first language.

Common approaches for funding special student populations include:

- Categorical grants provided to meet the educational needs of these students
- Pupil weights for specific student groups
- Reimbursement of program expenditures

As detailed in Chapter 2, Maine's education funding system relies on a variation of a foundation formula that provides additional funding for special education, at-risk and ELL students. The approach used by Maine and each of the comparative states is summarized in Table 3.1. Important comparisons from this table include:

- Four of the comparative states use a variation of the foundation formula to distribute revenues to school districts - the other three states make use of a power equalization formula
- While their systems may vary, all seven comparative states provide additional funding for special education students
- All seven comparative states provide additional funding for at- risk students
- Of the seven comparative states only Rhode Island does not provide additional funding for English Language Learner (ELL) students
- New Hampshire provides additional funding for student transportation through their primary formula while Connecticut, Maine and Massachusetts provide transportation funding outside of the formula, and Rhode Island provides no additional funding for transportation
- All seven other states provide some form of capital funding to districts outside of their primary funding formula

Table 3.1: Summary of education funding systems across comparative states

State	Funding Formula	Special Education	At-Risk	English Language Learners
Maine	Foundation	Reimbursement based on costs	15% additional funding per student	50% to 70% additional funding based on student enrollment
Connecticut	Power Equalization	Additional funding only for high need students	33% additional funding per student	Grants to districts with 20 or more ELL students. All other ELL students – 15% additional funding.
Iowa	Foundation	Additional funding 80% to 340% per student based on student's disability. Also, cost reimbursement for high-cost students.	Identified students receive an additional weight of .00156. Students enrolled in grades 1-6 receive an additional weight of .0048	22% additional funding per student
Massachusetts	Foundation	Based on census and also for high need students	Identified students receive a set dollar amount that is updated annually for inflation. For FY 2013: Low-income elementary - $3,341.30 *Low-income secondary - $2,701.97*	ELL students receive a higher foundation amount based on previous expenditures.
New Hampshire	Foundation	53.8% additional funding per student	19.57% additional funding per identified student	50% additional funding per student
Rhode Island	Foundation	Additional funding only for high need students (5X above the base)	40% additional funding per identified student	No additional funding
Vermont	Power Equalization	Census and reimbursement based funding along with additional funding for high-cost students	25% additional funding per identified student	20% additional funding to each ELL student
Wisconsin	Power Equalization	Reimbursement based on costs	Eligible schools receive additional state aid of up to $2,250 for each identified low-income K-3 child. At risk funding for students in grades 5-12 was discontinued in 2011	Funded as a categorical program outside of the primary formula. Districgs are provided reimbursements for a percentage of allowable costs

Sources: Funding formulas: (Verstegen, 2011); At-risk funding: (Griffith, Workman &Workman, 2013); Special education and English language learner funding: State legislation.

TRANSPORTATION AND CAPITAL COSTS

Two programs that are generally funded outside of a state's primary funding formula are transportation and capital expenditures. The approaches used by Maine and the seven comparison states are displayed in Table 3.2.

General Education Transportation Funding

Maine funds the transportation of general education students by providing a per pupil allocation to districts based on previous expenditures determined by a formula outside of the primary EPS formula, and provides subsidies to help districts purchase new school busses.[7] Of the other 49

[7] Maine Statute: Other *Subsidizable Costs*: Article 20-A, section 15681-A(3).

states, 10 address transportation costs within the primary formula, while three provide no general education transportation funding to districts. The remaining 36 states address this issue outside of the primary formula because transportation needs vary so greatly across districts. Tennessee is the only state that funds transportation both in the primary formula and through a funding adjustment that is outside the formula. Some states provide no transportation funding for the general education population but provide other types of transportation funding. For example, Rhode Island provides transportation funding to districts for students educated in private education programs that are located outside of the district or for students educated in regional district programs. However, the state does not provide transportation funding for general education students educated within the district. The various systems that states use to allocate transportation costs outside of the primary formula include:

- Allowable reimbursement (16 states) – The state reimburses districts for a percentage of allowable transportation expenses
- Density formulas (8 states) – The state funds districts based on the number of district students per square mile
- Per pupil (5 states) – The state provides funding to each district based on a set amount per pupil
- Full reimbursement (5 states) – The state reimburses each district the full cost of allowable transportation expenses
- Equalized reimbursements (3 states) – The state provides a reimbursement to districts that are equalized based on their relative wealth

Transportation costs are generally reimbursed on the basis of mileage, hours of operation or a combination of the two.

Capital Costs

States typically address capital costs outside of the primary formula. In Maine, SAUs are reimbursed for allowable capital and lease costs based on their relative property wealth. Twelve states provide no funding for capital costs. Of the remaining 38 states – six states use their primary formula to fund capital costs, four states use a combination of funding from their primary formula and other funding sources outside of the formula and the remaining 28 states use one or more funding programs outside the primary formula. The various types of funding that exist outside the formula are:

- Approved project grants (13 states)
- Equalized project grants (10 states)
- Equalized debt service (6 states)
- State bond guarantees (5 states)
- Subsidized loans to school districts (4 states)
- Debt service grants to school districts (2 states)

Table 3.2: General Education Transportation and capital expenditures across comparative states

State	Transportation	Capital Costs
Maine	Bus purchase costs along with a per pupil amount based on previous expenditures	Equalized reimbursements
Connecticut	Equalized reimbursements	Equalized project grants
Iowa	Through the primary formula	Debt service and capital grants to districts based on student enrollment and need
Massachusetts	Full-cost reimbursements	Approved project grants, state bond guarantees and equalized debt service grants
New Hampshire	Through the primary formula	Equalized project grants
Rhode Island	None	Equalized project grants
Vermont	Allowable reimbursement	All non-emergency capital funding has been suspended
Wisconsin	Funded on a per pupil basis	Through the primary formula

STATE FUNDING COMPARISONS

In this section of Chapter 3 we compare education funding in Maine to all 50 states along with a more in-depth analysis of how Maine compares to the seven other comparison states. Educational expenditure and demographic data for all 50 states for fiscal years 1999-2000 and 2009-10 are provided in the appendices while data for Maine and the seven comparison states are detailed below.

Educational Revenues and Expenditures

Total K-12 Revenues

A review of data from the United States Census Bureau (U.S. Census) shows that from fiscal year 1999-2000 to 2009-10 state and local revenue for public K-12 education in Maine grew from $1.62 billion to $2.35 billion - an increase of just over $728.6 million or 45%.[8] During this same time period, state and local revenue for K-12 education in all 50 states increased by 49.4% ($171.6 billion). In the seven comparative states, local and state revenue for education increased at the rate of 47.9% ($14.7 billion) or slightly faster than spending increased in Maine. Table 3.3 shows these changes for Maine and the seven comparative states. It is important to note that the rate of increase in revenues was lower in Iowa and Wisconsin than any of the New England states. The average rate of growth in the five other New England States during this time frame was 57.7%, substantially more than Maine's 45%. Data for all 50 states is in Appendix 3A

[8] Note that this figure includes all K-12 state and local education expenditures and thus is higher than the EPS funding data reported in Table 2.5 above.

Table 3.3: Growth in Local & State Revenue for K-12 Education

	State and Local K-12 Revenue		Change from FY 1999-2000 to FY 2009-10	
	FY 1999-2000	FY 2009-10	In Dollars	In Percentages
National	$347,289,182,000	$518,928,241,000	$171,639,059,000	49.42%
Comparative States	$30,733,354,000	$45,465,866,000	$14,732,512,000	47.94%
Maine	$1,619,065,000	$2,347,668,000	$728,603,000	45.00%
Connecticut	$5,552,489,000	$8,725,670,000	$3,173,181,000	57.15%
Iowa	$3,476,798,000	$4,805,126,000	$1,328,328,000	38.21%
Massachusetts	$8,911,326,000	$13,690,358,000	$4,779,032,000	53.63%
New Hampshire	$1,473,057,000	$2,618,266,000	$1,145,209,000	77.74%
Rhode Island	$1,376,037,000	$1,946,128,000	$570,091,000	41.43%
Vermont	$881,626,000	$1,398,604,000	$516,978,000	58.64%
Wisconsin	$7,442,956,000	$9,934,046,000	$2,491,090,000	33.47%

Source: United States Census Bureau. Annual Report: *Public Education Finances: 2002-2012*.

Per Student Expenditures

As shown in Table 3.4, in FY 1999-2000 Maine's average per pupil expenditure was $7,595, ranking 12th highest in the nation – $759 or 11.1% above the national average of $6,836 per pupil. In 2009-10 Maine's average per pupil expenditure grew to $12,259, which was $1,659 or 15.6% above the national average of $10,600. That year, Maine's per pupil spending ranked 12th nationally – just as it had in 1999-2000. In 2009-2010 in the other seven comparative states, spending ranged from $9,763 per pupil in Iowa to $15,274 in Vermont.

From fiscal year 1999-2000 to 2009-10 Maine's per pupil expenditures for public primary and secondary schools increased by $4,664 or 61.4%. Maine's percentage spending growth was the 21st highest in the nation. Nationally, average spending per pupil increased by $3,764 or 55.1%. If Maine's per pupil spending had grown at the national average, spending in 2009-2010 would have been $11,780 per pupil – or $479 less than the actual spending level. In the other seven comparative states per student expenditure increases ranged from 47.3% in Wisconsin to 92.4% in Vermont. Details of these changes are displayed in Table 3.4 for Maine and the comparison states and in Appendix 3.B for all 50 states.

Table 3.4: Growth in Per-Pupil Spending

	Per Pupil Expenditures *(National Rank)*		Growth in Expenditures *(National Rank)*	
	1999-2000	**2009-2010**	**In Dollars**	**In Percentages**
National	$6,836	$10,600	$3,764	55.10%
Maine	$7,595 (12)	$12,259 (12)	$4,664 (15)	61.4% (21)
Connecticut	$8,800 (3)	$14,906 (6)	$6,106 (7)	69.4% (10)
Iowa	$6,547 (23)	$9,763 (25)	$3,216 (31)	49.1% (36)
Massachusetts	$8,444 (5)	$13,590 (9)	$5,146 (13)	60.9% (22)
New Hampshire	$6,742 (22)	$12,383 (10)	$5,641 (8)	83.7% (6)
Rhode Island	$8,242 (6)	$13,699 (8)	$5,457 (9)	66.2% (14)
Vermont	$7,938 (8)	$15,274 (4)	$7,336 (3)	92.4% (2)
Wisconsin	$7,716 (10)	$11,364 (16)	$3,648 (24)	47.3% (40)

Source: United States Census Bureau. Annual Report: *Public Education Finances*: 2002 – 2012.

State Financial Commitment to Education

In comparing per pupil expenditures across states it is important to ask how "hard" a state works to reach its spending level. One approach for estimating the level of effort a state exerts to fund K-12 education is to analyze K-12 education expenditures per $1,000 of personal income. In Maine, state and local spending for K-12 education in 2009-10 (the most recent year for which data are available) was $50 per $1,000 of personal income, seventh highest in the nation. The national average in 2009-10 was $41 per $1,000 of income, a figure that was unchanged from 1999-2000. In the other comparative states in 2009-10, effort ranged from $40 in Iowa to $61 in Vermont. Table 3.5 provides detailed findings for Maine and the seven comparison states. Data for all 50 states are in Appendix 3.C.

Another way to assess a state's fiscal commitment to education is to determine the percentage of the state's budget devoted to K-12 public schools. During the 2010-11 fiscal year (the most recent year for which data are available) K-12 expenditures accounted for 13.7% of total state expenditures in Maine while the national average was 20.2%. Only five states had amounts that were lower than Maine (see Appendix 3.D). The percentage of Maine's budget going to K-12 education has varied considerably since 1999-2000, from a high of 20.4 % in 2000-01- to a low of 13.7% in 2002- 03 (National Association of State Budget Officers, 2012). Table 3.6 summarizes the share of each comparative state's budget devoted to K-12 education in 1999-2000 and 2010-2011. Similar data for all 50 states is in Appendix 3.D

Table 3.5: K-12 Spending Per $1,000 of Income

	K-12 Spending per $1,000 of (National Rank)		Change in Expenditures (National Rank)	
	1999-2000	2009-2010	In Dollars	In Percentages
National	$41	$41	$0	$0
Maine	$46 (9)	$50 (7)	$4 (12)	8.7% (15)
Connecticut	$42 (22)	$43 (20)	$1 (19)	2.4% (22)
Iowa	$44 (16)	$40 (31)	-$4 (42)	-9.1% (43)
Massachusetts	$36 (44)	$43 (20)	$7 (7)	19.4% (5)
New Hampshire	$37 (38)	$45 (14)	$8 (5)	21.6% (4)
Rhode Island	$41 (23)	$53 (4)	$12 (1)	29.3% (1)
Vermont	$53 (2)	$61 (3)	$8 (5)	15.1% (8)
Wisconsin	$48 (5)	$46 (10)	-$2 (33)	-4.2% (34)

Source: National Association of State Budget Officers. *Annual Report: State Expenditure Report*: *2002-2012*

Table 3.6: State K-12 Expenditures as a Percent of Total State Expenditures

	K-12 Expenditures as a % of total state expenditures (National Rank)		Change in Expenditures (National Rank)
	1999-2000	2010-2011	
National	22.50%	20.20%	-2.30%
Maine	19.9% (26)	13.7% (45)	-6.2% (41)
Connecticut	13.9% (48)	14.2% (44)	0.3% (15)
Iowa	19.7% (27)	17.7% (28)	-2.0% (28)
Massachusetts	14.4% (47)	11.6% (46)	-2.8% (33)
New Hampshire	28.7% (5)	22.3% (16)	-6.4% (43)
Rhode Island	16.6% (46)	14.4% (43)	-2.2% (29)
Vermont	20.5% (25)	31.9% (2)	11.4% (1)
Wisconsin	19.5% (29)	17.3% (30)	-2.2% (30)

Source: National Association of State Budget Officers. *Annual Report:* State Expenditure Report: 2002-2012

Factors That Drive Educational Expenditures

There are multiple factors that can influence the change in the level of education spending in an individual state. These include: changes in the size of the state's student population; increases in teacher/staff compensation; growth in the number of teachers/staff; and, increases in costs that are outside of the state or districts' control (e.g. fuel and energy costs or health care). A number of these issues have impacted Maine.

Student Population

Over the past decade Maine has experienced a substantial decrease in its K-12 student population. Between 2001-2002 and 2011-12, Maine's K-12 public school population decreased 10% from 205,586 to 185,033 (NEA, 2012)– a decrease of 20,553 students. This was the 4th largest percentage decrease in state enrollment in the nation. During this same time period the national K-12 public school population increased by 3.9% while overall, the student population in New England shrank by 5.3%. Table 3.7 displays these changes and Appendix 3.E displays similar data for all 50 states.

While the state's student population was shrinking, the number of school districts remained relatively stable. As a result, Maine's average district size decreased by 78 students or 8.8%. For the 2010-11 fiscal year Maine had the 4th smallest average district size in the country at 808 students per district. Data on comparable states and the National Average school district size is displayed in Table 3.8 and in Appendix 3F.

Table 3.7: Student Population Changes

	Total Student Enrollment		**Change in Enrollment *(National Rank)***	
	2001-2002	**2011-2012**	**In Students**	**In Percentages**
National	47,301,299	49,137,726	1,836,427	3.90%
New England	2,213,938	2,096,983	-116,955	-5.30%
Comparative States	3,579,231	3,464,097	-115,134	-3.20%
Maine	205,586	185,033	-20,553 (43)	-10.0% (47)
Connecticut	569,540	554,398	-15,142 (41)	-2.7% (38)
Iowa	485,932	496,009	10,077 (27)	2.1% (23)
Massachusetts	973,142	952,370	-20,772 (44)	-2.1% (37)
New Hampshire	206,847	190,931	-15,916 (42)	-7.7% (43)
Rhode Island	157,956	137,175	-20,781 (45)	-13.2% (49)
Vermont	100,867	77,076	-23,791 (46)	-23.6% (50)
Wisconsin	879,361	871,105	-8,256 (37)	-0.9% (35)

Source: National Education Association. Annual Report: *Rankings and Estimates*, 2000 through 2012

Table 3.8: Average School District Sizes

	Average District Size (National Rank)	
	2001-2002	2011-2012
National	3,121	3,178
New England	1,731	1,584
Comparative States	1,724	1,650
Maine	886 (45)	808 (47)
Connecticut	2,951 (26)	2,786 (27)
Iowa	1,310 (42)	1,413 (42)
Massachusetts	2,609 (28)	2,381 (29)
New Hampshire	1,277 (43)	1,186 (45)
Rhode Island	4,388 (16)	2,799 (26)
Vermont	356 (49)	269 (50)
Wisconsin	2,064 (36)	2,054 (33)

Source: National Education Association. Annual Report: *Rankings and Estimates,* 2000 through 2012

Teacher Staffing

Data collected by the National Center for Education Statistics show that salaries and benefits of all employees account for just over 80% of all public school expenditures. The majority of these total compensation expenses can be traced to teaching positions. Consequently, increases in teacher pay or benefits and/or increases in the number of teachers employed in a state can drive up total educational expenditures.

In 2011-12, Maine's average teacher salary of $47,338 was 14.6% lower than the national average of $55,418. In 2001-2002 average teacher salaries in Maine were $37,300 or 16.4% lower than the national average of $44,632. Between 2001-2002 and 2011-12 Maine's teacher salaries grew by $10,038 or 26.9% while the national average teacher salary during that time grew by $10,786 for an increase of 24.2%%. These data are displayed in Table 3.9 and Appendix 3G.

Table 3.9: State Average Teacher Salaries

	Average Teacher Salaries (National Rank)		Salary Increases (National Rank)	
	2001-2002	2011-2012	In Dollars	In Percentages
National	$44,632	$55,418	$10,786	24.2%
Maine	$37,300 (37)	$47,338 (38)	$10,038 (27)	26.9% (20)
Connecticut	$53,551 (2)	$69,465 (3)	$15,914 (4)	29.7% (14)
Iowa	$38,230 (33)	$50,240 (25)	$12,010 (17)	31.4% (11)
Massachusetts	$49,242 (10)	$71,721 (2)	$22,479 (1)	45.7% (2)
New Hampshire	$40,002 (25)	$54,177 (18)	$14,175 (7)	35.4% (7)
Rhode Island	$49,758 (7)	$62,186 (8)	$12,428 (15)	25.0% (31)
Vermont	$39,158 (31)	$51,306 (23)	$12,148 (16)	31.0% (13)
Wisconsin	$42,232 (21)	$53,792 (20)	$11,560 (21)	27.4% (19)

Source: National Education Association. Annual Report: *Rankings and Estimates,* 2000 through 2012

In Maine from 2000-2001 to 2010-11 the number of full-time equivalent (FTE) teaching positions decreased by 1,175, or 7.1%. Nationally the number of teachers increased by 5.4% while in the comparison states they increased by 0.4%. The number of teaching positions in Maine did not decrease at the same rate as the decrease in the number of students (10%). This has led to a slight reduction in the student to teacher ratio from 12.5 to 1 in 2000-2001 to 12.3 to 1 in 2010-11 (NCES, 2012). Nationally, average student to teacher ratio in 2010-11 was 16 to 1 and the average in the comparative states was 13.8 to 1 in that same year.

Between 2000-01 and 2010-11 Maine also saw a decrease of 26 administrators. This is a decrease of 2.9%. For the same period, the national average increase was 16.4% and the increase for the comparative states was 8.5% (NCES, 2012). These data are displayed in Table 3.10 and in Appendix 3.J.

Table 3.10: Teacher & Administrator to Student Ratios

	Teacher to Student Ratios (National Rank)		Administrators to Student Ratios (National Rank)	
	2000-2001	2010-2011	2000-2001	2010-2011
National	16.0	16.0	332.9	299.8
New England	14.0	13.2	301.0	242.4
Comparative States	14.2	13.8	299.0	269.5
Maine	12.5 (2)	12.3 (3)	229.5 (4)	215.8 (5)
Connecticut	13.7 (8)	13.1 (9)	272.5 (12)	263.5 (14)
Iowa	14.3 (15)	14.3 (19)	233.6 (5)	284.9 (22)
Massachusetts	14.5 (17)	13.9 (15)	316.3 (27)	218.1 (6)
New Hampshire	14.5 (17)	12.7 (5)	384.6 (43)	384.8 (44)
Rhode Island	14.8 (20)	12.8 (7)	465.5 (48)	318.1 (35)
Vermont	12.1 (1)	11.6 (2)	242.4 (7)	198.5 (2)
Wisconsin	14.6 (19)	15.1 (29)	347.8 (35)	356.5 (40)

Sources: Teacher data and administrator data – National Center for Education Statistics, 2000 through 2012.

Federal Education Spending

From 1999-2000 to 2009-2010 federal funding for K-12 education in Maine grew from 6.1% to 12% of the total. Nationally during this time frame federal sources increased from 7.1% to 12.5% of total K-12 education spending. The increased reliance on federal funding for education can be traced to two developments. First, in 2009 the federal government passed the American Recovery and Reinvestment Act that pumped an additional $70 billion into K-12 education between 2008-2009 and 2011-12 (Education Commission of the States, 2009). At the same time most states decreased their own financial commitment to K-12 education. These two factors combined to more than double the percentage of funds that are derived from federal sources. For a state-by-state breakdown see Table 3.11 and Appendix 3.L.

The overwhelming majority of Maine's federal funding for K-12 education (77.3%) comes from two programs, the Individuals with Disability Act (IDEA) and Title I. For a detailed breakdown of K-12 federal funding in Maine during the 2012-2013 school year see Table 3.12.

Table 3.11: K-12 Funding From Federal Sources

	Percentage of K-12 Funding From Federal Sources (National Rank)	
	1999-2000	2009-2010
National	7.10%	12.50%
Maine	6.1% (36)	12.0% (30)
Connecticut	4.0% (48)	8.6% (42)
Iowa	5.9% (37)	13.2% (25)
Massachusetts	5.1% (43)	7.4% (46)
New Hampshire	3.6% (50)	6.6% (50)
Rhode Island	5.6% (39)	11.3% (33)
Vermont	6.9% (26)	11.0% (35)
Wisconsin	4.6% (47)	10.1% (41)

Table 3.12: A Breakdown of Maine's Federal K-12 Funding

Program	Total Funding 2012-2003	As a Percentage of Federal Funding
Total Federal Funding	$137,214,210	
IDEA – Special Ed. Grants to States	$54,641,460	39.80%
Title I – Grants to Local Education Agencies with Low-Wealth Students	$51,434,777	37.50%
Title II – Effective Teacher & Leaders State Grants	$8,590,184	6.30%
Career and Tech. Education State Grants	$5,020,515	3.70%
Assessing Achievements – Grants for improving state assessments	$3,815,260	2.80%
IDEA – Preschool Grants	$2,464,997	1.80%
IDEA – Grants for Infants & Families	$2,254,984	1.60%
Impact Aid – Aid to districts that have lost property tax revenue due to the presence of tax-exempt Federal property	$2,014,831	1.50%
School Improvement State Grants	$1,789,404	1.30%
Rural & Low-Income School Programs	$1,306,065	1.00%
Small, Rural School Achievement Program	$1,236,769	0.90%
Migrant Student State Grants	$1,211,044	0.90%
English Language Learner Grants	$720,005	0.50%
Neglected & Delinquent Children & Youth	$230,473	0.20%
Homeless Children & Youth	$226,815	0.20%
Indian Student Education – Grants to LEAs	$151,895	0.10%
Impact Aid for Children with Disabilities	$104,732	0.10%

Source: United States Department of Education

EDUCATIONAL OUTCOMES

Overall, Maine's students do well on standardized tests compared to students in the United States, although the state's performance is about average among the seven comparative states. Below we show how Maine compares on the National Assessment of Educational Progress (NAEP) and the New England Common Assessment Program (NECAP).

National Assessment of Educational Progress

The National Assessment of Educational Progress (NAEP*)* assessments have been administered periodically to students in reading, mathematics, science, writing, U.S. history, civics, geography, and other subjects since 1969 (NCES 2011). Federal law now requires all states that receive Title I funds – which currently includes all 50 states – to participate in NAEP reading and mathematics assessments at fourth and eighth grades (NAEP, 2011). As a result, comparable fourth and eighth grade math and reading NAEP results are available for all states for the 2003, 2005, 2007, 2009 and 2011 assessments.

NAEP - Scale Scores

Cross state comparisons using NAEP data can be made using average scale scores or student achievement levels. When reviewing Maine's average scale scores on the NAEP math and reading exams for the 4th and 8th grade there are some positive conclusions and some areas where the results suggest more can be done. Overall, a review of NAEP scores from 2003-2011 show:

Positives:

- In every year reviewed, Maine's math and reading scores were above the national average
- Maine's scores in reading and math never ranked lower than 20th nationally
- Maine's test scores for math in the 4th and 8th grades improved from 2003 to 2011
- 8th grade reading scores in Maine consistently ranked in the top ten nationally

Areas of Concern:

- Maine's average scale scores showed mixed results from 2003 to 2011:

	2003	2011
• Math 4th grade:	238	244
• Math 8th grade:	282	289
• Reading 4th grade:	224	222
• Reading 8th grade:	268	270

- 4th grade reading scores in Maine declined between 2003 to 2011 – from 224 to 222
- In 2011 Maine was ranked 5th out of the 8 comparison states in 4th and 8th grade math and 4th grade reading and ranked 6th out of 8 in 8th grade reading

NAEP – Student Achievement Levels

NAEP student test results are divided into four different student achievement levels – advanced, proficient, basic and below basic. These performance standards are set by the National Assessment Governing Board and provide a context for interpreting student performance on NAEP, based on recommendations from panels of educators and members of the public (NAEP, 2011). For comparison purposes this study reviewed NAEP student test results that were at or above basic and at or above proficient. Table 3.13 shows the results for Maine's students between 2003 and 2011.

Table 3.13: Summary of Maine's Reading and Math NAEP results, 2003 to 2011 Percent of Students Who Scored At or Above Basic and Proficient

	Percent of Students Scoring At or Above Basic				
	2003	**2005**	**2007**	**2009**	**2011**
Math - 4th grade	83%	84%	85%	87%	87%
Math – 8th grade	75%	74%	78%	78%	78%
Reading – 4th grade	70%	71%	73%	70%	70%
Reading – 8th grade	79%	81%	83%	80%	80%

	Percent of Students Scoring At or Above Proficient				
	2003	**2005**	**2007**	**2009**	**2011**
Math - 4th grade	34%	39%	42%	45%	45%
Math – 8th grade	34%	39%	42%	45%	45%
Reading – 4th grade	36%	35%	36%	35%	32%
Reading – 8th grade	37%	38%	37%	35%	39%

In 2011 Maine had a higher percentage of students score at or above basic and proficient in 4th and 8th grade math and 8th grade reading than the national average. For the 2011 NBAEP exam, the only time that Maine did not finish above the national average was for students performing at or above proficient in 4th grade math. However, the percentage of students who scored at or above basic and proficient was consistently higher in Massachusetts, a state with a much higher at-risk population, than in Maine.

Table 3.14 Maine's Math and Reading NAEP Results Compared to Massachusetts and the National Average

	Percent of Students At or Above:	Maine	National	Massachusetts
Math 4th Grade	Basic	87%	82%	93%
	Proficient	45%	40%	58%
Math 8th grade	Basic	78%	72%	86%
	Proficient	45%	34%	58%
Reading 4th grade	Basic	70%	68%	83%
	Proficient	32%	32%	50%
Reading 8th grade	Basic	80%	75%	84%
	Proficient	39%	32%	46%

Table 3.15 provides more detail on how Maine students did on the NAEP and compares Maine's result to both the comparative states, and to national outcomes. It is important to point out that the percent of students at or above proficient on the NECAP in Maine is higher than the percent at or above proficient on NAEP which suggests that the cut off point on NECAP is at a lower level of proficiency, or that NAEP has established a higher bar for proficient.

Table 3.15: Maine NAEP results along with Comparative State and National Averages, Math and Reading NAEP Scale Scores 2003 to 2011

Math 4th Grade	Maine Scores			National Average
Year	Average	National Ranking	Comparative State Ranking	Scores
2003	238	15	6	234
2005	241	16	5	237
2007	242	19	7	239
2009	244	9	5	239
2011	244	14	5	240
Math 8th Grade	**Maine Scores**			**National Average**
Year	**Average**	**National Ranking**	**Comparative State Ranking**	
2003	282	15	5	276
2005	281	23	6	278
2007	286	12	4	280
2009	286	19	6	282
2011	289	13	5	283
Reading 4th Grade	**Maine Scores**			**National Average**
Year	**Average**	**National Ranking**	**Comparative State Ranking**	
2003	224	7	5	216
2005	225	9	5	217
2007	226	11	5	220
2009	224	18	5	220
2011	222	20	6	220
Reading 8th Grade	**Maine Scores**			**National Average**
Year	**Average**	**National Ranking**	**Comparative State Ranking**	
2003	268	7	4	261
2005	270	3	2	260
2007	270	5	3	261
2009	268	13	5	262
2011	270	11	5	264

New England Common Assessment Program

Maine, New Hampshire, Rhode Island and Vermont have worked together to develop grade level expectations (GLE) for students in math, reading, writing and science. To test how well students are achieving these GLEs – and to fulfill the requirements of the federal 'No Child Left Behind' legislation - the states developed the New England Common Assessment Program (NECAP).

There are currently NECAP exams for math (grades 3-8 & 11), reading (grades 3-8 & 11), writing (grades 5, 8 & 11) and science (grades 4, 8 & 11). Maine began to participate in NECAP in 2009, and now uses NECAP to test students in math (grades 3-8), reading (grades 3-8) and writing (grades 5 & 8). Student test results are placed into four different categories: Proficient with distinction, proficient, partially proficient and substantially below proficient. Reviewing the test results over the past five years some patterns emerge (See Tables 3.16 and 3.17):

- Maine's test scores have remained flat over the past three years with the exception of 8th grade writing which saw an increase in the percentage of students testing at or above proficient from 53% to 58%
- In 2012 students in New Hampshire and Vermont had a higher level of proficiency than Maine in Math, and Writing at all grade levels and Reading in all but the 3rd grade

Table 3.16: New England Common Assessment Program Results for Maine Students who scored at or above proficient

	Grade Level	2009	2010	2011	2012	Change in Scores From 2010 to 2012
Math	3rd	62%	61%	64%	62%	1%
	4th	62%	66%	66%	66%	0%
	5th	64%	60%	64%	62%	2%
	6th	63%	63%	65%	64%	1%
	7th	60%	58%	61%	59%	1%
	8th	58%	59%	60%	61%	2%
Reading	3rd	73%	69%	72%	68%	-1%
	4th	67%	68%	70%	69%	1%
	5th	72%	70%	68%	71%	1%
	6th	69%	72%	72%	71%	-1%
	7th	68%	66%	70%	69%	3%
	8th	69%	73%	77%	76%	3%
Writing	5th		43%	41%	45%	2%
	8th		53%	51%	58%	5%

Source: Maine Department of Education, Accessed on February 2013: http://www.maine.gov/education/necap/results.html

Table 3.17: 2012 NECAP Results for Math, Reading & Writing – Students Scoring At or Above Proficient

	Grade Level	Maine	New Hampshire	Rhode Island	Vermont
Math	3rd	62%	*74%*	**60%**	*65%*
	4th	66%	*77%*	**65%**	*68%*
	5th	62%	*74%*	62%	*65%*
	6th	64%	*74%*	**62%**	*68%*
	7th	59%	*69%*	59%	*61%*
	8th	61%	*68%*	*68%*	*64%*
Reading	3rd	68%	*78%*	*70%*	68%
	4th	69%	*78%*	69%	*70%*
	5th	71%	*77%*	*72%*	*72%*
	6th	71%	*79%*	*73%*	*73%*
	7th	69%	*77%*	*70%*	*74%*
	8th	76%	*82%*	*77%*	*80%*
Writing	5th	45%	*58%*	*59%*	*51%*
	8th	58%	*67%*	*65%*	*66%*

Numbers in italics represent results higher than Maine, bold results are lower than Maine and standard black equal to Maine.
Sources: State departments of education web sites.

Other Educational Measures

There are other ways to measure student achievement in addition to the use of student test scores. Comparisons of graduation rates, for example, show that the percentage of students who graduated from Maine high schools within four years in the 2008-09 school year (the most recent available) was 79.9% (NCES, 2011). Maine's 2008-2009 graduation rate was 4.4 percentage points higher than the national average and 17th highest in the country. Between 2001-02 and 2008-09 Maine's high school graduation rate improved by 4.3 percentage points. Table 3.18 shows the high school graduation rates for Maine and other comparable states. Data for all 50 states are in Appendix 3.M.

Another frequently used approach for measuring student performance is the number of high school graduates who enroll in college – this is commonly known as the "college going rate." The college going rate measures the number of students who graduate from high school and begin college in the fall of the next school year. Maine's college going rate for 2007-08 was 57.1%, which was the 11th lowest in the country.[9] The national college going rate for that year was 63.3%. Because of the way that this number is measured states that have a low high school graduation rate often have high college going rates due to the fact that high school dropouts are not part of the equation. For this reason Mississippi, which had the 3rd lowest high school graduation rate at 63.9%, had the highest college going rate in the country at 77.4%.

[9] Calculated by the CL Higher Education Center using data from the U.S. Department of Education.

Table 3.18: High School Graduation Rates –
Average freshmen four-year graduation rates

	Graduation Rates (National Rank)		Changes in Rates (National Rank)
	2001-2002	2008-2009	
National	72.60%	75.50%	2.90%
Maine	75.6% (24)	79.9% (17)	4.3% (16)
Connecticut	79.7% (12)	75.4% (28)	-4.3% (49)
Iowa	84.1% (4)	85.7% (5)	1.6% (32)
Massachusetts	77.6% (16)	83.3% (8)	5.7% (13)
New Hampshire	77.8% (15)	84.3% (7)	6.5% (10)
Rhode Island	75.7% (23)	75.3% (30)	-0.4% (41)
Vermont	82.0% (7)	89.6% (2)	7.6% (6)
Wisconsin	84.8% (3)	90.7% (1)	5.9% (12)

Source: National Center for Education Statistics, 2000 through 2011.

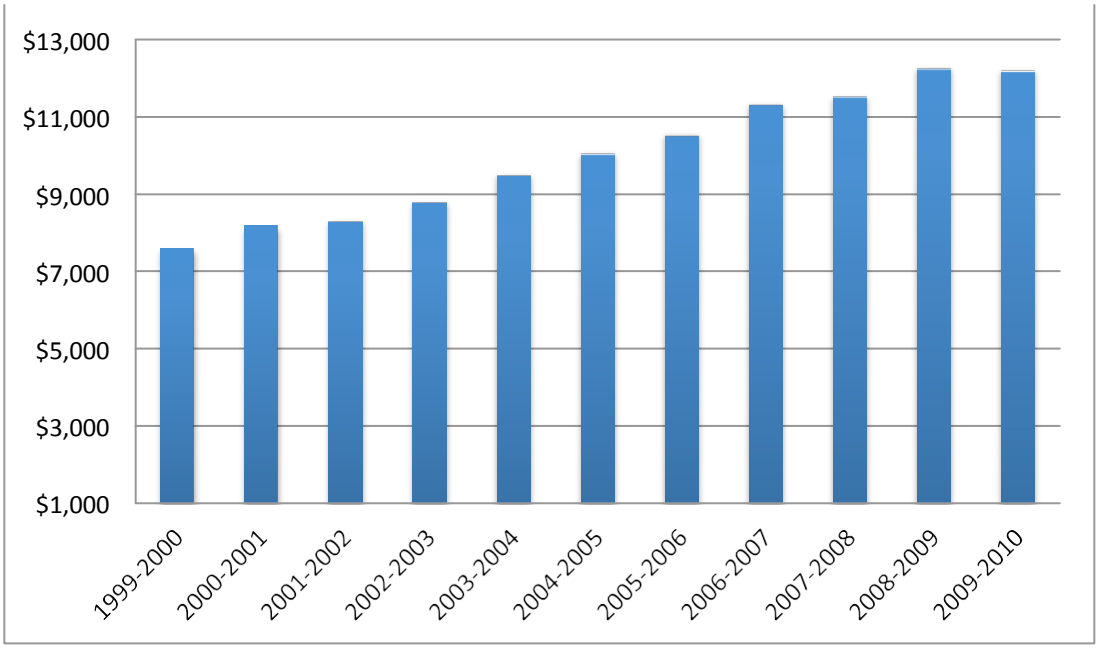
SUMMARY OF STATE COMPARATIVE FINDINGS

Maine's K-12 education system has witnessed a steady increase in spending over the past several years. However, this additional funding appears to have only resulted in modest improvements in the academic performance of the state's students.

Increased Spending

Between FY 1999-2000 and 2009-2010 Maine's state and local K-12 education revenue grew by $728.6 million (45%). The increase in state and local revenue combined with a decrease in the state's student population has resulted in an increase in per student spending from $7,595 to $12,259 (61.4%) during this time period. In both 1999-2000 and 2009-2010 Maine's per pupil spending amount was the 12th highest in the country. Figure 3.1 displays the change in per pupil spending over this time frame.

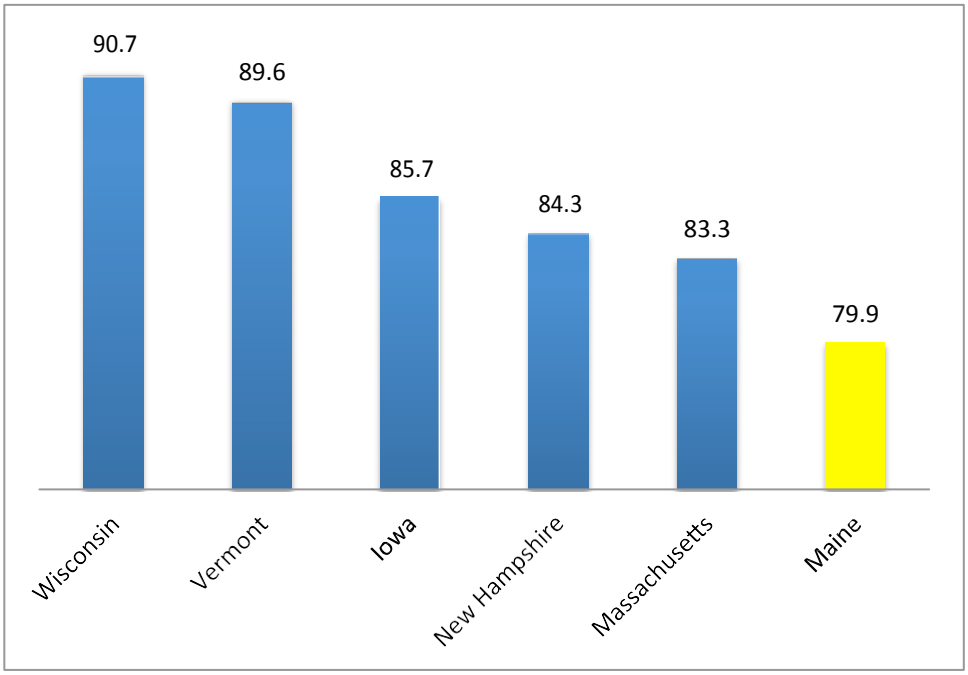
Figure 3.1: Per Pupil Spending for Maine K-12 Education: 1999-2000 to 2009-10



Mixed Performance

Between 2001-2002 and 2008-2009 Maine saw its high school graduation rate increase by 4.3% to 79.9%. While the state's graduation rate consistently ranks above the national average it trails five of its comparable states (See Figure 3.2). Maine's scores on the National Assessment of Educational Progress (NAEP) in math and reading were mixed during this time period. Between 2003 and 2011 student results in 4th and 8th grade math and 8th grade reading saw modest growth while scores in 4th grade reading decreased slightly. Maine's scores on the New England Common Assessment Program (NECAP) in math, reading and writing have remained flat over the past three years with the exception of 8th grade writing which saw a increase in the percentage of students testing at or above proficient from 53% to 58%.

Figure 3.2: 2008-09 Four Year High School Graduation Rate for Comparative States



The findings from our interstate comparison can be summarized as follows:

Educational Expenditures

- From 1999-2000 to 2009-2010 state and local revenue for public K-12 education in Maine grew from $1.62 billion to $2.35 billion - an increase of just over $728.6 million or 45%. During the same time period, state and local revenue for K-12 education in all 50 states increased by 49.4% ($171.6 billion). (U.S. Census, 2012) – See appendix 3.A for a fifty-state summary
- Between 1999-2000 and 2009-2010 Maine's per pupil expenditures grew from $7,595 to $12,259 an increase of 61.4%. Average per pupil expenditures on a national level increased from $6,836 to $10,600 a 55.1% increase during this same time period. (U.S. Census, 2012) - See appendix 3.B for a fifty-state summary

Student Population

- Maine has experienced a decrease in student population of 20,533 (10%) over the past decade (2001-2002 to 2011-2012). See appendix 3.E for a fifty-state summary
- Average school district size has declined to 808 students – making the state's school districts the 4th smallest in the nation with an average enrollment that is 25.4% the size of the average school district in the United States. See appendix 3.F for a fifty-state summary

Staffing

- Maine has seen an increase in the number of new teachers and a slight reduction in the number of administrators in the past decade. See Appendix 3.H and 3.G for a fifty-state summary
- When combined with the decline in student enrollments Maine has one of the lowest student to teacher ratios in the country. See Appendix 3.I for a fifty-state summary
- The reduced student to teacher ratios are a major cause of the state's increases in per pupil expenditures

Student Achievement

- In 2011, Maine's student test results on the National Assessment of Educational Progress (NAEP) in math and reading were mixed when compared to other states
- Maine has a four-year high school graduation rate of 79.9% which is 4.4% above the national average but trails many comparable states. See Appendix 3.M for a fifty-state summary
- Maine's New England Common Assessment Program (NECAP) test results have been flat over the past two years and trail the scores of students in New Hampshire and Vermont in math and writing in all grades and reading in all but the 3rd grade

CHAPTER 4: EQUITY ANALYSIS OF MAINE'S EPS

INTRODUCTION

Reflecting the core requirements of the Legislature's request for an evaluation of the Maine school funding system, a cornerstone of our evaluation is an equity analysis of school district revenues using traditional school finance equity statistics to ascertain how well the system meets the equity goals of the EPS. The school finance literature identifies a number of statistics used to assess the equity of a state's school funding system. The statistics can be divided into two categories: those that measure the fiscal neutrality of the system and those that measure the equality (equity) of per pupil spending across school districts in the state. Odden and Picus (2014) describe the most common approaches for measuring fiscal neutrality and equal spending. We used those approaches to measure how well the Maine school funding system has met the goals of fiscal neutrality and equity. Appendices 4.A-4.G of this document contain tables that display all of the equity statistics we have calculated for Maine over the years included in this evaluation.

Data Issues

Fiscal neutrality examines the relationship between the fiscal capacity of a school district and its revenues (or expenditures). Traditionally, school finance scholars measured fiscal capacity using per pupil property values, since many states fund their schools primarily from property tax collections. Recently, however, scholars have recognized issues related to communities with high levels of property value, but low levels of income. This concern has led scholars to add the consideration of income level as a fiscal capacity measure to supplement the property value measure.

An equal spending analyses requires the consideration of two concepts. The first is simply equal spending per pupil, known as horizontal equity. The second considers differential student needs and attempts to assess the degree to which students with different needs receive different funding based on their needs – in other words, a system possesses vertical equity if funding differences between students relates to the different educational needs of students. Therefore, everything else being equal, a school district with more students from economically disadvantaged backgrounds, more students with limited English proficiency, and more students with special needs should receive more funding to compensate for the additional cost of educating these students to meet high standards.

Given the foregoing, the following data were needed to conduct the equity analysis: revenue measures, student counts, property wealth, and median income. The following paragraphs discuss the issues related to the data used in this equity analysis.

Revenue Measures

We used four revenue measures for the equity analysis. The first measure was each SAU's EPS funding level, without special education, limited English proficiency, gifted and talented, and

transportation. This measure enabled us to analyze the extent to which the base EPS rate provides equal funding among districts. The second measure added special education, limited English proficiency, and gifted and talented funding to the first measure because these items represent revenues directed toward students with additional needs. The third measure was the total EPS revenue, which equals all state revenue plus the required local revenue. The final measure was total revenue, which equals the state revenue plus the actual local revenue (which almost always exceeds total EPS revenue.

Student Counts

Student counts were provided by the Maine Department of Education (DOE) and consist of the official count used by the Department. The unweighted student count was used for the horizontal equity analysis. For the vertical equity analysis, we applied the weights used by Maine that involve additional educational needs of children (economically disadvantaged, limited English proficiency, and special education).

Maine applied a variety of weights to district pupil counts over the years of the study. The economically disadvantaged weight was 0.15 per economically disadvantaged student over the entire 8 years of the study. Maine used three sets of weights for students with limited English proficiency, based on the number of such students in the district. The weights changed in 2009, so one set was used for the years 2006-2008 and the other set for 2009-2013. These weights are summarized below in Table 4.1.

Table 4.1: LEP Weights Used in Computing EPS Vertical Equity Statistics

	Weight	
Number of LEP Students	**2006-2008**	**2009-2013**
1-16	0.5	0.7
1-250	0.3	0.5
250 or more	0.6	0.525

Maine has a six-step formula for calculating special education revenues. The first step involves applying a weight to the special education students in each district, with a student number cap set at 15% of the district's student count. If more than 15% of a district's students were identified as needing special education services, in the second step, a weight was applied to the "additional" special education students. The weights applied in step 1 varied annually over the 8 years of the study, with a low of 1.25 and a high of 1.38. The weight in step 2 remained constant at 0.38 across the study. To obtain a single weight for each year, we computed a pupil weighted average of the two Maine weights and generated a separate weight for each year. The special education weights we computed to use in this analysis are displayed in Table 4.2

Table 4.2: Special Education Weights Used in Equity Analysis

Year	Special Education Weight
2006	1.26
2007	1.15
2008	1.16
2009	1.17
2010	1.19
2011	1.20
2012	1.20
2013	1.20

By assessing equal spending on the basis of weighted pupil counts, we can establish a measure of the vertical equity of the system. We express no opinion in this equity analysis regarding whether the current Maine weights were appropriate for the services required by the students.

Fiscal Capacity Measures

Annual per pupil property wealth data were provided by the state. The state economist also provided the measure of per capita income. To obtain values that could be linked to SAUs, we received a five year aggregate income measure.

Finally, we computed per pupil revenue deciles[10] based on district property values. The decile analyses enabled us to track changes in spending by group over time. Equity and fiscal neutrality statistics were computed using Excel and JMP. The revenue deciles were computed using Excel spreadsheets.

FISCAL NEUTRALITY

Assessing the degree of fiscal neutrality entails analyzing the relationship between measure(s) of per pupil revenues and/or expenditures and measure(s) of fiscal capacity. As discussed above, property wealth per-pupil typically is used to measure fiscal capacity, but we also consider the relationship of income to district per pupil revenues. In conducting this analysis, the greater the relationship between measures of fiscal capacity and levels of revenue, the less fiscal neutrality and, therefore, the more inequity present in the system.

Fiscal neutrality is measured using the correlation coefficient and the elasticity computed from a simple one-variable regression. The correlation coefficient indicates the degree to which there is

[10] Student deciles are computed so that approximately 10% of the students in the state are in each decile. As a result the number of districts in each decile can vary substantially.

a linear relationship between two variables, i.e., whether as one variable increases the other increases (or decreases). The coefficient ranges in value between -1.0 and +1.0. A value of +1.0 or close to +1.0 indicates a strong positive relationship, for example, as property wealth increases so does revenue per-pupil. A correlation coefficient close to zero indicates that there is little or no linear relationship between the two variables. For fiscal neutrality, the ideal value of the correlation coefficient is zero, but the generally accepted standard for this statistic is +0.50 or less (Odden & Picus, 2008).[11]

While a correlation coefficient indicates whether a linear relationship exists between two variables, the elasticity indicates the magnitude (slope) or policy importance of that relationship. For example, revenues and wealth could be strongly related, but if a ten-fold increase in property wealth only resulted in a small increase in revenues, one could argue that the magnitude of the relationship was not significant and of little policy significance.

Technically, the elasticity indicates the percent change in the object variable, revenues per-pupil, relative to the same percent change in the measure of fiscal capacity, (e.g., property value per-pupil). The elasticity of a school funding system usually ranges in value from zero to any positive number, although the elasticity can also be negative. In school finance, an elasticity of 1.0 indicates that revenues increase at the same percentage rate as the wealth measure. Elasticities above 1.0 indicate that spending increases in percentage terms at a higher rate than property wealth. Finally, elasticities below 1.0 indicate that spending does not increase at the same percentage rate as local property wealth local property wealth.

When interpreting the elasticity values, it is important to keep in mind that the goal of horizontal equity is for each child in the state to be funded at the same level. However, one typically finds that schools located in areas with more wealth tend to receive greater funding per pupil. As with the correlation coefficient, complete horizontal equity would be achieved if the elasticity equaled 0.0, because that value would indicate that school spending did not rise as wealth rose. Along the same lines, a system with an elasticity of 1.0 or more would involve having per pupil spending rise very rapidly as wealth rises. The equity standard for the wealth elasticity is for it to be equal to or less than 0.10 (Odden & Picus, 2014), because such a value would show that per pupil spending, although rising with wealth, did so at a slow rate.[12]

The elasticity between a dollar object, such as revenues per-pupil, and property wealth per-pupil, can be calculated using the slope of the linear regression of revenues on wealth; the elasticity equals the slope (the regression coefficient for wealth) times the ratio of the mean value of property wealth per-pupil and the mean value of revenues per-pupil.

It is important to assess the correlation coefficient and elasticity jointly. If the correlation is high and the elasticity is low, a relationship exists between the two variables but the relationship is not of policy importance. On the other hand, if the correlation is low and the elasticity is high, even

[11] The +0.50 figure implies that a negative correlation would be acceptable at any value. Negative correlations between wealth and per pupil spending are rare in school finance because wealthier districts tend to receive more revenues per pupil than poorer districts (no negative correlations were found in this study). Therefore, for practical purposes, the range of acceptable correlations is 0.00 to 0.50.

[12] In theory, the elasticity could be negative, but this occurs very rarely.

the tenuous link between the two variables might have policy significance. If both the correlation coefficient and elasticity are high, then fiscal neutrality does not exist: the two variables are linked and the magnitude of the link is strong. Finally, fiscal neutrality is achieved if the value of each variable is below the benchmark.

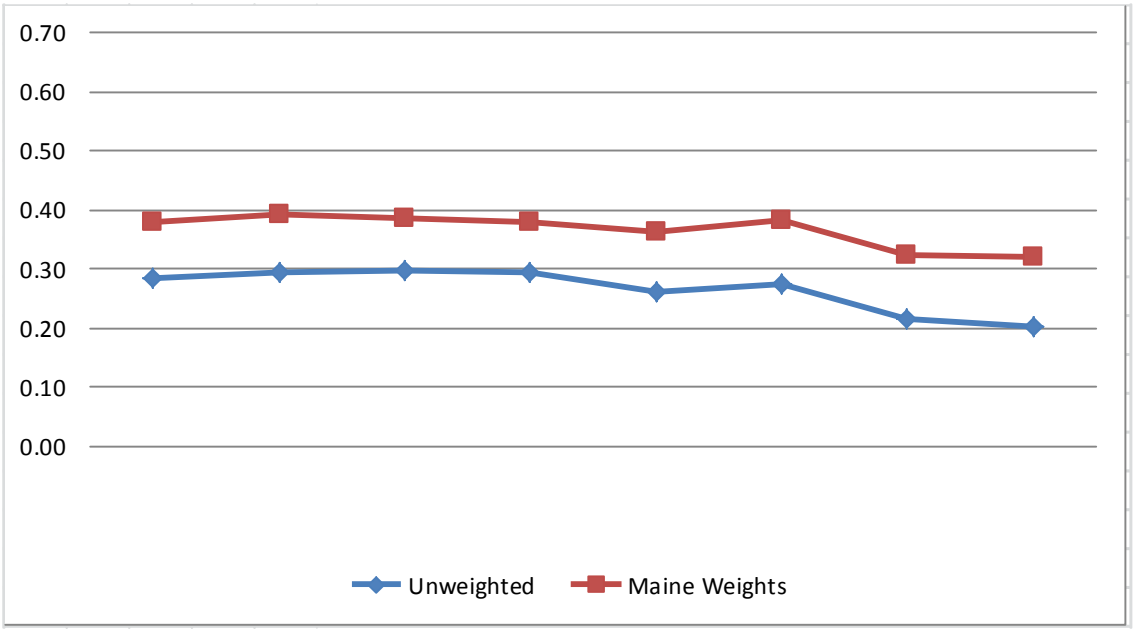
The benchmark standards established for this analysis are very strict measures that few states meet. Two important things to remember when reviewing the fiscal neutrality and equity statistics are how close the measures are to the standards and how the values have changed over time.

Correlation Between Revenues and Property Wealth

Maine school funding showed small, positive correlation between revenues and property wealth as long as raised local revenues were not considered. Each of the three revenue measures that did not include raised local revenues had similar correlations, as seen in Appendices 4.A to 4.D Figure 4.1 displays the correlation between per pupil EPS revenues (with special education, LEP, and GT included) and per pupil property wealth over time to illustrate an example of the relationship. Similar results were obtained whether using unweighted and weighted pupil counts.

All of the correlation coefficients computed for this analysis were below the correlation standard of 0.50, which suggests that revenues were not highly correlated with property wealth. Two important relationships can be seen in Figure 4.1. First, the correlation was slightly higher for weighted pupils than for unweighted pupils. Second, fiscal neutrality as measured by the correlation between property wealth and per pupil spending improved during the course of the study, particularly after FY 2011.

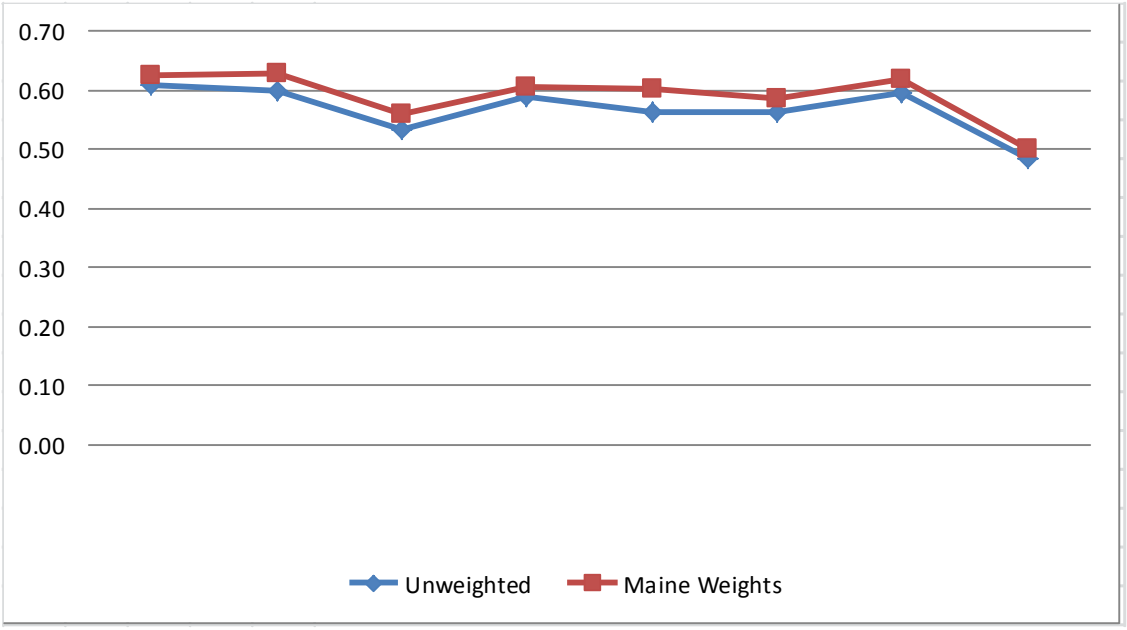
Figure 4.1: Correlation Between EPS Revenues (with Special Education, LEP, and GT) and Property Values: FY 2006 – FY 2013



The correlation coefficients were much higher when the revenue measure included the total revenues actually raised locally and state revenues as shown in Figure 4.2. The coefficients were uniformly higher than the standard of 0.50, other than for the 2013 projections. This result shows that the relationship between per pupil property wealth and per pupil revenues was stronger when the total amount of revenues raised by localities was included in the model. The greater ability of wealthier communities to raise local funds reduced the fiscal neutrality of the system.

Two other implications are apparent from the Figures 4.1 and 4.2. First, the impact of weighting the students had a negligible impact on the correlation coefficient. Second, the fiscal neutrality remained roughly constant during the years of the study, with the exception of the 2013 projections.

Figure 4.2: Correlation Between EPS Revenues (Raised Local and State) and Property Values: FY 2006 – FY 2013



In summary, the correlation between property wealth and revenues remained within the established guidelines throughout the course of the study, except when we took into account the revenues actually raised by localities – revenues which include funds raised by each SAU beyond of the EPS funding computation. The correlation values remained similar over the time period of the study, but a slight improvement over time was observed. The reduced fiscal neutrality when accounting for raised local revenues was due primarily to lower revenues in very property poor districts and greater revenues in very high wealth districts, as will be discussed below.

Elasticity Between Revenues and Property Wealth

Figures 4.3 and 4.4 display the property wealth elasticity of the Maine school finance system between FY 2006 and FY 2013. The annual data underlying this figure are displayed in Appendices 4.A- 4.G. Figure 4.3 shows the elasticity on an unweighted pupil count basis for all four measures of revenues. Figure 4.4 shows the same revenue data using weighted pupils.

Using the elasticity benchmark standard of 0.1, Figures 4.3 and 4.4 show that Maine school funding had an extremely low elasticity for all revenue measures that did not include the total amount raised by the localities. The values consistently were higher when the raised local revenues were included in the revenue measure, with the values edging above the standard of 0.10 in some years. These results suggest that the Maine school finance system is fiscally neutral with respect to property wealth when considering the amount of local revenues school districts are supposed to receive. However, the ability of localities to raise additional local revenues increases the elasticity of the system to the extent that in most years the value falls very close to or even above the standard for elasticity.

The results of the fiscal neutrality analysis were very similar for both correlation and elasticity. In order to better understand which districts were (or were not) benefitting from the introduction into the system of additional local revenues, for each year we divided the state's students into deciles ranked by the per pupil property value. Decile 1 contained the 10% of the student population (approximately) educated in the districts with the least property wealth; in contrast, Decile 10 contained students in the districts with the most property wealth. The mean per pupil locally raised and state revenue for each year was calculated for each decile. We then computed for each decile its percentage of the mean revenues each year. Figure 4.5 displays the results of these calculations.

As Figure 4.5 shows, the deciles can be classified into three groups. The mean per pupil revenues in Decile 1 consistently stayed below 90% of the mean for the entire time period of the study. Deciles 2-8 form the second group, which has values clustered near the mean value of revenues. Finally, Deciles 9 and 10 were 10% and 20% above the mean revenue value, respectively, throughout the study.

Figure 4.5 provides insight into why the correlations and elasticities were higher when we included all locally raised revenues along with state revenues. Districts in the decile with the least property wealth were able to raise less local funds, on average. In contrast, districts in the two deciles with the greatest property wealth were able to raise more local funds, on average. Maine has a large group of districts in the middle (comprising about 70% of the state's students) that raised local revenues at similar rates. In other words, districts at the property wealth extremes (in either direction) on average had revenues that differed from the mean, but the districts in the middle tended to have similar, roughly average revenue levels. This finding means that the system is fiscally neutral for districts with about 70% of the students, that is

districts with property values in the middle deciles. However, the revenue differences for the wealthiest and poorest district adversely affect fiscal neutrality of the system as a whole.

Figure 4.3: Elasticity Between Education Revenues Per Pupil (Unweighted) and Property Wealth: FY 2006 – FY 2013

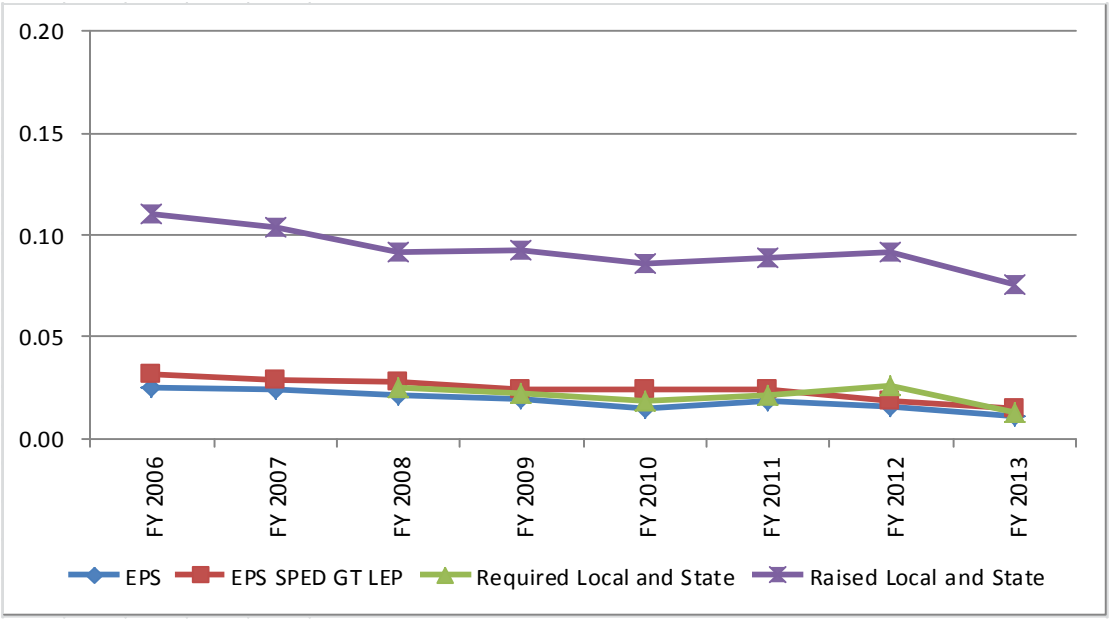


Figure 4.4: Elasticity Between Education Revenues Per Pupil (Maine Weighted) and Property Wealth: FY 2006 – FY 2013

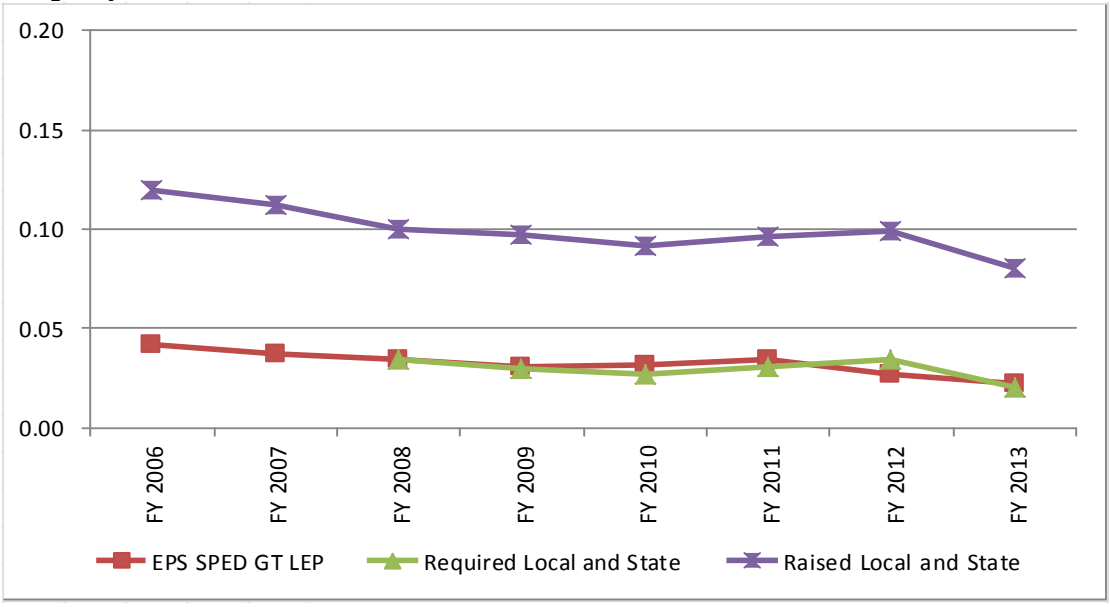
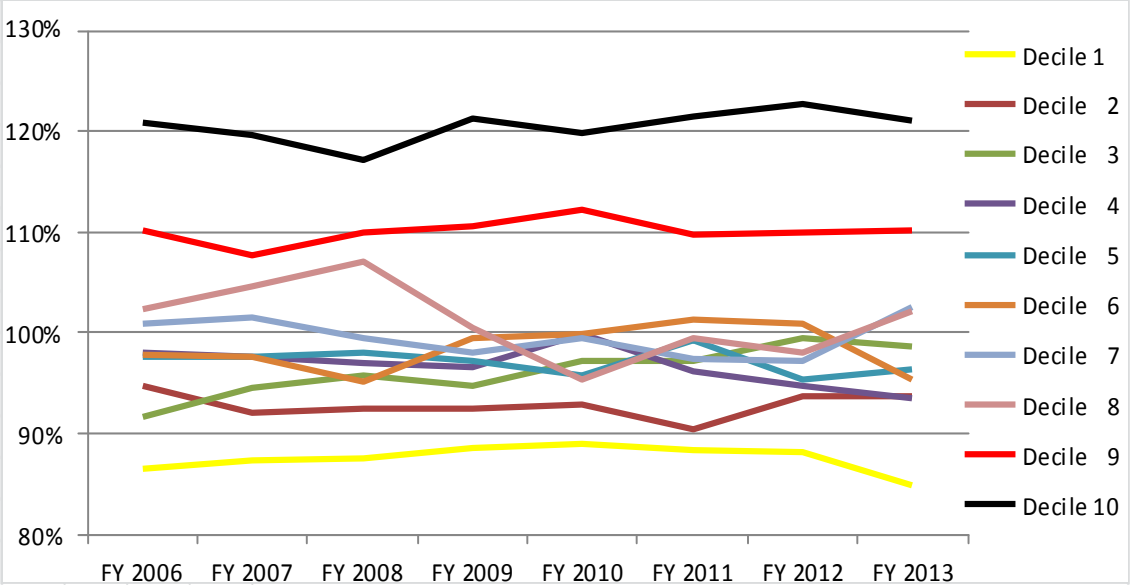


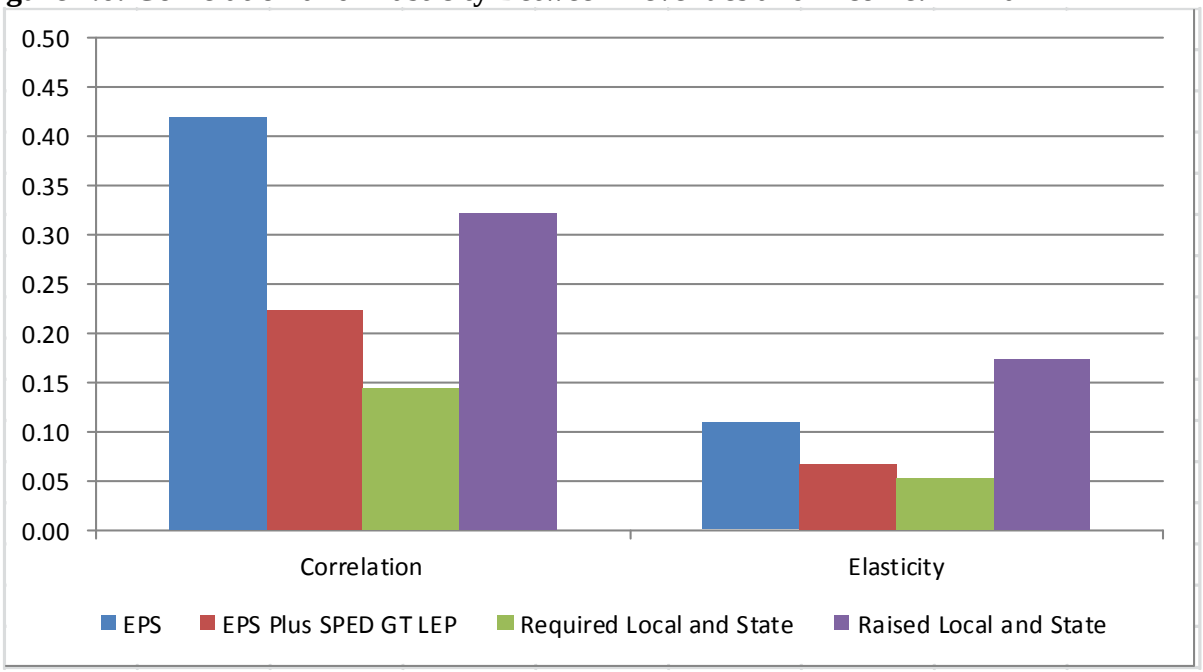
Figure 4.5: Percentage of the state's mean revenues (raised local and state) by decile: FY 2006 – FY 2013



Correlation and Elasticity Between Revenues and Income

Figure 4.6 and Appendices 4.A- 4.G display the results for the correlation between per pupil revenues and per capita income for the 2012 fiscal year using unweighted student counts. The figure shows that the values of the correlation coefficients were well below the benchmark value of 0.50 throughout the period of this analysis. Unlike our estimates for property value, the highest value of the correlation coefficient was for the base EPS value, not the revenue measure that included all raised local revenues. That said, the essential point from the correlation side of the figure is the correlation between revenues and income was comfortably below the 0.50 standard suggesting a high level of fiscal neutrality even when measured on the basis of per capita income.

Figure 4.6: Correlation and Elasticity Between Revenues and Income: FY 2012



The elasticity portion of Figure 4.6 (and Appendices 4.A- 4.G) tells a somewhat different story about the relationship between revenues and income. As can be seen in the figure, the elasticity of the system edged over the benchmark value of 0.10 for base EPS revenues and was above the benchmark when raised local revenues were included. As mentioned in the introduction to the fiscal neutrality section, the low correlation and high elasticity between these revenues and income can have policy implications. The policy implications may be indicated more strongly when considered in conjunction with the high correlations and elasticities between raised local and state revenues and property values. It appears that the inclusion of additional local revenues by relatively wealthy districts (in terms of income) and the corresponding inability of less wealthy to do the same, negatively impacted the fiscal neutrality of the system as a whole.

The similarity of the fiscal neutrality results whether the wealth measure was per pupil property value or per capita income led us to consider the relationship between those two variables. The student weighted correlation between the wealth variables (using 2012 data) was 0.333, which is a moderate correlation. This result suggests that areas with greater property wealth also tend to have greater per capita income, which reinforces the differential ability to raise funds between poor and wealthy districts.

Summary of Fiscal Neutrality Estimates

The Maine school funding system overall has succeeded in designing a fiscally neutral distribution of revenues. However, the addition to the system of local property tax funding above the level required to fund the EPS introduced inequities into the system. The essential fiscal neutrality finding is the Maine school funding system as planned would have achieved fiscal neutrality, but the differential abilities of districts with different levels of wealth (property and income) to raise local funds reduced the fiscal neutrality of the system somewhat.

SPENDING EQUALITY

A second important equity concept is measuring the equality of per pupil spending across the state's school districts. Appendices 4.A- 4.D and Appendices 4.E- 4.G display the annual equity statistics on a horizontal equity basis and a vertical equity basis, respectively. In this section, we describe our findings regarding the equality of spending across Maine school districts based on an analysis of horizontal and vertical equity as described above. Review of the tables shows that the equity statistics for spending equality have stayed rather consistent over time even though all of the spending measures increased substantially.

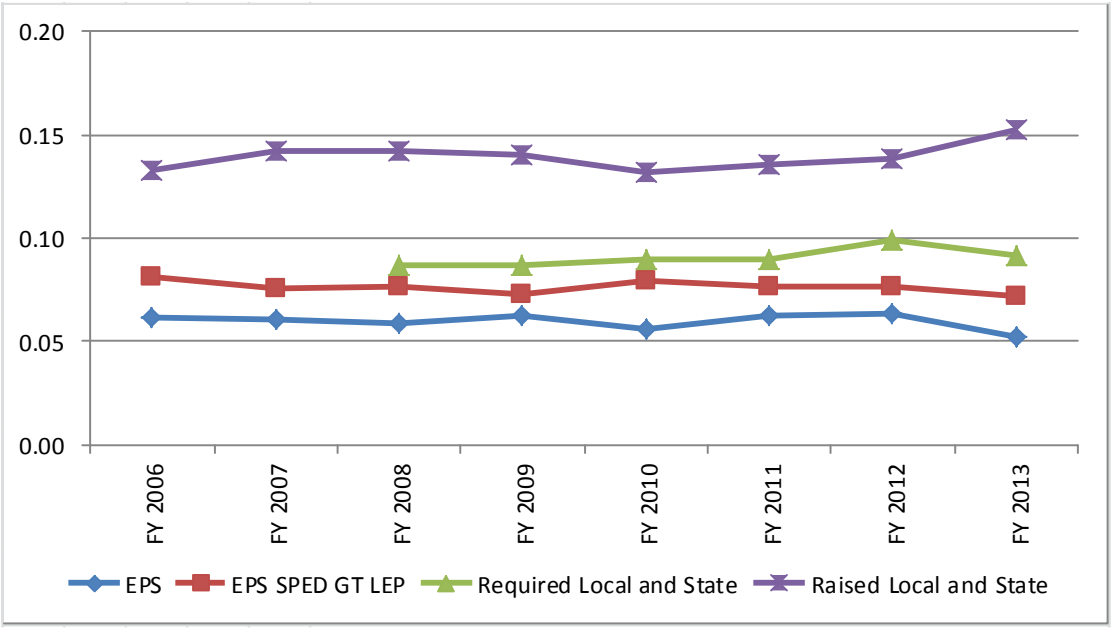
We assessed vertical equity by using weighted pupil counts. A comparison of Appendices 4.A-4.D and Appendices 4.E- 4.G shows that weighted per student revenue figures were lower than unweighted per student revenue. This outcome results from the fact that pupil weights increase the student count, so the same revenue figures are divided by the higher pupil count. Despite this difference, review of the two tables shows that the equity estimates are similar over time and slightly worse when vertical equity is measured. This slight difference in the values of the equity statistics suggests that differences in funding across districts were based primarily on factors other than the differing educational needs of the students.

To facilitate the analysis of the equality of spending in of the Maine funding system, three of the statistics presented in Appendices 4.A- 4.G are displayed below in graphic form. The three statistics reviewed here are the coefficient of variation (CV), the McLoone Index, and Verstegen Index.

Coefficient of Variation

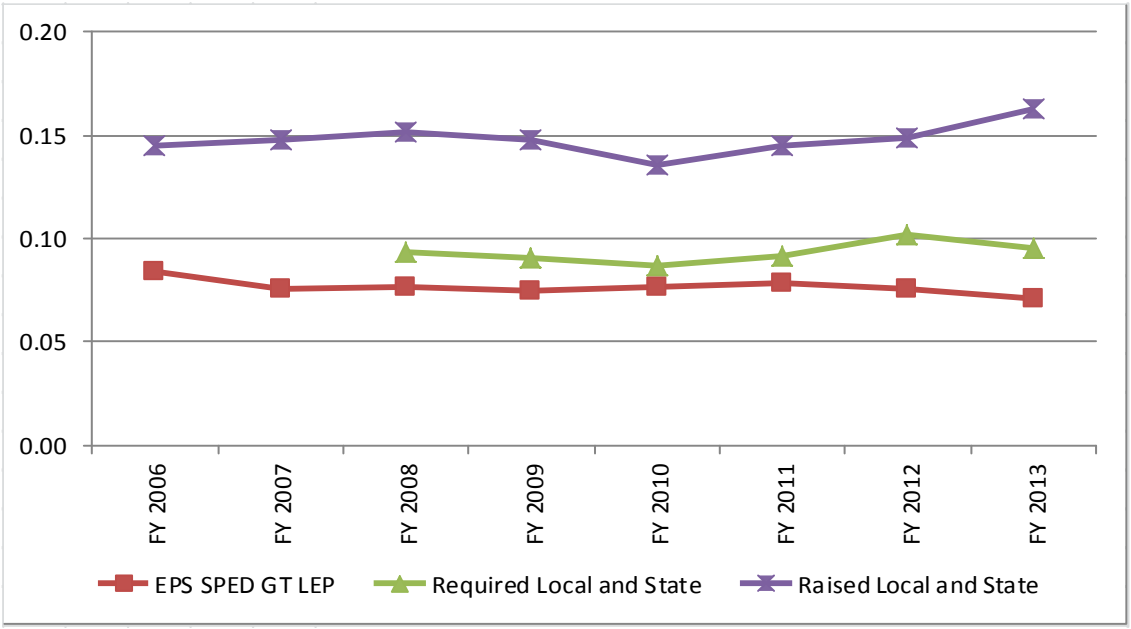
Figures 4.7 and 4.8 summarize the coefficient of variation for unweighted and weighted student counts from FY 2006 to FY 2013, respectively. Odden and Picus (2014) suggest using a value of 0.10 as the benchmark for assessing the revenue equality of a state's school finance system, with values of 0.10 or below indicating a high level of equity. Figures 4.7 and 4.8 show similar results. The CV in Maine generally met the 0.10 standard, except for the revenue measure that included raised local revenues. The values of the CV for the latter measure were above the standard each year.

Figure 4.7: Coefficient of Variation for unweighted students: FY 2006 – FY 2013



The values of the CV were slightly higher for weighted student counts than for unweighted student counts. One would expect the values to be lower for weighted students if the funding differences were a response to differing educational needs of students. This result suggests student needs do not appear to have been the primary consideration driving funding differences, especially since the slight differences are in the opposite direction of what was anticipated.

Figure 4.8: Coefficient of Variation for weighted students: FY 2006 – FY 2013



McLoone Index

Figures 4.9 and 4.10 display the values of the McLoone Index for FY 2006 through FY 2013. Odden and Picus (2014) suggest a benchmark of 0.95 (1.00 being ideal) for the McLoone Index; that value would indicate that substantial equity exists across districts in the bottom half of the revenue distribution. Figures 4.9 and 4.10 show that the Maine school finance system came close to the McLoone benchmark of 0.95 in all years. As with the CV, the McLoone figures showed the greatest inequity when the raised local revenues are included. We also note that the range between the McLoone with raised local revenues and the McLoone with just the EPS has grown over time, which suggests that the poor (however defined) are increasing local revenues slower than the other districts, a result consistent with our other findings.

Figure 4.9: McLoone Index unweighted students: FY 2006 – FY 2013

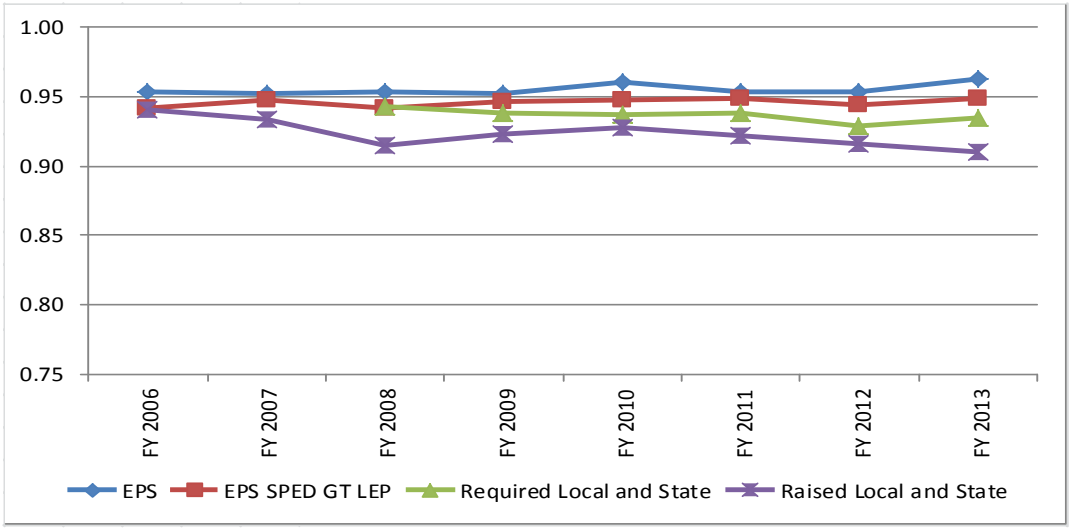
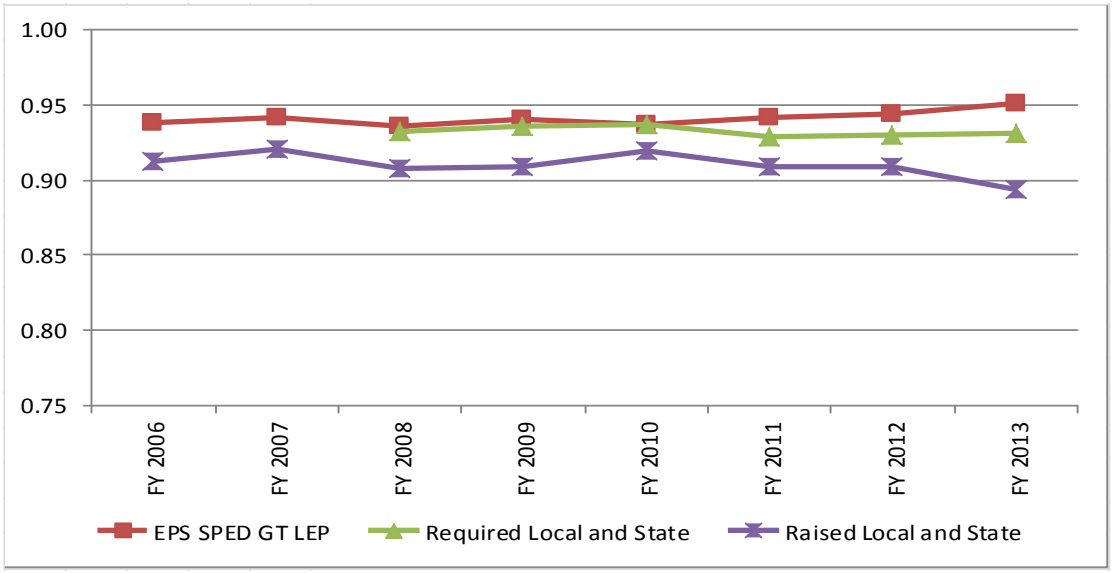


Figure 4.10: McLoone Index weighted students: FY 2006 – FY 2013



Verstegen Index

Figures 4.11 and 4.12 display the values of the Verstegen Index for each year of the analysis. Odden and Picus (2014) suggest a benchmark of 1.05 (1.00 being ideal) for the Verstegen Index; this value would indicate that there is substantial equity across districts in the top half of the revenue distribution. Figures 4.11 and 4.12 and Appendices 4.A- 4.G show that the Maine school finance system rarely met this benchmark each year and never got very close when locally raised revenue was included.

A comparison of Figures 4.9 through 4.12 shows that the inequities that exist in per pupil revenues are somewhat more pronounced in the top half of the distribution. The values for the Verstegen Index are slightly farther away from the benchmark, especially with regard to the revenue measure that includes raised local revenues. This comparison is consistent with the results of the decile analysis in the fiscal neutrality section, which showed that two deciles were funded well above the mean and one decile was funded well below the mean.

Figure 4.11: Verstegen Index unweighted students: FY 2006 – FY 2013

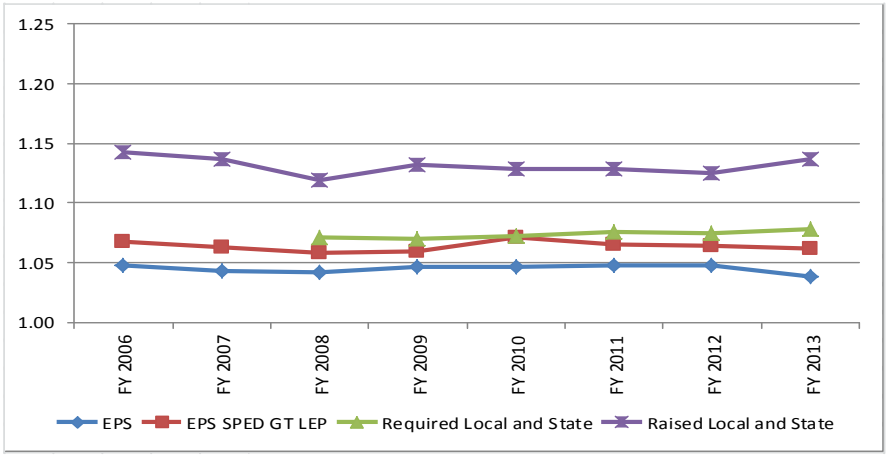
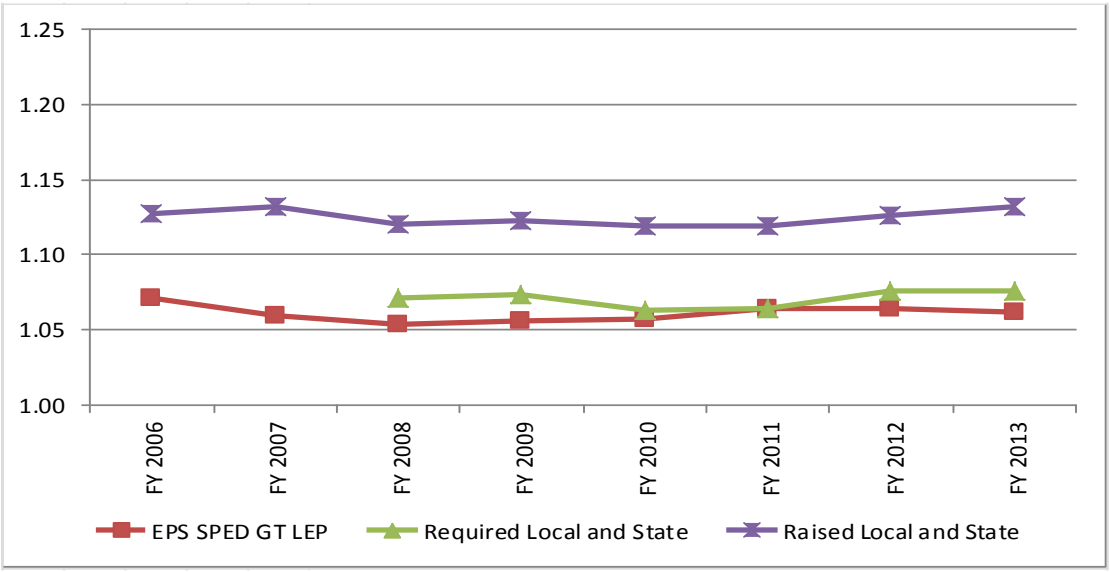


Figure 4.12: Verstegen Index weighted students: FY 2006 – FY 2013



Overall, Figures 4.7 to 4.12 suggest that the Maine school funding system came quite close to meeting the spending equality benchmarks suggested by Odden and Picus (2014), except when we accounted for the differential ability of districts to raise local funds. The inequities in the system seem to come largely from local resources.

Conclusions

Overall, two patterns consistently emerge from our equity analysis of the Maine school funding system. First, we found that the system, as designed, met (or very nearly) met all of the strict benchmarks established by Odden and Picus (2014) for fiscal neutrality and equity. This finding held when we used multiple measures of both property wealth per pupil and per capita income, and when we used both weighted and unweighted pupil counts in the analysis.

We did find that the equity and fiscal neutrality of the system changed slightly for the worse when we included local revenue raised through property taxes above the level of EPS funding. The revenue equality statistics indicate that the relatively small funding disparities in Maine arise to mostly from wealth disparities across SAUs whether measured on the basis of property wealth per pupil or median per capita income.

In our analysis of revenue equality, we compared how the districts in the bottom half of the revenue spectrum fared when compared to those at the median. Analysis of the McLoone Index values we computed shows they generally fell between 0.90 and our strict benchmark of 0.95. We also assessed spending differences for the top half of the distribution using the Verstegen Index and found that it generally fell between 1.10 and 1.15 when locally raised revenue was included, somewhat farther above our strict benchmark of 1.05. Taken together, these results suggest that minor revenue inequalities exist on both ends of the spectrum in Maine, with greater inequity at the top than at the bottom of the funding distribution. In other words, wealthier districts, whether measured by property wealth per pupil or per capital income tend to raise

somewhat more revenue per pupil than poor districts, although this disparity is relatively small compared to most other states.

If the state wants to mitigate the inequities caused by local revenue raising capacity, there are two options. The first issue revolves around increasing funding to the least wealthy districts and could be resolved by adding power equalization (also called a guaranteed tax base) on top of the state's foundation program, as is done in eight other states (see chapter 3 for details). This approach would involve providing state assistance to school districts choosing to levy taxes above the minimum required to fund their contribution to the EPS in inverse relationship to the measure of wealth. In other words, for each unit of tax raised, a district would be guaranteed a certain amount of revenue per pupil. The state would contribute the difference between the guarantee and what was raised locally. The state could also decide to cap this equalization at some level if it chose to do so, likely creating a disincentive to raise revenues beyond that point for poor districts. The determination of what level to stop funding the guarantee will have a substantial impact on the future equity of the funding system, with higher guarantees leading to greater equity. Power equalization can add more money to the system in order to increase the equity of school funding. This approach provides a disincentive to unlimited funding by tying the state's contribution to local decisions about how much localities should tax themselves.

The more difficult issue involves the inequities on the high end of the distribution. Essentially, a state has three options in terms of dealing with such inequities. First, a state can prohibit districts from raising funds beyond a certain limit. This approach would increase equity, but has the drawback of being extremely unpopular in wealthy districts and causing children in such districts to receive fewer resources than they would otherwise. The other option involves raising funding to all other districts to match funding in the wealthy districts. This also would achieve equity, but would be prohibitive in terms of the amount of funding required to achieve equality. The final option consists of leaving the inequity in place. The presence of the inequity is the obvious drawback to this approach. The benefits are it does not reduce resources to any district. In addition, higher funded districts sometimes drive additional funding for all districts, as what once was a "luxury" in wealthy districts eventually becomes a "necessity" in all districts.

We lay these options before the legislature, but make no recommendation regarding which should be followed. The legislature must decide which choice is in the best interests of the citizens of Maine. However, once the legislature decides which course to pursue, we can recommend the best possible alternative for achieving the legislature's goals and objectives.

These results are consistent with the findings of the decile analysis, which showed the two wealthiest deciles consistently raising revenues above the mean, the next seven deciles raising revenues close to the mean, and the least wealthy decile raising revenues below the mean. Therefore, the state would have to address two issues if it chooses to improve the fiscal neutrality and equity of the system. The first issue would involve increasing the revenues raised by the lowest decile to the level of the seven deciles immediately above it. This objective could be met by using state resource incentives to supplement additional revenues raised by poor school

districts. The second, and far more challenging, issue would be increasing all deciles to the level of the wealthier deciles. Achieving this objective would be far more expensive.[13]

Another important finding relates to the vertical equity of the system. The equity of the system changes very slightly for the worse when student counts were weighted by student needs, which implies that the funding disparities were not attributable to meeting the special needs of at risk students. This finding suggests that the state might want to consider new ways of providing funds to school districts in order to help them meet the needs of their neediest students.

In summary, Maine designed a school funding system that provides districts with an equitable resource distribution, as revenues are computed by the system. However, the differential ability of districts to raise funds above what the system requires has reduced the fiscal neutrality and the equity of the system. The funding disparities appear to be based more on fiscal capacity than student needs.

SUMMARY OF RESULTS

Our equity analysis focuses on three main issues: the extent to which education revenues are related to property and/or income wealth, the equality of education revenues across districts, and the extent to which differences in education funding relate to the needs of students. The analysis shows that EPS revenues in Maine have tended to be related to wealth very weakly (at an acceptable degree under standard school finance equity benchmarks), but that local revenues above the EPS amount strengthens the relationship between wealth and revenue somewhat. In technical language, we find that the base Maine school funding system was fiscally neutral, but the addition of local revenues made the system somewhat less neutral, although better than similar measures find for most other states.

The equality of revenues in Maine remained consistent over the years covered in the study. The EPS portion of the funding system consistently met the accepted benchmarks of equality, but the addition of local revenues above the EPS added a small degree of inequity to the system.

The inequities in the system did not appear to be related to student needs. The equality of funding in the Maine school funding system, accounting for student differences, was similar to the overall equality of funding. Again, the inclusion of local funding above the EPS decreased the equity of the system as considered in this manner.
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[13] It would be possible to achieve equity by lowering revenues to wealthy districts. However, doing so would violate the proposition that equity should be achieved by raising the quality of education provided to students, rather than lowering the quality of education.

CHAPTER 5: ANALYSIS OF MAINE'S TRIBAL FUNDING

INTRODUCTION

This chapter reports on funding for Maine's tribal schools, responding specifically to the portion of the RFP asking for analysis of:

> The various ways that other states provide for the funding of tribal schools, including but not limited to, the interaction of the state's school funding system with federal funding provisions for tribal schools and the advantages and disadvantages of those approaches

In addition to looking at other states' funding of tribal schools, this chapter addresses how federal funds for Indian students not in tribal schools are accessed and used in other states. First, we describe different federal tribal school and Indian education funding streams. Second, we look at how Maine's tribal schools are funded and what other federal Indian education funding is being spent on Indian students in Maine who are not in the tribal schools. We then describe how tribal schools are (or are not) included in other states' funding systems, and also how other states use federal Indian education funding for students not in tribal schools. Finally we look at how Maine compares with these other states and discuss what Maine might do differently.

FEDERAL INDIAN EDUCATION FUNDING SOURCES

There are several primary federal Indian education funding streams. These include U.S. Department of the Interior Bureau of Indian Education funds for tribal schools, U.S. Department of the Interior Bureau of Indian Affairs Johnson O'Malley funds, U.S. Department of Education Elementary and Secondary Education Act Title VII Indian Education funds, and federal Impact Aid.

Tribal Schools Funding

The Bureau of Indian Education (BIE) within the U.S. Department of the Interior administers Federal funding for tribal schools. Across the country, the BIE funds facilities on 64 reservations in 23 states, including 123 grant schools and 3 contract schools controlled by tribes, and 57 schools directly operated by the BIE. About 42,000 students are enrolled in these schools. The BIE-operated schools are generally outside of state public schools systems, though they may fall under state standards and assessment requirements (USDOI, 2013). BIE contract and grant schools are generally on or near reservations and are operated by tribes. All BIE contract and grant schools receive funding to implement a Title I School-wide Program. These schools also typically receive Title II-A professional development funding, 21st Century Community Learning Center funds, federal special education monies, Title X McKinney Vento-Homeless Assistance Act funding, and Family and Community Engagement (FACE) funding. Title VII Indian Education formula grants are also awarded to BIE-funded tribal schools (Steve Nelson, Education Northwest, personal communication, December 18, 2012; USDOE, 2007).

Johnson-O'Malley

Johnson-O'Malley (JOM) funds are distributed to tribes as part of the U.S. Department of the Interior Bureau of Indian Affairs Tribal Priority Allocation (TPA) block grant. JOM initially was the mechanism by which the Federal government funded programs for educating Indian students in public schools, providing academic and remedial services and other programs. After the development of the Impact Aid program (see below), JOM funding was reduced and redirected to special programs for Indian students, instead of general operating funds. JOM funding has not increased in over a decade and a half; funds are allocated based on student enrollment counts that have not been updated since 1995. However, per a U.S. House of Representatives Report accompanying the Department of the Interior FY 2012 appropriations, a count of JOM-eligible students is currently underway. Eligible students must be enrolled members of a Tribe or recognized as eligible for BIE services and have at least ¼ degree of Indian blood. Any state, district, tribal organization or Indian corporation is eligible to apply for a contract to provide supplemental or operational support programs. These funds can also be used to cover Indian students residing in Federal boarding facilities and attending public school in a state other than their home state (Bureau of Indian Education, 2012; Mid-Continent Comprehensive Center, n.d., National Johnson-O'Malley Association, 2009)

Title VII Indian Education Funds

Title VII Indian Education funds are formula grants from the U.S. Department of Education (DoE) provided to school districts and BIE-funded or operated schools based on the number of Indian students and the state's per pupil expenditures as part of the Elementary and Secondary Education Act of 1965. Districts must have at least ten identified Indian children, or at least 25% of the district's total enrollment must be indigenous (these children do not need to be enrolled in a tribe, only identified as being American Indian or Alaska Native). Title VII Demonstration Grants are awarded on a competitive basis to state education agencies, local educational agencies, Indian tribes and certain BIA schools, and can be used for a variety of activities including early childhood education, special health and nutrition services, career preparation partnerships and family literacy services. Postsecondary institutions can receive professional development grants in partnership with tribal organizations (USDOE 2007, USDOE 2004).

Impact Aid

The Federal Impact Aid program provides funds to local school districts whose boundaries encompass lands that are owned by the Federal Government or removed from local tax rolls, including Indian lands. The Impact Aid Law is now Title VIII of the No Child Left Behind Act of 2001, and the funds are administered by the U.S. Department of Education. Impact Aid is considered general funds which districts may use as they choose, though some Impact Aid funds must be used for specific purposes (USDOE, 2008).

Districts receiving funds for students living on Indian lands must consult with parents and tribes of the children about the education provided and to ensure these children receive equal educational opportunities. These students receive a higher weight in the federal Basic Support Payments formula for federally connected students, the mechanism by which the U.S. DoE

determines how to allocate this funding; school districts are eligible to receive Basic Support Payments if at least 400 of their students, or 3 percent of their enrollment, are federally connected. Federal Impact Aid has not been fully funded in recent years. (USDOE, 2012).

FEDERAL FUNDING OF INDIAN EDUCATION IN MAINE

Tribal School Funding

Maine has three tribal schools that receive funding from the Bureau of Indian Education, directly serving students in grades K-8:

- Pleasant Point (Beatrice Rafferty) School, a BIE Contract Day School
- Indian Island School, a BIE Grant Day School
- Indian Township School, a BIE Contract Day School

The three tribal schools fall under "Maine Indian Education," (MIE) which functions as a tribal school district serving the three federally recognized reservation communities in the state. Each school has its own principal and school board; all three are under the supervision of one Superintendent. Once students graduate from the tribal schools, they attend Maine high schools, fully funded by EPS through vouchers managed by MIE. No BIE funding follows those students to high school (Superintendent Ronald Jenkins, personal communication, January 25, 2013).

In FY 2012, Beatrice Rafferty School (aka Pleasant Point) enrolled 109 K-8 students and provided vouchers to 41 9-12 students. Indian Island served 120 K-8 pupils and supported 28 9-12 students, and Indian Township enrolled 132 K-8 students and managed vouchers for 53 9-12 pupils. Thus in total, for FY 2012 these schools were responsible for educating 483 students – 361 K-8 students and 122 9-12 students.

In addition to BIE funding for the K-8 programs, each of these schools receives Federal Impact Aid, Title VII Indian Education funds, Special Education and Title I funds from the BIE, and 21st Century Community Learning Center grants. The schools also receive State of Maine Essential Programs and Services Funding (EPS). Between 40 and 47% of the schools' funding is from the BIE, 28-37% of the schools' funding is from the State of Maine, and the remainder is mostly from the U.S. Department of Education, with a small reserve from prior years and in one case Head Start funding (see Table 5.1).

Table 5.2 shows that per pupil revenues for the three MIE schools in FY 2013 is substantially higher than the average per pupil revenue for Maine's SAUs. Specifically the three schools receive over $27,000 per pupil with one school, Pleasant Point receiving over $34,700 in per pupil revenues in FY 2013. Understanding of the revenues allocated to each student is complicated by the fact that high school students are educated in Maine high schools funded through vouchers that are part of the state EPS funding. If the receiving high school tuition more closely parallels the funding levels of other Maine high schools, funding for K-8 students may be substantially above the figures presented in Table 5.2. We suggest this detailed information be collected and analyzed in Part 2 of this study.

Table 5.1 Maine Indian Education Schools Budget Summaries & Budget Projections for 2013

		FY 2011 Actual	FY 2012 Budget	FY 2013 Projected	% of Projected
Pleasant Point School (Beatrice Rafferty School)					
Revenue Source	Bureau of Indian Affairs	$2,263,369	$2,168,720	$2,130,487	40.60%
	State of Maine	$1,655,780	$1,805,698	$1,806,646	34.40%
	US Department of Education	$498,593	$570,700	$578,300	11.00%
	Banks and others	$22,500	$22,000	$22,000	0.40%
	Head Start	$280,855	$259,800	$265,000	5.10%
	Left over from Last Year	$245,167	$262,361	$443,928	8.50%
	Total Revenues	**$4,966,265**	**$5,089,279**	**$5,246,361**	**100.00%**
Indian Township School					
Revenue Source	Bureau of Indian Affairs	$2,600,024	$2,367,645	$2,452,394	44.20%
	State of Maine	$1,910,951	$2,111,340	$2,049,610	37.00%
	US Department of Education	$677,810	$675,540	$698,193	12.60%
	Banks and Others	$72,874	$18,000	$21,500	0.40%
	Left Over from Last Year	$207,596	$150,006	$324,984	5.90%
	Total Revenues	**$5,469,255**	**$5,322,531**	**$5,546,681**	**100.00%**
Indian Island School					
Revenue Source	Bureau of Indian Affairs	$1,840,397	$2,036,438	$1,935,763	46.60%
	State of Maine	$1,066,862	$1,183,022	$1,177,322	28.30%
	US Department of Education	$492,631	$578,000	$503,200	12.10%
	Banks and others	$30,112	$19,100	$19,100	0.50%
	Carryover	$401,106	$366,056	$520,476	12.50%
	Total Revenues	**$3,831,108**	**$4,182,616**	**$4,155,861**	**100.00%**

Table 5.2 Per Pupil Revenue for Maine Indian Education Schools: FY 2013

	Resident (Subsidizable) Pupils			Total Revenues	Revenue Per
School	K-8	9-12	Total	FY 2013	Resident K-12 Pupil
Plesant Point	112	39	151	$5,246,361	$34,744
Indian Township	140	56	196	$5,546,681	$28,299
Indian Island	121	29	150	$4,155,861	$27,706

Note: Resident pupil count is based on October 2011 count per 279 forms

The mix of federal and state funding for the tribal schools is a result of the Maine Indian Claims Settlement Act of 1980, which states:

> Unless otherwise provided by federal law, in computing the extent to which the Passamaquoddy Tribe, the Penobscot Nation or the Houlton Band of Maliseet Indians is entitled to receive state funds for education under subsection 1, the state payment must be reduced by 15% of the amount of federal funds for school operations received by the respective tribe, nation or band within

> substantially the same period for which state funds are provided, and in excess of any local share ordinarily required by state law as a condition of state funding. A reduction in state funding for secondary education may not be made under this section except as a result of federal funds received within substantially the same period and allocated or allocable to secondary education. (Maine Indian Claims Settlement Act of 1980, p. 23)

Johnson O'Malley and Title VII funding outside of Maine Indian Education

There are two additional federally recognized tribes in the state that do not have reservations and are not served by Maine Indian Education. These are the Micmac and the Houlton Maliseet Band of Indians. The Houlton Band of Maliseet Indians are served by a Title VII program in Houlton run by SAD #29, while the Houlton Band's Education Department provides supplemental education services through Johnson O'Malley funding (Houlton Band of Maliseet Indians, n.d.). The Aroostook Band of Micmacs provides Title VII services in Presque Isle and Caribou, and also Johnson O'Malley supplemental education programs (Aroostook Band of Micmacs, n.d.).

INDIAN EDUCATION FUNDING IN OTHER STATES

There is no consistency in how states access, use and account for the funding they receive via the various federal Indian education funding streams. A survey of states around the nation, some of which have tribal schools, others of which serve their Indian students through Johnson O'Malley and Title VII funding, found most of the decisions around Indian education services and funding are made at the local district or tribal level, and there is almost no recognition in state budgets of the funds sent directly to tribal schools by the BIE. Below are several examples.

North Carolina

There are BIE-grant funded tribal day schools in North Carolina, collectively referred to as the Cherokee Central School, which includes an elementary, middle and high school. These schools are operated independently from the state. No BIE monies are exchanged or distributed to or through the state (Debora Williams, North Carolina Department of Public Instruction, personal communication, February 27, 2013).

Title VII federal funds to support Native American students are handled at the school or district level. Native American Advisory Boards are involved in determining which funds are applied for and how they are used to support Native American students in the public school system. Reporting on funds is portal controlled at the district level. Approximately 82% of the almost 21,000 students in North Carolina's public schools are in districts receiving Title VII-Indian Education funds (National Indian Education Association, 2011). However, these programs only serve students if parents opt for the services. Finally, there is one tribal charter school, the Haliwa Saponi Tribal School. As a public charter school it is state supported, and also receives Title VII funds.

New York State

There are no BIE-funded tribal schools in New York State. Schooling for American Indian students is fully funded by the State in the form of tuition, transportation and maintenance cost. Because Tribes are considered sovereign nations, New York State law mandates payment of a non-resident tuition rate. The State has tuition contracts with 13 public school districts, three reservation schools and four Boards of Cooperative Educational Services (BOCES) for students that live on nine Indian reservations; this includes transportation expenses. Districts receive supplemental services money to provide additional support for Native American students. Most districts in New York State receive school funds from local taxes. However, tribal lands cannot be taxed so the State pays the difference. Some tribes, such as the Oneida Indian Nation of New York, make voluntary contributions to local school districts in which they own land. (Adrian Cooke – Coordinator New York State Education Department Office of Native American Education, Personal Communication, February 26, 2013). Several tribes operate JOM-funded services; for example the Seneca Nation of Indians Department of Education works with the Gowanda Central School District to offer JOM Academic Assistance Services (Gowanda Central School District, 2013). As of 2011, Title VII programs in New York served over 4,600 students, approximately 35% of the state's K-12 indigenous population (National Indian Education Association, 2011).

Wisconsin

There are three BIE grant-funded schools operated by tribal entities in Wisconsin. BIE funds go directly to the schools and are entirely separate from the state budget; the state is not involved at all with tribal schools (Al Virnig, School Management Services, Wisconsin Department of Public Instruction, personal communication, February 27, 2013). Federal Impact aid in Wisconsin goes directly to schools and districts and does not appear in state budget reports (Bradley Adams, School Finance Services, Wisconsin Department of Public Instruction, personal communication, February 27, 2013). The level of impact aid is most significant in the Menominee Indian School District, a public school district located almost entirely on tribal lands. There are a number of JOM programs operated by tribes and districts throughout the state. The Menominee Indian Tribe operates a JOM program for its students in the district's public schools. The Ho-Chunk Nation serves students through JOM funds in sixteen Ho-Chunk communities. In 2011 Title VII Indian Education programs served almost 9,300 students in Wisconsin, over 70% of the state's K-12 American Indian population. Title VII funding was applied for by individual districts (National Indian Education Association, 2011).

Oregon

In Oregon there is one BIE-operated boarding school, and no tribal contract or grant schools. Twenty-nine of the 197 districts apply for Title VII funds. There is one Title VII competitive grant through Office of Indian Education, STEPS-State-Tribal Educational Partnership, which was applied for and received (Steve Woodcock, Education Specialist and Liaison to Oregon Tribes, personal communication, February 25, 2013).

There are tribal charter schools, but these are publicly funded and receive the same public funds as any other charter school in the state. Siletz Valley Charter School in Lincoln County School District is one of these. The school does receive supplemental funding direct from the Confederated Tribes of Siletz Indians, and also receives Title VII funds, which come through the District. Another charter school is the Nixyaawii Community School, which is located on the Confederated Tribes of the Umatilla Indian Reservation (Joe Novello, School Operations Administrator, Lincoln County School District, personal communication, March 1, 2013 and Sam Tupou, Principal Siletz Valley Charter Schools, personal communication, March 1, 2013).

The Confederated Tribes of Siletz Indians provide supplemental education programs in several districts through Johnson O'Malley funding, including the state's largest districts, Eugene, Portland and Salem.

Like Wisconsin, there are public schools located on tribal lands. Specifically, the Warm Springs Elementary School in Jefferson County School District is on Confederated Tribes of Warm Springs tribal land in a building that is owned by the Bureau of Indian Affairs. However, no funds are received from the BIE. The school is operated by the District, which pays for maintenance, upkeep and operations with state formula funding. Addition funding for the school comes from Impact Aid and Title VII. JOM services are provided via subcontract to the district from the Confederated Tribes. The district, BIA and tribe are negotiating a new agreement at this time with the Tribe and will be building a new school. This will be the third agreement over 30 or more years. Under the new agreement the Tribe and the District will lease the land from the BIA equally. The cost of building will be shared with the Tribe having 51% ownership (Martha Bewley, Chief Financial Officer, Jefferson County School District 509 J, personal communication, March 1, 2013).

Finally, Oregon has in place a statute enabling a school district to issue impact aid revenue bonds pursuant to an agreement between the school district board and the governing body of an Indian tribe whose reservation is located within the school district. The funds may be used to support capital improvements of the public school facilities on reservations, and for debt servicing (2011 Oregon Revised Statues, Vol. 9, Chapter 328).

Montana

In Montana, the BIE funds two tribal contract schools, and also operates one dormitory for students on the Blackfeet Reservation. The tribal schools are completely separate from the state schools in terms of funding, as are three Native language immersion schools (Montana Office of Public Instruction, 2013).

Montana funds Indian Education support services directly through the Indian Education for All program, and Indian Student Achievement Gap funding. Under Indian Education for All each district receives $20.40 per "Average Number Belonging" (ANB). As part of the American Indian Achievement Gap initiative school districts receive $200 extra for each American Indian student enrolled. (Montana Office of Public Instruction, 2011).

75 school districts receive over $38 million from Federal Impact Aid and the state has an extensive website to support districts interested in receiving this support. Title VII programs operate in most districts, serving over 13,500 students or over 80% of the state's K-12 Indian students in 2011. (National Indian Education Association, 2011). At least seven tribes across the state operate Johnson-O'Malley programs (Montana Office of Public Instruction, 2012).

HOW MAINE COMPARES AND RECOMMENDATIONS

With the exception perhaps of Montana, the tribal school and Indian education funding structures described above appear to be less a result of deliberate planning around the best way to address funding for Native American Children in each state, and more a result of individual tribal decisions, litigation outcomes, and federal funding requirements. None of the states we looked at closely had a funding structure similar to that of Maine, and in those with tribal schools, that funding was not at all reflected in state budget calculations or in any state budget documents. It is hard to assess advantages and disadvantages to the various approaches when there is little flexibility for the states in terms of the federal funding; they can only control their own state contributions if there are any (and few appear to be contributing to the tribal schools). It does not appear that any of the states see a reason to report federal funding for Indian schools when they have no control over the allocation and use of those funds.

It is important to note that the Maine Indian Claims Settlement Act of 1980 determines Maine's state funding structure for the Maine Indian Education tribal schools. This act mandated a particular relationship between the state and the federal funding for tribal schools. Other states also have unique fiscal relationships between state and tribal funding that are determined by other kinds of agreements; Oregon's agreement with the Confederated Tribes of Warm Springs is a distinct and particular arrangement. However, Maine's structure is codified in a legal agreement that would require federal as well as tribal agreement, to modify.

What Might Maine Do?

Aside from changing how tribal schools are funded, there are ways that districts in Maine could bring in more funds to support programs for indigenous students. First, the state could encourage districts to take advantage of available Title VII funds. As of 2010, there were 16 districts with between 10 and 20 American Indian students enrolled (not including those who identify as American Indian and another race under "two or more races"), only one of which we can confirm is receiving either Title VII or JOM funds. There are 13 districts with between 21 and 50 indigenous students (again, not including those who designate themselves as American Indian and another race), only 4 of which have JOM or Title VII-funded programs. Finally, of the five districts that enroll over 50 American Indian students, three are part of Maine Indian Education, while two, Calais and Bangor, are not. In particular, the growing number of Indian students in Bangor should be served, as well as those in Calais. Those districts could apply on their own or collaborate with one or more of the tribes in Maine; there is no requirement that the American Indians served under these funds be enrolled in any specific tribe.

Title VII Indian Education funding is supplemental funding from the U.S. Department of Education, and would not replace or diminish the funding the tribal schools receive from the

Bureau of Indian Education. Generally, schools receive about $300 per identified American Indian student, so it is not a large sum of money. However, in a district like Bangor, that could mean $20,000 toward support services for American Indian students (or more, depending on the race of the students self-identifying as mixed-race), which could be spent on a part-time counselor, or funding for cultural activities provided by tribal elders, a netbook for every student or any number of services that might improve student engagement, enhance student achievement or increase graduation rates. Districts with smaller numbers of Indian students could pool Title VII resources and share positions or jointly fund initiatives.

Likewise, districts could collaborate with tribes to extend services under Johnson-O'Malley funding, if the tribes were willing. These funds again are used for supplemental programs, and may not be used to supplant existing programs and services. There is not a requirement that students be enrolled in the tribe providing the services, just that they be eligible by the criteria described above. In Anchorage, Alaska, Cook Inlet Tribal Council serves any American Indian or Alaska Native student in their Johnson-O'Malley programs in Anchorage, regardless of their enrolled tribe, so long as they are eligible for the services. This may not be financially viable under the current JOM funding scheme, but it appears that the program may be revived and expanded. The state and its tribes should monitor the efforts to increase JOM funding at the national level and make sure that accurate counts of eligible children are provided to the Bureau of Indian Affairs.

The other decision the state needs to make is whether or not to do something different for those students that move from the tribal school system into the Maine public school system for high school. Has anyone tracked those students to see how they do in terms of achievement and graduation rates? Do some high schools appear to serve these students better than others? Would there be any value to developing targeted services for those students specifically or even to creating a secondary tribal school program, perhaps a school-within-a-school for some of these students. This is an area that needs further investigation.

In summary, our analysis of Tribal funding issues reaches the following conclusions:

- The three Maine Indian Education schools appear to receive total per pupil revenues that are substantially higher than the state average funding level.
- The mix of state and federal funding for the tribal schools in Maine is set by the Maine Indian Claims Settlement Act of 1980. It would require tribal and federal agreement to modify the Act.
- Most Maine school districts that are eligible for Title VII funds (districts serving 10 or more American Indian/Alaska Native students) do not receive the funds. Districts could apply for these moneys, generally about $300 per student, which are supplemental and can be used for a broad array of approaches to support indigenous students.
- The state of Maine should decide whether or not to provide a different set of options for secondary students exiting the tribal schools, depending on whether there is evidence about whether these students are succeeding in high school.
- The Committee may want to study spending patterns in the tribal schools more closely.

CHAPTER 6: COMPARATIVE ANALYSIS OF MAINE'S ESSENTIAL PROGRAMS AND SERVICES TO AN EVIDENCE-BASED ADEQUACY MODEL

In order to assess the core elements of the Essential Programs and Services (EPS)—the basis of the Maine school funding system—this comparative analysis views each core element through the lens of the Evidence-Based (EB) approach.[14] We have concluded that the formulas in the EB approach are adequate for schools to provide every student in Maine a comprehensive education program that covers the seven learning areas of English Language Arts, Mathematics, Science, Social Studies, the arts, world language, and health and physical education. To the extent that the EPS core elements are aligned to the EB formulas, ratios and numbers, state policymakers can be assured that schools have the resources necessary to provide this opportunity to all students. We also note that the EB approach includes such programs as career and technical education, gifted and talented services including Advanced Placement courses and co curricular activities, and programs not directly included in the EPS at the present time. As the following analyses show, in some areas the EB and EPS approaches are similar, but in others there are larger differences. Analysis of Maine's school funding system requires consideration of the voter-established goal of having the state fund 55% of the EPS computed funding level each year. Our framework is not designed to ascertain what the relative state/local share of overall funding should be because we view adequacy models like EPS and EB as estimates of the resources needed. Moreover, although both models include compensation costs such as educator retirement, social security, health care, how they are funded (by the state or by local districts) can impact the state share of total funding as well.

In the second phase of this study, we will develop a cost model to estimate the revenues needed to meet the components of the EB model and compare that to current EPS funding. A major part of that work will be interactive sessions with the Committee to ascertain their views as to whether the components we propose in the EB should be included in Maine's definition of a comprehensive education system as called for in the Resolve establishing this study. Once the funding level is determined, it will be possible to discuss the implications of different state/local distributions of total system funding.

THE EVIDENCE BASED APPROACH

A discussion of how the components of the EPS are computed is included in Chapter 2 of this report. Here we describe how the EB estimates adequate levels of resources for schools. The EB approach identifies a cohesive set of school-level resources, or elements, required to deliver a comprehensive and high-quality instructional program and describes the evidence on their individual and collective effectiveness. This approach then estimates an adequate expenditure level by placing a price on each element (e.g. an appropriate salary and benefits level for personnel) according to the needs of prototypical elementary, middle and high schools. School resources are added to the resources and staffing needs for the central office staff, including maintenance and operations. The final step involves aggregating the cost of all school- and district-level elements to a total statewide cost.

[14] This analysis draws heavily from Allan Odden and Lawrence O. Picus, *School Finance: A Policy Perspective, 5th Edition,* New York: McGraw Hill (2014).

The EB approach is based on a review of the research evidence, originating from three primary types of sources:

1. Research with randomized assignment to the treatment (the "gold standard" of evidence)
2. Research with other types of controls or statistical procedures that can help separate the impact of a treatment, including meta-analyses of these kinds of research
3. Best practices either as codified in a comprehensive school design (e.g., Stringfield, Ross & Smith, 1996) or from studies of schools that have dramatically improved student learning (e.g., Blankstein, 2010, 2011; Chenoweth, 2007; 2011; Odden, 2009; Odden & Archibald, 2009)

EB elements are organized into six (6) general categories:

A. Student counts, preschool, full-day kindergarten and school size
B. Staffing for the core programs
C. Additional staff for students with extra needs, such as special education, tutors, etc.
D. Additional staffing and resource needs, such as pupil support professionals, librarians, administrators, instructional materials, etc.
E. District resources, including central office staff, operations and maintenance[15]
F. Regional adjustments factors

Table 6.1 provides a summary of the comparison between Maine's EPS and the EB approach. Each element will be fully explained in the following sections. It is important to note that the EB approach relies on prototypical schools to allocate many resources. A prototypical elementary (K-5) school has 450 students (five classes of 15 students each in grades K-3 and 3 classes of 25 each in grades 4 and 5). A prototypical middle school has 450 students (150 students per grade) and a prototypical high school, 600 students (150 students per grade). For computing district level resources the EB uses a prototypical district of 4 elementary, 2 middle and 2 high schools with a total of 3,900 students. In general, resources allocated to actual schools are prorated based on the enrollment of each school if the formulas are used to resource each school in a state. An alternative approach is to use the EB formulas to determine a unique foundation level for each district, the approach Maine has been taken since adopting the EPS system.

[15] The report does not address transportation, food services, security or debt costs.

Table 6.1 Comparison of Maine EPS and Evidence-Based Model

	Element		Elementary		Middle School		High School	
			EB Model	Maine EPS	EB Model	Maine EPS	EB Model	Maine EPS
		School Configuration	K-5	K-5	6-8	6-8	9-12	9-12
Student Counts, Preschool, Kindergarten and School Size	A.2	Preschool	15:1 Ratio	Counted as full-day Kindergardent Students				
	A.3	Full Day Kindergarten	15:1 Ratio					
	A.4	School Size	450 pupils		450 pupils		600 pupils	
Adequate Staffing for the Core Programs	B.5	Class size for core teachers	Grades 1-3: 15 Grades 4-5: 25		25		25	NA
	B.6	Elective teachers	20% more than core		20% more than core		33% more than core	
	B.7	Instructional Coaches	1 per 200 pupils	$24 per pupil	1 per 200 pupils	$24 per pupil	1 per 200 pupils	$24 per pupil
		Core, elective and coach staffing ratio	1 to 13.45	1 to 17	1 to 18.87	1 to 16	1 to 17.1	1 to 15
Staffing for Extra Student Needs	C.8	Disadvantaged students		0.15 weight on SAU Per pupil		0.15 weight on SAU per pupil		0.15 weight on SAU per pupil
		Tutors	1 per 100 FRL pupils		1 per 100 FRL pupils		1 per 100 FRL pupils	
	C.9	Extended Day	1 per 120 FRL pupils times 0.25		1 per 120 FRL pupils times 0.25		1 per 120 FRL pupils times 0.25	
	C.10	Summer School	1 per 120 FRL pupils times 0.25		1 per 120 FRL pupils times 0.25		1 per 120 FRL pupils times 0.25	
	C.11	ELL(EB) or LEP(Maine)	1 per 100 LEP pupil	Weight Based on SAU Enrollment <15 = 0.7; 16-250 = 0.5; 251 or more = 0.525	1 per 100 LEP pupil	Weight Based on SAU Enrollment <15 = 0.7; 16-250 = 0.5; 251 or more = 0.525	1 per 100 LEP pupil	Weight Based on SAU Enrollment <15 = 0.7; 16-250 = 0.5; 251 or more = 0.525
	C.12	Special Ed: Mild & Moderate	1 teacher & 0.5 aide per 150 regular pupils	Weight of 1.27 plus adjustments for small districts	1 teacher & 0.5 aide per 150 regular pupils	Weight of 1.27 plus adjustments for small districts	1 teacher & 0.5 aide per 150 regular pupils	Weight of 1.27 plus adjustments for small districts
		Special Ed: Severe	100 % state funded minus Fed Title IVb		100 % state funded minus Fed Title IVb		100 % state funded minus Fed Title IVb	
	C.13	Gifted and Talented	$25 per regular pupil		$25 per regular pupil		$25 per regular pupil	
	C.14	Career and Technical	$9,000 per CTE teacher		$9,000 per CTE teacher		$9,000 per CTE teacher	
Additional Staffing and Resource Needs	D.15	Substitute Teachers	5% of all teachers	$36 per pupil	5% of all teachers	$36 per pupil	5% of all teachers	$36 per pupil
	D.16	Counselors	1 per 450	1 per 350	1 per 250	1 per 350	1 per 250	1 per 250
		Nurses	1 per 750		1 per 750		1 per 750	
		Additional Pupil support	1 per 100 FRL students		1 per 100 FRL students		1 per 100 FRL students	
	D.17	Instructional Aides		1 per 100 pupilsK-5 and 1 per 15 pupils for Pre-K classrooms		1 per 100 pupils	None	1 per 250 pupils
		Supervisory Aides	1 per 225 pupils		1 per 225 pupils		1 per 200 pupils	None
	D.18	Librarians	1 per 450 pupils	1 per 800 pupils	1 per 450 pupils	1 per 800 pupils	1 per 600 pupils	1 per 800 pupils
		Library Techs	None	1 per 500 pupils	None	1 per 500 pupils	None	1 per 600 pupils
	D.19	Principal	1 per 450 pupils	1 per 305 pupils	1 per 450 pupils	1 per 305 pupils	1 per 600 pupils	1 per 315 pupils
		Assistant Principal					1 per 600 students	None
	D.20	School Clerical	1 per 225 pupils	1 per 200 pupils	1 per 225 pupils	1 per 200 pupils	1 per 200 pupils	1 per 200 pupils
	D.21	Professional Development	a. Instructional Coaches		a. Instructional Coaches		a. Instructional Coaches	
			b. Collaboration time		b. Collaboration time		b. Collaboration time	
			c. 10 days of pupil free time for training		c. 10 days of pupil free time for training		c. 10 days of pupil free time for training	
			d. $100 / pupil for training	$57 / pupil	d. $100 / pupil for training	$57 / pupil	d. $100 / pupil for training	$57 / pupil
	D.22	Computer Technologies	$250 / pupil	$95 / pupil	$250 / pupil	$95 / pupil	$250 / pupil	$288 per pupil
	D.23	Instructional Materials & Assessments	$170 / pupil	$377 / pupil	$170 / pupil	$377 / pupil	$205 / pupil	$466 / pupil
	D.24	Student Activities	$250 / pupil	$33 / pupil	$250 / pupil	$33 / pupil	$250 / pupil	$111 / pupil
District Resources	E.25	Central Office		$215 / pupil		$215 / pupil		$215 / pupil
	E.26	Operations and Maintenance		$986 / pupil		$986 / pupil		$1,172 / pupil
Regional Adjustment Factor	F	Regional Adjustment Factor	Hedonic or Comparative Wage Index	Comparative Teacher Salaries	Hedonic or Comparative Wage Index	Comparative Teacher Salaries	Hedonic or Comparative Wage Index	Comparative Teacher Salaries

A. STUDENT COUNTS, PRESCHOOL, KINDERGARTEN AND SCHOOL SIZE

This section includes discussion of four elements: pupil counts for the state aid formula, preschool, full day kindergarten and school size. These elements serve to set the stage for the rest of the analysis as they define the parameters used—who is counted, how they are counted, and the assumptions we make regarding the prototypical school size.

A.1 Student Counts for Calculating State Aid

Current Maine Policy	Evidence-Based Model
Maine's EPS calculations use two different pupil counts, *attending* pupil counts and *subsidizable* or resident pupil counts for each district.	The EB approach supports Maine's use of the enrollment count of attending pupil for the aid formula.

Attending pupil counts are used to determine the EPS funding rate for elementary and secondary students. • They are based on the average April and October attending counts for the previous calendar year (for example, attending pupils for the 2012-13 fiscal year are computed as the average of the April and October 2011 attending counts). • To compute the per pupil unit allocation, the attending pupil counts are disaggregated by K-5, 6-8, and 9-12 for calculation of EPS determined staffing ratios, which vary by position and grade-level grouping. The K-8 pupil count includes 4-year olds (4YO), pre-kindergarten (Pre-K) and kindergarten students, all counted as 1.0 regardless of whether they attend a full or half day program. For non-staff costs, ratios and resources are determined separately for K-8 (including 4YO and Pre-K) and 9-12. • They include: (1) students from the local school district attending schools in the local school district, plus (2) students from outside the school district who are tuitioned-in from other school districts. *Subsidizable* or resident pupil counts are used to determine the distribution of funds. • They are computed separately for K-8 and 9-12 students and as the average of the three previous years' April and October enrolled pupil counts or the total October count for the previous year, whichever is greater. For example, for 2012-13, the subsidizable pupil count is the average of the April and October counts for 2009, 2010 and 2011, or the subsidizable pupil count in October 2011. • When computing each district's EPS	In addition, the EB approach would use the greater of a rolling three-year average pupil count (e.g., from CY 9, 10 and 11 for FY12-13 aid) or the actual (CY 11) pupil count for SAUs, which addresses both declining, stable or rising student counts. The EB approach would use the same pupil count for all elements of the funding system – determining property wealth per pupil, calculating state aid, counting the number of students in a school and school district, and calculating other aid elements.

funding total, computations are based on K-8 and 9-12 student groupings.	

Analysis and Evidence

Most states count students on some type of Full Time Equivalency basis (FTE) as applied either to enrollment, average daily membership (ADM) or average daily attendance (ADA). The EB approach recommends an FTE enrollment (the current Maine approach) or ADM count so that the aid system provides funding for all students in the district, even if they have intermittent attendance, which often requires additional rather than fewer services.

There are two additional issues a state needs to address in determining the pupil count. The first is whether to use a resident or attendance count of students, and the second is whether to use a multiple-year average student count to cushion the loss of aid when enrollments decline. With regard to the first of these, the growing popularity of choice programs (both within and across school district boundaries), and in states like Maine where many districts have some of their students educated in other districts, using counts of resident students complicates state aid calculations, particularly if an additional administrative system is needed to transfer dollars among districts to cover the costs of students who choose to attend school in a district other than the one in which they reside. The easiest way to address this issue is to count each student in the school (and district) attended. This ensures the dollars follow each student and eliminates the need for a potentially expensive and complicated administrative system for tracking funds across districts to accommodate school choice.

The second issue has to do with the fiscal impact of declining student enrollments, something that has impacted many Maine school districts in recent years. Reduced enrollments lead to lower pupil-based revenues, reductions that are often hard to accommodate in the short term. To help districts deal with enrollment declines, a common approach is to use a three-year rolling average student count. This approach was recommended by Cavin, Murnane & Brown (1985) in a Michigan study. However, a rolling three-year average was generally not intended for use in all schools, especially those schools experiencing enrollment growth. Schools with rising enrollments should be able to use their actual student count so they have the resources to expand educational services as they grow in students.

We recognize that a system that provides a “soft landing” for districts with declining enrollment, but also recognizes new enrollments as they occur, has the potential for creating “phantom” students; students who leave the state or enroll in another Maine district will be counted as a portion of a student in the district they leave until the three year average cycles through and as one student in their new district if they remain in the state. But we believe this is the approach to recognize the fiscal challenges districts face with declining student counts.

A.2 Preschool

Current Maine Policy	Evidence-Based Model
Preschool children are included in the regular K-5 and K-8 pupil counts at a teacher staffing ratio of 1 to 17 and an aide (educational technician) ratio of 1 per 90 students. All other resources are provided at the same level as for all elementary school students. Maine also provides an additional weight of 0.1 for K-2 students, which include the 4-year-old and preschool counts. Enrolled, four-year-olds (4YO) and Pre-K (PK) students are included in this count as 1.0 attending pupil, even if enrolled less than full time.	1 FTE teacher and 1 FTE instructional aide (education technician) position for every 15 preschool students. These staff FTE are added to the core teacher counts (Element B.5) and then used to generate elective teacher positions, professional development, pupil support and other school wide resources, as discussed below. This allows elementary schools to fully integrate the preschool program into the school, and to create an early childhood teacher team of PK, K and grade 1 and 2 teachers.

Analysis and Evidence

Research shows that high quality preschool, particularly for students from lower income backgrounds, significantly affects future student academic achievement as well as other desired social and community outcomes (Barnett, 2011; Camilli, et. al., 2010; Reynolds, et al., 2001, 2011; Schweinhart et al., 2005). Longitudinal studies show that students from lower income backgrounds who experience a high quality, full-day preschool program perform better in learning basic skills in elementary school, score higher on academic goals in middle and high school, attend college at a greater rate, and as adults, earn higher incomes and engage in less socially-undesirable behavior. The research shows that there is a return over time of *eight to ten dollars* for every one dollar invested in high quality preschool programs (Barnett, 2007; Barnett & Masse, 2007; Karoly et al., 1998; Reynolds et al., 2011).

In addition, a 2003 study of state-funded pre-school programs in six states – California, Georgia, Illinois, Kentucky, New York and Ohio – found, that children from lower income families start catching up to their middle income peers when they attend a pre-school program (Jacobson, 2003). A 2007 study showed that preschool programs in New Jersey's urban districts had not only significant short-term cognitive and social impacts, but also long term, positive impacts on students who enrolled in them, closing the achievement gap by 40 percent in second grade for a two year preschool program (Frede, Jung, Barnett et al., 2007).

High quality preschool, offered for a full day and taught by fully certified and trained teachers using a rigorous but appropriate early childhood curriculum can provide initial effects of 0.9 standard deviation that fall to 0.45 in later primary years. The impact falls in latter elementary years largely because of extra supports provided by compensatory education programs that enhance performance of children who did not have preschool experiences. By themselves, preschool programs can reduce achievement gaps linked to race and income by half. Furthermore, there is increasing recognition that preschool should be provided for all students.

Research shows that this strategy produces significant gains for children from middle class backgrounds and even larger impacts for students from lower income backgrounds (Barnett, Brown & Shore, 2004).

Preschool impact is linked to quality and quality is largely a function of staff (Camilli, et al., 2010; Whitebrook, 2004). Therefore, including preschool students in a district's pupil count for state aid purposes and including preschool teachers on the same salary schedule as teachers of other grades is the most straight-forward way to fund preschool services. At the same time, if this funding and salary approach is followed, districts should be encouraged to allow multiple institutions and organizations to provide preschool services, not just the public schools.

Given these research findings, the EB model supports full-day preschool for 3 and 4-year-olds, at least for children from families with an income at or below 200 percent of the poverty level.

A.3 Full Day Kindergarten

Current Maine Policy	Evidence-Based Model
Kindergarten students are counted as 1.0 attending pupils, even if enrolled in a part day kindergarten program (something that is highly unusual in Maine today).	Kindergarten students are counted as 1.0 students for the state aid formula. The staff FTE these students generate are added to the core teacher counts (Element B.5) and then used to generate elective teacher positions, professional development, pupil support and other school wide resources, as discussed below.

Analysis and Evidence

Research shows that full-day kindergarten, particularly for students from low-income backgrounds, has significant, positive effects on student learning in the early elementary grades (Gullo, 2000; Slavin, Karweit & Wasik, 1994). Fusaro's (1997) late 1990s meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs, found an average effect size of +0.77, which is quite substantial. Children participating in full-day kindergarten programs do better in learning the basic skills of reading, writing, and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all.

In 2003, using nationally-representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS–K), Denton, West & Walston (2003) showed that children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. Cooper, et al.'s (2010) comprehensive meta-analysis reached similar conclusions finding the average effect size of students in full day versus half-day kindergarten to be +0.25. Moreover, a randomized control trial, the "gold standard" of education research, found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviations (Elicker & Mathur, 1997). As a result of this research, funding full day kindergarten for 5 year-olds as well as for 4 year-olds is an increasingly common practice among the states (Kauerz, 2005).

Since research suggests that children from all backgrounds can benefit from full-day kindergarten programs, the EB model provides support for a full day program for all students, by counting such students as 1.0 in the state aid formula.

A.4 School Size for Purpose of Estimating Resources

Current Maine Policy	Evidence-Based Model
Resources are allocated to SAUs on the basis of enrollment ratios and no prototypical school sizes are in current use. Note: The EPS system was initially developed using a set of prototypical school units of: • 250 student K-5 elementary schools • 400 student 6-8 middle schools • 500 student 9-12 high schools	To indicate the relative level of resources in schools, we recommend prototypical school units of: • 450 student K-5 elementary schools (If PK students are included, they are added to this total based on the number served) • 450 student 6-8 middle schools • 600 student 9-12 high schools Most resources are estimated at the school level and then aggregated up to the district level. A prototypical district size is also identified below (Element E.25) in order to estimate district resources.

Analysis and Evidence

School sizes differ substantially within and across all states. No states have a specific school policy on school size, though some – including Maine (in the past), New Jersey and Wyoming – have prototypical schools sizes for developing and/or operating their funding formula, and many others include "ideal" size configurations for different levels of schools in their facility guidelines.

Research on school size is clearer than research on class size. Most of the research on school size addresses the question of whether large schools – those significantly over 1,000 students – are both more efficient and more effective than smaller school units (schools of 300 to 500) – and whether cost savings and performance improvements can be identified by consolidating small schools or districts into larger entities. The research generally shows that school units of roughly 400-600 elementary students and between 500 and 1,000 secondary students are the most effective and most efficient (Lee & Smith, 1997; Raywid, 1997/1998).

The research on diseconomies of small and large scale, which needs to assess both costs and outcomes, generally does not provide solid evidence for a consolidation policy. From an economic perspective, the concept of diseconomies of scale includes both costs and outputs. In an early 1981 review of the literature, Fox (1981) concluded that little research had analyzed output in combination with input and size variables. Ten years later, after assessing the meager extant research that did address costs as well as outcomes, Monk (1990) concluded that there was little support for either school or district consolidation.

Related analyses, moreover, found that the expected cost savings from school and district consolidation programs that have been implemented have not been realized (Guthrie, 1979; Ornstein, 1990) and that consolidation might actually harm student performance in rural schools (Sher & Tompkins, 1977) as well as have broad negative effects on rural communities (Coeyman, 1998; Seal & Harmon, 1995).

In more recent reviews of scale economies and diseconomies and potential cost savings from consolidation, Andrews, Duncombe & Yinger (2002) and Duncombe and Yinger (2010) found that the optimum size for elementary schools was in the 300-500 pupil range, and for high schools was in the 600-900 range. Both findings suggest that the very large urban districts and schools across America are far beyond the optimum size and perhaps need to be downsized somehow, and that the potential cost savings from consolidation are realistically scant. In sum, the research suggests that elementary school *units* be in the range of 400-500 students and that secondary school *units* be in the range of 500-1,000 students.

The EB approach starts by identifying resources for prototypical elementary, middle and high schools with enrollments of 450, 450 and 600 respectively. It uses this approach and these prototypes to indicate the relative level of resources in schools. These prototypical school sizes reflect research on the most effective school sizes, although in reality few schools are exactly the size of the prototypes. As a result, the general formulas are designed, as is Maine's current EPS system, in a way that they can be proportionately reduced or increased based on how a school's enrollment compares to the prototypical models. The model also can be used to estimate a district level revenue per pupil figure. Further, when actual school sizes are substantially larger than the prototypes, the EB suggest that schools divide themselves into schools-within-schools, and have the individual schools-within-schools operate as semi-independent units. The EB proposals should not be construed to imply that Maine needs to replace all school sites with smaller (or larger) buildings.

The EB model also makes adjustments for districts and schools with enrollments much smaller than the above prototypes, down to districts with 97 or fewer students (See Table 6.12).

B. ADEQUATE STAFFING FOR THE CORE PROGRAMS IN PROTOTYPICAL SCHOOLS

This section covers personnel staffing for the major elements of the regular education program: core teachers, elective teachers, and instructional coaches.

B.5 Core Teachers/Class Size

Current Maine Policy	Evidence-Based Model
Staffing ratios for teachers, which includes both core and elective subject teachers, are: • 17 to 1 for elementary schools* • 16 to 1 for middle schools	Staffing ratios for **core teachers** are: • 15 to 1 for grades K-3 • 25 to 1 for grades 4-12

• 15 to 1 for high schools Maine's staffing ratios do not explicitly address the issue of class size or the mix of core and elective teachers. *A weight of 0.1 for K-2 students has the effect of decreasing that ratio slightly depending on the number of K-2 students in a district.	Core teachers are defined as the grade-level classroom teachers in elementary schools and the core subject (e.g., mathematics, science, language arts, social studies and world language including such subjects taught as Advanced Placement in high schools) teachers in middle and high schools. Elective teachers are discussed in the next section (Element B.6). Additional teacher resources for specific student needs are also discussed below (Elements C8-C14).

Analysis and Evidence

In staffing schools and classrooms, the most expensive decision superintendents and principals make is on class sizes.

The gold standard of educational research is randomized controlled trials, which provide scientific evidence on the impact of a certain treatment (Mosteller, 1995). Thus, the primary evidence on the impact of small classes today is the Tennessee STAR study, which was a large scale, randomized experiment of class sizes of approximately 15 compared to a control group of classes with approximately 24 students in kindergarten through grade 3 (Finn and Achilles, 1999; Word, et al., 1990). The study found that students in the small classes achieved at a significantly higher level (effect size of about 0.25 standard deviations) than those in regular class sizes, and that the impacts were even larger (effect size of about 0.50) for low income and minority students (Finn, 2002; Grissmer, 1999; Krueger, 2002). The same research also showed that a regular class of 24-25 with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and wide spread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

Subsequent research showed that the positive impacts of the small classes in the Tennessee study persisted into middle and high school years, and even the years beyond high school (Finn, Gerger, Achilles & J.B. Zaharias, 2001; Konstantopulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges & Konstantopulos, 2001a, 2001b). Longitudinal research on class size reduction also found that the lasting benefits of small classes can include a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Although some argue that the impact of the small class sizes is derived primarily from kindergarten and grade 1, Konstantopoulos and Chung (2009) found that the longer students were in small classes (i.e., in grades K, 1, 2 and 3) the greater the impact on grade 4-8 achievement. They concluded that the full treatment – small classes in all of the first four grades – had the greatest short and long term impacts.

While differences in analytic methods and conclusions characterize some of the debate over class size (see Hanushek, 2002 and Krueger, 2002), we side with those concluding that class size does make a difference, but only class sizes of approximately 15 students with one teacher (and not

class sizes of 30 with an aide or two teachers) and only for kindergarten through grade 3.

Evidence on the most effective class sizes in grades 4-12 is harder to find. Most of the research on class size reduction has been conducted at the elementary level. Thus, we look for evidence on the most appropriate secondary class size from typical and best practices to make a decision on class sizes for these grades. First, the national average class size in middle and high schools is about 25. Second, nearly all comprehensive school reform models are developed on the basis of a class size of 25 (Odden, 1997a; Stringfield, Ross & Smith, 1996), a conclusion on class size reached by the dozens of experts who created these whole-school design models. Although many professional judgment panels in other states have recommended secondary class sizes of 20, none cited research or best practices to support such a proposal.

Finally in these times when funds for schools are scarce, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Cringos (2011) argue that though the Tennessee STAR study supports the efficacy of small classes, there is other research today that produced more ambiguous conclusions. However, they also note that the other research includes class size reductions in grades above K-3 and "natural experiments" rather than randomized controlled trials. They also conclude that while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and conclude that small class sizes "pay their way."

B.6 Elective Teachers and Preparation Time/Collaborative Professional Development

Current Maine Policy	Evidence-Based Model
Staffing ratios for teachers, which includes both core and elective subject teachers, are: • 17 to 1 for elementary schools • 16 to 1 for middle schools • 15 to 1 for high schools The Maine system does not address specific staffing ratios for elective versus core teachers. As a result, the amount of time that teachers have for planning and preparation are not overtly addressed in the current structure.	Resources for elective teachers are provided in addition to the number of core teachers, at the following rate: • 20 percent for elementary teachers • 20 percent middle school teachers • 33 percent high school teachers We define elective teachers as all teachers for subject areas not included in the core. For example, art, music, physical education, health, and career and technical education, etc. Core teachers are discussed in the previous section (Element B.5). Additional teacher resources for specific student needs are also discussed below (Elements C8-C14).
Analysis and Evidence	
In addition to the core subjects addressed above, schools need to provide a solid well rounded curriculum including art, music, library skills, career-technical and physical education.	

Teachers also need some time during the regular school day to work collaboratively and engage in job-embedded professional development. Providing every teacher one period a day for collaborative planning and focused professional development requires an additional 20 percent allocation for elective teachers. Using this elective staff allocation, every teacher – core and elective – would teach 5 of 6 periods during the day, and have one period for planning, preparation and collaborative work. One of the most important elements of effective collaborative work is team-focused data-based decision making, using student data to improve instructional practices, now shown to be effective by a recent randomized control trial (Carlson, Borman & Robinson, 2011).

The 20 percent additional staff is adequate for elementary and middle schools, but a different argument can be made for high schools. If the goal is to have more high school students take a core set of rigorous academic courses, and learn that material at a high level of thinking and problem solving, one could argue from cognitive research findings (Bransford, Brown and Cocking, 1999; Donovan & Bransford, 2005a, 2005b, 2005c) that a block schedule that allows for longer class periods is a better way to organize the instructional time of the school. Typical block scheduling for high schools would require elective teachers at a rate of 33 percent of the number of core teachers, so the school can create a schedule with four 90-minute blocks where teachers provide instruction for three of those 90-minute blocks and have one block – or 90 minutes – for planning, preparation and collaboration each day. This type of block schedule could be operated with students taking four courses each semester attending the same classes each day, or with students taking eight courses each semester while attending different classes every other day. Such a schedule could also entail a few "skinny" blocks (45 minute periods) for some classes. Each of these specific ways of structuring a block schedule, however, would require an additional 33 percent of the number of core teachers to serve in the role of elective teachers to provide the regular teacher with a "block" for planning, preparation and collaboration each day.

In totaling the core plus the elective teachers from the recommendations above, the total teaching staff is 31.2 for the prototypical 450 FTE elementary, 21.6 for the 450 FTE middle and 32 for the prototypical 600 FTE high school. This reflects an overall staffing ratio of 14.4 to 1 for elementary schools, 20.8 to 1 for middle schools, and 18.75 to 1 for high schools, thus producing a lower ratio for elementary schools (and thus more elementary teacher staff) and higher ratios for middle and high schools (and thus fewer middle and high school teacher staff).

B.7 Instructional Coaches/Technology Coordinators

Current Maine Policy	Evidence-Based Model
There is no provision for instructional coaches. Resources are provided at a rate of $24 per pupil for instructional leadership support.	EB provides one instructional coach position for every 200 students. The EB model does not specifically fund technology positions, however, schools and districts can use coaching positions to fulfill a technology role if needed.

Analysis and Evidence

Only a Few states (e.g., Arkansas, New Jersey and Wyoming) explicitly provide resources for school and classroom-based instructional coaches, yet instructional coaches are key to making professional development work (see Element D.21 below). Most comprehensive school designs (see Odden, 1997; Stringfield, Ross & Smith, 1996), and EB studies conducted in other states – Arizona, Arkansas, Kentucky, North Dakota, Washington and Wisconsin – call for school-based instructional facilitators or instructional coaches (sometimes called mentors, site coaches, curriculum specialists, or lead teachers).

These individuals coordinate the instructional program but most importantly provide the critical ongoing instructional coaching and mentoring that the professional development literature shows is necessary for teachers to improve their instructional practice (Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means that they spend the bulk of their time in classrooms, modeling lessons, giving feedback to teachers, and helping improve the instructional program. We expand on the rationale for these individuals in the section on professional development (D.21), but include them here as they represent teacher positions. The few instructional coaches who also function as school technology coordinators would provide the technological expertise to fix small problems with the computer system, install all software, connect computer equipment so it can be used for both instructional and management purposes, and provide professional development to embed computer technologies into the curriculum at the school site.

Early research found strong effect sizes (1.25-2.71) for coaches as part of professional development (Joyce & Calhoun, 1996; Joyce & Showers, 2002). A 2010 evaluation of a Florida program that provided reading coaches for middle schools found positive impacts on student performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision making initiative also improved both teachers' instructional practice and student achievement (Marsh, McCombs & Martorell, 2010). More importantly, a recent randomized control trial of coaching (Pianta, Allen & King, 2011) found significant, positive impacts in the form of student achievement gains across four subject areas – mathematics, science, history and language arts. This gold standard of research provides further support to this element as an effective strategy to boost student learning.

In terms of numbers of coaches, several comprehensive school designs suggest that while one facilitator might be sufficient for the first year of implementation of a school-wide program, additional facilitators are needed in subsequent years. Moreover, the technology designs recommend a full-time facilitator who spends at least half-time as the site's technology expert. Thus, drawing from all programs, we conclude that 1.0 FTE instructional coaches/technology coordinators are needed for every 200 students in a school. This resourcing strategy works for elementary as well as middle and high schools.

This translates into 2.25 FTE instructional coaches for the 450-student prototypical elementary school, 2.25 FTE instructional coaches for the 450-student middle school, and 3.0 FTE instructional coaches for the 600-student high school.

Although instructional coaching positions are identified as FTE positions, schools could divide

the responsibilities across several individual teachers. For example, the 2.25 positions in elementary schools could be structured for 4 teacher/instructional coaches providing instruction 50 percent of the time, and functioning as a curriculum coaches in reading, mathematics, science and technology for 50 percent of the time. The same allocation of functions across individuals could work for the middle and high schools.

We also note that the above staff, combined with the additional elements of professional development discussed below, focus on making Tier 1 instruction (in the Response to Intervention frame) as effective as possible, thus providing a solid foundation of high quality instruction for everyone, including students who will struggle more to learn to proficiency.

C. STAFFING FOR EXTRA STUDENT NEEDS

Because not all students will learn to performance standards with just the core instructional program, districts and schools need a powerful sequence of additional and effective strategies for struggling students. The EB approach identifies a series of specific, extra-help programs for struggling students including:

- Tutoring to provide immediate, intensive assistance to keep struggling students on track
- Extended day programs to provide more time on task for struggling students
- Summer school to provide more instructional time for struggling students
- Sheltered English and ESL instruction for English Language Learning (ELL) students
- A new approach to funding special education

These programs all extend the learning time for struggling students in focused ways. The key concept is to implement the maxim of standards-based education reform: keep standards high for all students but vary the instructional time so all students can achieve to proficiency levels.

The EB elements for extra help are also embedded in the "response to intervention" schema.

- Tier 1 includes the regular instruction provided to all students. The proposals for class size, time for collaborative work during regular school hours and ongoing, systemic professional development are designed to make core instruction as effective as possible.
- Tier 2 includes the staffing for tutoring, extended day and summer school, with the tutoring staff covering nearly all possible small group Tier 2 intervention programs.
- Tier 3 includes ELL and special education which provides the more intensive extra help services for these special populations.

For tutors, extended day and summer school, the EB model uses the number of students eligible for free and reduced-price lunch to estimate the number of students who might need extra help to achieve to standards in each school. However, because not all eligible high school students apply for the free and reduced price lunch program, suggesting this strategy might undercount eligible high school students, the EB model encourages states to adjust the high school figures to more accurately reflect the actual number of qualifying students in each school.

C.8 Tutoring

Current Maine Policy	Evidence-Based Model
Maine applies a student weight for economically disadvantaged students in order to provide additional resources for these students. The additional dollars are determined by the following Steps: 1. multiply the percentage of K-8 pupils eligible for free and reduced lunch by the subsidizable K-8 or 9-12 pupils 2. multiply the result of Step 1 by the EPS determined weight (0.15 in 2012-13) 3. multiply the result of Step 2 by the Elementary or Secondary EPS rate for the SAU. For example, at an EPS rate of $6,570 (elementary/middle) and $6,905 (high school), a weight of 0.15 produces an extra $985.50 per K-8 student qualifying for free or reduced price lunch (0.15 x $6570) and an extra $1,035.75 per (inferred) 9-12 student qualifying for free or reduced price lunch (0.15 x $6,905). Resources generated through this student weight do not have to be used for tutoring, but may be used for a variety of resources, including those discussed in Elements C.9 and C10 below.	One (1) fully licensed teacher-tutor position for every 100 attending pupils eligible for free and reduced price lunch as counted in the State's funding formula. Tutors are not the only resources in the EB model aimed at struggling students. See Elements C.9 and C.10 below for a discussion of extended day and summer school resources.

Analysis and Evidence

The most powerful and effective extra help strategy to enable struggling students to meet state standards is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels (i.e. students who are ELL, low income, or have minor disabilities) especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g. the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Shanahan, 1998; Wasik & Slavin,1993; Cohen, Kulik & Kulik, 1982) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on how they are staffed and organized, their relation to

the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes the following:

- Professional teachers as tutors
- Tutoring initially provided to students on a one-to-one basis
- Tutors trained in specific tutoring strategies
- Tutoring tightly aligned to the regular curriculum and to the specific learning challenges, with appropriate content specific scaffolding and modeling
- Sufficient time for the tutoring
- Highly structured programming, both substantively and organizationally.

We note several specific structural features of effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive activity, individual teachers might spend only half their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive 1-1 tutoring.). Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools.
- Second, most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, close to half the student body of a 400-pupil school unit could receive individual tutoring during the year.
- Third, not all students who are from a low-income background require individual tutoring, so a portion of the allocation could be used for students in the school who might not be from a lower income family but nevertheless have a learning issue that could be remedied by tutoring.

While this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring say, at or below the 20^{th} or 25^{th} percentile on a norm referenced test. Intensive instruction for groups of three-to-five students would then be provided for students above that level but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help, needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004: 12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own.

> For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at-risk children in kindergarten, first grade and second grade …..only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire work-reading skills at grade level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one- to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, a one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group, and 30+ students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though we have emphasized 1-1 tutoring, and some students need 1-1 tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect, unfortunately, is smaller as it is much more difficult to undo the lasting damage of not learning to read when students enter middle and high schools with severe reading deficiencies.

An important issue is how many tutors to provide for schools with differing numbers of at-risk students. Drawing from the standard of many comprehensive school designs and the above discussion of service levels, the EB model provides one fully licensed teacher-tutor position for every 100 attending pupils eligible for free and reduced price lunch.

Using the prototypical schools, this standard would provide from one to four and a half professional teacher-tutor positions for the prototypical elementary and middle schools, and up to six for the prototypical high school, the maximum number being reached only if all students in a school are eligible for free and reduced lunch. Tutors also are provided the additional days for

professional development discussed below and as well as substitute days.

C.9 Extended-day programs

Current Maine Policy	Evidence-Based Model
There is nothing in the funding formula specifically providing extended-day resources, but districts can use the funds from the economically disadvantaged student weight discussed in Element C.8 for such instructional services	One (1) teacher position for every 30 attending free and reduced-price lunch students (or 3.33 FTE per 100 such students).. • Position is paid at the rate of 25 percent of the position's annual salary—enough to pay a teacher for a 2-hour extended-day program, 5 days per week. • This formula equates to 1 teacher position for every 120 free and reduced price lunch students. These resources could be used for a different mix of teachers and other non-certified staff, with teachers providing at least one hour of homework help or after school tutoring. These positions are provided additional days for professional development (Element D.21) and substitute days (Element D.15) discussed below.

Analysis and Evidence

At both elementary and secondary school levels, some struggling students are likely to benefit from after-school or extended-day programs, even if receiving Tier 2 interventions during the regular school day. Extended day programs are created to provide academic support as well as to provide a safe environment for children and adolescents to spend time after the school day ends.

In a review of research, Vandell, Pierce and Dadisman (2005) found that well designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (see also Fashola, 1998; Posner & Vandell, 1994). On the other hand, the evaluation of the 21st Century Community Learning Centers (CCLC) Program (James-Burdumy et al., 2005), though hotly debated, indicated that for elementary students, extended day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce & Dadisman, 2005) argued that the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. They also argued that the small impacts that were identified had more to do with lack of full program implementation during the initial years than with the strength of the program.

Overall, studies have documented positive effects of extended day programs on the academic performance of students in select after-school programs. However, the evidence is mixed both because of research methods (few randomized trials), poor program quality and imperfect implementation of the programs studied. Researchers have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program, staff expertise; staff stability/turnover; compensation; institutional supports)
- Program/group size and configuration (enrollment size, ages served, group size, age groupings and child staff ratio) and a program culture of mastery
- Financial resources and budget (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery; curricular resources in relevant content areas; location that is accessible to youth and families)
- Program partnerships and connections (with schools to connect administrators, teachers and programs; with larger networks of programs, with parents and community)
- Program sustainability strategies (institutional partners, networks, linkages; community linkages that support enhanced services; long term alliances to ensure long term funding).

The resources recommend in the EB model would be used to provide struggling students in all elementary grades and in secondary schools with additional help during the school year but before or after the normal school day. Because not all low income students will need or will attend an after school program, the EB model assumes 50 percent of the free and reduced-price lunch eligible pupils will attend the program -- a need and participation figure identified by Kleiner, Nolin and Chapman (2004). As a result providing resources at a rate of 1 FTE teacher to 30 free and reduced price lunch students will result in class sizes of approximately 15 in extended day programs.

C.10 Summer School

Current Maine Policy	Evidence-Based Model
There is nothing in the funding formula specifically providing resources for summer school. However, SAUs can operate summer schools through local and tuition funding.	One (1) teacher position for every 30 attending free and reduced-price lunch students (or 3.33 FTE per 100 such students). • Position is paid at the rate of 25% of salary, which also provides time for planning and preparation and collaborative work. • This formula equates to 1 teacher position for every 120 free and reduced price lunch students. These positions are provided additional days for professional development (Element D.21) and substitute days (Element D.15) discussed below.

Analysis and Evidence
Many students need extra instructional time to achieve their state's high proficiency standards. Thus, summer school programs should be part of the set of programs available to provide struggling students the additional time and help they need to achieve to standards and earn academic promotion from grade to grade (Borman, 2001). Providing additional time to help all students master the same content is an initiative that is grounded in research (National Education Commission on Time and Learning, 1994). Research dating back to 1906 shows that students, *on average*, lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay, & Greathouse, 1996). Summer breaks have a larger deleterious impact on poor children's reading and mathematics achievement. This loss can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). A longitudinal study by Alexander and Entwisle (1996) showed that these income-based summer learning differences *accumulate* over the elementary school years, such that poor children's achievement scores – without summer school – fall further and further behind the scores of middle class students as they progress through school grade by grade. As a result of this research, there is emerging consensus that what happens (or does not happen) during the summer can significantly impact the achievement of students from low-income and at-risk backgrounds, and help reduce (or increase) the poor and minority achievement gaps in the United States (see also Heyns, 1978). However, evidence on the effectiveness of summer programs in attaining either of these goals is mixed. Though past research linking student achievement to summer programs shows some promise, several studies suffer from methodological shortcomings and the low quality of the summer school programs themselves (Borman & Boulay, 2004). A meta-analysis of 93 summer school programs (Cooper, Charlton, Valentine, & Muhlenbruck, 2000) found that the average student in summer programs outperformed about 56% to 60% of similar students not receiving the programs. However, the certainty of these conclusions is compromised because only a small number of studies (e.g., Borman, Rachuba, Hewes, Boulay & Kaplan, 2001) used random assignment, and program quality varied substantially. Other randomized trial research of summer school reached more positive conclusions about how such programs can positively impact student learning (Borman & Dowling, 2006), and Roberts (2000) found an effect size of 0.42 in reading achievement for a randomized sample of 325 students who participated in the Voyager summer school program. Researchers note several program components related to improved achievement effects for summer program attendees, including: • Early intervention during elementary school • A full 6-8 week summer program • A clear focus on mathematics and reading achievement, or failed courses for high school students • Small-group or individualized instruction • Parent involvement and participation • Careful scrutiny for treatment fidelity, including monitoring to ensure good instruction in

reading and mathematics is being delivered
- Monitoring student attendance

Summer programs that include these elements hold promise for improving the achievement of at-risk students and closing the achievement gap.

In sum, research generally suggests that summer school is needed and can be effective for at-risk students. Studies suggest that the effects of summer school are largest for elementary students when the programs emphasize reading and mathematics, and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics.

Because summer school can produce powerful impacts, the EB model provides resources for summer school for classes of 15 students, for 50 percent of all free and reduced price lunch students in all grades K-12, an estimate of the number of students still struggling to meet academic requirements (Capizzano, Adelman & Stagner, 2002). The model provides resources for a program of eight weeks in length, class sizes of 15 students, and a six-hour day, which allows for four hours of instruction in core subjects. A six-hour day would also allow for two hours of non-academic activities. The formula would be one FTE position for every 30 free and reduced price lunch students or 3.33 per 100 such students. Because not all low income students will need or will attend a summer school program, the EB model assumes 50 percent of the free and reduced-price lunch eligible pupils will attend the program -- a need and participation figure identified by Kleiner, Nolin and Chapman (2004). As a result providing resources at a rate of 1 FTE teacher to 30 free and reduced price lunch students will result in class sizes of approximately 15 in summer school programs. Although a summer school term of six weeks will have fewer hours than five day a week extended day programs, we continue to fund this at the same rate to allow for teacher planning time for the summer school program – something that is less needed in extended day programs. Simplified, the EB summer school formula equates to 1 teacher position for every 120 free and reduced price lunch students.

As the discussion to this point shows, the EB approach to overall staffing for most at-risk or disadvantaged students is a sequenced set of connected and structured programs that begin in the early elementary grades and continue through the upper elementary, middle and high school levels. For the most academically deficient educationally disadvantaged students, the EB model first provides one-to-one tutoring, and provides those who are not struggling as much intensive and explicit instruction in groups of three or five. For students who are still struggling to meet proficiency standards the EB model provides an extended day program that includes an academic focus, and that children needing even more help are then offered a summer school program that is structured and focused on academics – reading and mathematics for elementary and middle school students, and failed courses for high school students. Students who are both at-risk and ELL not only all receive these services but also receive ESL classes, which is discussed next.

C.11 English Language Learning (ELL) Students

Current Maine Policy	Evidence-Based Model
Maine currently provides additional resources for students for whom English is not their first language through a student weight for limited English proficient (LEP) students. The extra dollars are determined by multiplying the number of LEP pupils by a variable weight and then multiplying that figure by the Elementary or Secondary EPS rate for the SAU. The weight varies depending on the number of LEP students in a SAU as follows: • 0.7 for SAUs with 15 or fewer LEP students • 0.5 for SAUs with 16 to 250 LEP students • 0.525 for SAUs with more than 250 LEP students Assuming EPS rates of $6,570 for elementary students, the LEP weight would produce additional funding between $3,375 and $4,725 per subsidizable LEP pupil. Assuming a high school EPS rate of $6,950, the weights would produce additional funding of between $3,452 and $4,833 per subsidizable LEP pupil.	One (1) FTE teacher position for every 100 attending ELL students. • For students who are both ELL and eligible for free and reduced price lunch, the ELL resources are *in addition* to the resources in Elements C.8-C10 (tutoring, extended day, summer school) and additional pupil support (Element D.16). These positions are also provided additional days for professional development (Element D.21) and substitute days (Element D.15) discussed below.

Analysis and Evidence

Research, best practices and experience show that English language learners (ELL) need assistance to learn English, in addition to instruction in the regular content classes. This can include some combination of small classes, English as a second language classes, professional development for teachers to help them teach "sheltered English classes, and "reception" centers for districts with large numbers of ELL students who arrive at the school throughout the year.

Good ELL programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. However, bilingual education is difficult to provide in most schools because students come from so many different language backgrounds.

In a best-evidence synthesis of 17 studies on bilingual education, Slavin & Cheung (2005) found that ELL students in bilingual programs outperformed their non-bilingual program peers. Using

studies focused primarily on reading achievement, the authors found an effect size of +0.45 for ELL students. A more recent randomized control trial also produced strong positive effects for bilingual education programs (Slavin, et al., 2011), but concluded that the language of instruction is less important than the approaches taken to teach reading.

In *The Elementary School Journal,* Gersten (2006) concludes that ELL students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary and reading comprehension. Gersten's studies also showed that ELL students benefit from instructional interventions initially designed for monolingual English speaking students, the resources for which are included above.

Beyond the provision of additional teachers to provide English as a second language instruction to students who need that help, research shows that ELL students need a solid and rigorous core curriculum as the basis from which to provide any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly, & Callahan, 2003). This research suggests that ELL students need:

- Effective teachers – a core goal of all the staffing in this chapter and of the research on the importance of talent discussed in Chapter 7
- Adequate instructional materials (Element D.23) and good school conditions
- Good assessments of ELL students so teachers know in detail their English language reading and other academic skills (Element D.23)
- Less segregation of ELL students
- Rigorous and effective curriculum and courses for all ELL students, and affirmative counseling of such students to take those courses
- Professional development for all teachers, focusing on sheltered English teaching skills, (Element D.21)

Hakuta (2011) supports these conclusions but also notes that English language learning takes time (one reason we include the above resources for every grade level) and that "academic language" is critical to learning the new Common Core Standards. The new standards require more explicit and coherent ELL instructional strategies and extra help services if these are to be effective at ensuring that ELL students learn the subject matter, English generally, and academic English specifically.

Additional staff are needed to provide English as a Second Language (ESL) instruction during the regular school day, such as having ELL students take ESL in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of ELL students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ELL program each 100 ELL students should trigger one additional FTE teaching position. This makes it possible to establish pullout classes for ELL students and give them an additional dose of English instruction. The goal of this programming is to reinforce ELL student learning of academic content and English so at some point the students can continue their schooling in English only.

Research shows that it is the Limited English proficient, or English language learners (ELL),

from lower income and generally less educated backgrounds who struggle most in school and need extra help to learn both academics and English. We address this need by providing ELL resources *in addition* to tutoring, extended day and summer school resources (Elements C.8-C.10), as well as the additional pupil support staff (Element D.16).

For example, a school with 100 students who qualify for free and reduced price lunch (or some alternative measure of low income students) and no ELL students would receive 1.0 tutor position. But if the 100 low-income children were all ELL students, the school would receive an additional 1.0 teacher position – in addition to the 1.0 tutor and any extended day, summer school and pupil support resources as outlined above.

Given these realities, it is more appropriate to view the EB approach to extra resources for ELL students as including both resources for students from lower income backgrounds and ESL specific resources (Jimenez-Castellanos & Topper, 2012).

C.12 Special Education

Current Maine Policy	Evidence-Based Model
Special education is funded through a pupil weight in the formula, set at 1.27 for the 2012-2013 fiscal year. The state uses a six-step model to estimate the number of students requiring special education. Once the number of special education students is determined, the number is multiplied by 1.27 to generate EPS special education funding. There are also adjustments for small schools as well as an additional adjustment for districts where more than 15% of the students are identified as requiring special education services. It should be noted that the weight of 1.27 has varied over time ranging from a low of 1.245 in 2008-09 to a high of 1.375 in 2005-06.	A census approach to funding special education services for disabled students in the high incidence/lower cost categories. • One (1.0) teacher and 0.5 aide positions for every 150 regular students. This results in three teachers and 1.5 aide positions for each of the 450-student prototypical elementary and middle school, and 4 teachers and 2.0 aide positions for the 600-student prototypical high school. The EB Model includes the state reimbursing districts for 100 percent of the costs for the severely disabled, minus Federal Title VIb funds for such students.

Analysis and Evidence

Providing appropriate education services for students with disabilities, while containing costs and avoiding over-identification of students, particularly minority students, presents several challenges (see Levenson, 2012). Many mild and moderate disabilities, particularly those associated with students learning to read, are correctable through strategic early intervention, including the kinds of effective core instruction and targeted intervention programs, particularly one-to-one tutoring, discussed above (Element C.8).

For example, several studies (e.g., Landry, 1999) have documented that through a series of intensive instructional interventions nearly 75 percent of struggling readers identified in kindergarten and first grade can be brought up to grade level without the need for placement in special education. Other studies have noted decreases in disability labeling of up to 50 percent (see for example, Levenson, 2011; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996) with interventions of this type.

In many instances this approach requires school-level staff to change their practice and cease functioning in "silos" that serve children in "pull-out" programs identified by funding source for the staff member providing the services (e.g. General Fund, Special Education, Title I). Instead, all staff would team closely with the regular classroom teacher to identify deficits and work together to correct them as quickly as possible. This is a common sense approach that could be second nature in schools, but in many cases schools have heretofore been rooted in a "categorical culture" that must be corrected through professional development and strong leadership from the district office and the site principal.

Allocating a fixed census level of staffing (3.0 FTE teachers and 1.5 FTE aides) for an elementary school of 450 students) can meet the needs of children with mild and moderate disabilities if a functional, collaborative early intervention model such as the one outlined above can be implemented. We note that our staffing for the preceding programs for at-risk students meets this requirement – tutoring, extended day, summer school and ELL.

For children with more severe disabilities, clustering them in specific schools to achieve economies of scale is generally the most effective strategy and provides the greatest opportunity to find ways to mainstream them (to the extent feasible) with regular education students. In very sparsely populated areas this is often not feasible but should be explored. Students in these categories generally include: severely emotionally disturbed (ED); severely mentally and/or physically handicapped; and children within the spectrum of autism. The ED and autism populations have been increasing dramatically across the country, and it is likely that this trend will continue in the future. To make the provision of services to these children cost-effective it makes sense to explore clustering of services where possible and design cost parameters for clustered services in each category. In cases where students need to be served individually or in groups of two or three because of geographic isolation it would be helpful to cost out service models for those configurations as well but provide full state funding for those children. This would reduce the likelihood of overwhelming the financial capacity of a small school district that happens to be the home of a child with a severe disability.

To implement these approaches to services for students with disabilities, states have begun to fund special education services using the "census" approach. The census approach, which can be simply funded by providing additional teacher resources for prototypical schools, assumes the incidence of these categories of disabilities is approximately equal across districts and schools and includes resources for providing needed services at an equal rate for all schools and districts. The census approach has emerged across the country for several reasons:

- The continued rise in the number and percentage of "learning disabled" and continued questioning by some of the validity of these numbers
- Under-funding of the costs of severely disabled students

- Over labeling of poor, minority, and ELL students into special education categories, which often leads to lower curriculum expectations, and inappropriate instructional services
- Reduction of paper work

Often, the census approach for the high incidence, lower cost students with disabilities is combined with a different strategy for the low-incidence, high-need students, whose costs are funded separately and totally by the state, as these students are not found proportionately in all districts. For example, California approved a census-funding system, in part because many felt the old system created too many fiscal incentives to identify students as needing special education, and in part to improve the equity of the distribution of state aid for special education. Other reasons included the desire to give the local districts more flexibility while holding them accountable, and having a system that was easy to understand.

Today, diverse states such as Alabama, Arkansas, California, Montana, North Dakota, Pennsylvania, and the New England states of Massachusetts and Vermont all use census-based special-education funding systems. Moreover, all current and future increases in federal funding for disabled students are to be distributed on a census basis.

C.13 Gifted and Talented Students[16]

Current Maine Policy	Evidence-Based Model
Gifted and Talented (GT) education is funded state wide at approximately $10 million for the 2012-13 fiscal year. SAUs receive funding based on submitted budget expenses for GT. Funding provided to each SAU is based on expenditures from two years prior, inflated to an estimate of current year values. These resources go into the EPS funding formula.	Resources for gifted and talented students are provided at a rate of $25 per regular pupil. For example, these resources are sufficient to purchase programs such as Renzulli Learning.

Analysis and Evidence

A complete analysis of educational adequacy should include the gifted, talented, and able and ambitious students, most of who perform above state proficiency standards. This is important for all states whose citizens desire improved performance for students at all levels of achievement. Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low income and/or culturally diverse students
- Curriculum materials designed specifically to meet the needs of talented learners
- Acceleration of the curriculum
- Special training in how teachers can work effectively with talented learners.

Discovering hidden talents in low-income and/or culturally diverse high ability learners. Research studies on the use of performance assessments, nonverbal measures, open-ended tasks,

[16] This section is based on an unpublished literature review written by Dr. Ann Robinson, Professor, University of Arkansas at Little Rock and included in abbreviated form in Odden & Picus, 2014.

extended try-out and transitional periods, and inclusive definitions and policies produce increased and more equitable identification practices for high ability culturally diverse and/or low-income learners. Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, high ability culturally diverse learners who participated in three or more years of specialized elementary and/or middle school programming had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high ability students who did not participate (Struck, 2003).

Access to curriculum. Overall, research shows that curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increases in the complexity of the curricular material is a key factor (Robinson & Clinkenbeard, 1998). Large-scale curriculum projects in science and mathematics in the 1960s, such as the Biological Sciences Curriculum Study (BCSC), the Physical Science Study Committee (PSSC), and the Chemical Bond Approach (CBA), benefited academically talented learners (Gallagher, 2002). Further, curriculum projects in the 1990s designed to increase the achievement of talented learners in core content areas such as language arts, science, and social studies produced academic gains in persuasive writing and literary analysis (VanTassel-Baska, Johnson, Hughes & Boyce, 1996; VanTassell-Baska, Zuo, Avery & Little, 2002), scientific understanding of variables (VanTassel-Baska, Bass, Ries, Poland & Avery, 1998), and problem generation and social studies content acquisition (Gallagher & Stepien, 1996; Gallagher, Stepien & Rosenthal, 1992).

Access to acceleration. Because academically talented students learn quickly, one effective option for serving them is acceleration of the curriculum. Many educators and members of the general public believe acceleration always means skipping a grade. However, there are at least 17 different types of acceleration ranging from curriculum compacting (which reduces the amount of time students spend on material) to subject matter acceleration (going to a higher grade level for one class) to high school course options like Advanced Placement or concurrent credit (Southern, Jones & Stanley, 1993). In some cases, acceleration means *content* acceleration, which brings more complex material to the student at his or her current grade level. In other cases, acceleration means *student* acceleration, which brings the student to the material by shifting placement. Reviews of the research on different forms of acceleration have been conducted across several decades and consistently report the positive effects of acceleration on student achievement (Kulik & Kulik, 1984; Southern, Jones & Stanley, 1993), including Advanced Placement classes (Bleske-Rechek, Lubinski & Benbow, 2004). Multiple studies also report participant satisfaction with acceleration and benign effects on social and psychological development.

Access to trained teachers. Research and teacher reports indicate that general classroom teachers make very few, if any, modifications for academically talented learners (Archambault, et al, 1993), even though talented students have mastered 40 to 50 percent of the elementary curriculum before the school year begins. In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners. Students report differences among teachers who have had such training, and independent observers in the classroom document the benefit of this training as well (Hansen & Feldhusen,

1994). Curriculum and instructional adaptation requires the support of a specially trained coach at the building level, which could be embedded in the instructional facilitators recommended above (Reis & Purcell, 1993). Overall, learning outcomes for high ability learners are increased when they have access to programs whose staff have specialized training in working with high ability learners, which could be accomplished with the professional development resources recommended below.

Overall, research on gifted programs indicates that the effects on student achievement vary by the strategy of the intervention. Enriched classes for gifted and talented produce effect sizes of about +0.40 and accelerated classes for gifted and talented studnets produce somewhat larger effectives sizes of +0.90 (Gallagher, 1996; Kulik & Kulik, 1984; Kulik & Kulik, 1992).

Practice implications. At the elementary and middle school level, our understanding of the research on best practices is to place gifted students in special classes comprised of all gifted students and accelerate their instruction because such students can learn much more in a given time period than other students. When the pull out and acceleration approach is not possible, an alternative is to have these students skip grades in order to be exposed to accelerated instruction. Research shows that neither of these practices produces social adjustment problems. Many gifted students get bored and sometimes restless in classrooms that do not have accelerated instruction. Both of these strategies have little or no cost, except for scheduling and training of teachers (which is covered in the professional development staffing).

The primary approach to serve gifted students in high schools is to enroll them in advanced courses – advanced placement (AP), International Baccalaureate (IB) – to participate in dual enrollment in postsecondary institutions, or to have them take courses through distance learning mechanisms.

We confirmed our understanding of best practices for the gifted and talented with the directors of three of the Gifted and Talented research centers in the United States: Dr. Elissa Brown, Director of the Center for Gifted Education, College of William & Mary; Dr. Joseph Renzulli, The National Research Center on the Gifted and Talented at the University of Connecticut; and Dr. Ann Robinson, Director of the Center for Gifted Education at the University of Arkansas at Little Rock.

The University of Connecticut center also agreed with these conclusions and has developed a very powerful Internet-based platform, Renzulli Learning, which could provide for a wide range of programs and services for gifted and talented students. This system takes students through about a 25-30 minute detailed assessment of their interests and abilities, which produces an individual profile for the student. The student is then directed, via a search engine, to 14 different Internet data systems, including interactive web-sites and simulations that provide a wide range of opportunities to engage the student's interests. Renzulli stated that such an approach was undoubtedly the future for the very bright student and could be supported by a grant of $25 per student in a district. Field (2007) found that after 16 weeks, students given access to an internet based program, such as Renzulli Learning to read, research, investigate, and produce materials, significantly improved their overall achievement in reading comprehension, reading fluency and social studies.

C.14 Career and Technical Education

Current Maine Policy	Evidence-Based Model
Funding for Career and Technical Education is based on an expenditure reimbursement model that reimburses SAUs for approved expenditures.	The EB model includes $9,000 per CTE teacher for state of the art computer and other equipment.

Analysis and Evidence

Vocational education, or its modern term, Career and Technical Education (CTE), has been experiencing a shift in focus for the past several years. Traditional vocational education focused on practical, applied skills needed for wood and metal-working, automobile mechanics, typing and other office assistance careers, including home economics. Today, many argue that vo-tech is info-tech, nano-tech, bio-tech, and health-tech. The argument is that Career and Technical education should begin to incorporate courses that provide students with applied skills for new work positions in the growing and higher wage economy including information technologies (such as computer network management), engineering (such as computer-assisted design), a wide range of jobs in the expanding health portions of the economy and bio-technical positions – all of which can be entered directly from high school. The American College Testing Company and many policymakers have concluded that the knowledge, skills and competencies needed for college are quite similar to those needed for work in the higher-wage, growing jobs of the evolving economy.

One key issue is the cost of these programs. Many districts and states believe that these new career-technical programs cost more than the regular program and even more than traditional vocational classes. However, in a review conducted for a Wisconsin school finance adequacy task force, a national expert (Phelps, 2006) concluded that the best of the new career-technical programs did not cost more, especially if the district and state made adequate provisions for professional development (as teachers in these new programs needed training) and computer technologies (as computer technologies were heavily used). These conclusions generally were confirmed by a cost analysis (Odden & Picus, 2010) of Project Lead the Way (PLTW), one of the most highly rated and "expensive" career technical programs in the country.

PLTW (**www.pltw.org**) is a nationally recognized exemplar for secondary CTE education. Often implemented jointly with local postsecondary education institutions and employer advisory groups, these programs usually feature project- or problem-based learning experiences, career planning and guidance services, and technical and/or academic skills assessments. Through hands-on learning, the program is designed to develop the science, technology, engineering and mathematics skills essential for achievement in the classroom and success in college or jobs not requiring a four-year college education. As of 2010, PLTW was offered in more than 3,000 high schools in all 50 states and enrolled over 350,000 students.

The curriculum features rigorous, in-depth learning experiences delivered by certified teachers and end-of-course assessments. High-scoring students earn college credit recognized in more than 100 affiliated postsecondary institutions. Courses focus on engineering foundations

(design, principles, and digital electronics) and specializations (e.g., architectural and civil engineering, bio-technical engineering) that provide students with career and college readiness competencies in engineering and science. Students need to take math through Algebra 2 in order to handle the courses in the program, which also meets many states' requirements for science and other mathematics classes.

The major cost areas for the program are in class size, professional development and computer technologies. Most programs recommend class sizes of 25, consistent with the national median and the EB model. Professional development and most of the computer technologies would be covered by the professional development and computer resources provided by the EB model. Some of the PLTW concentration areas require a one-time purchase of expensive equipment, which can be covered by the $9,000 per career-technical education teacher in the EB model.

D. ADDITIONAL STAFFING AND RESOURCE NEEDS

This section completes the identification of resources for the prototypical schools and includes discussions of substitute teachers, pupil support personnel, librarians, aides, school administration, professional development, and allocations of dollars per pupil to fund other items.

D.15 Substitute Teachers

Current Maine Policy	Evidence-Based Model
The Maine EPS formula includes $37 per attending pupil for substitute teachers.	The EB model includes resources for substitute teachers at the ratio of 5 percent of all teacher positions (which provides about 10 days per teacher on a 200 day teacher year).
Analysis and Evidence	
Traditionally, specific provisions for substitute teachers have not been included in any state's school finance formula. States with new, adequacy-based systems, however, such as Maine, have begun to explicitly include these resources. Schools need some level of substitute teacher allocations in order to cover classrooms when teachers are sick for one or two days, absent for other reasons, on long term sick or pregnancy leave, etc. A good approximation of the substitute resources needed is to add an additional five percent of teachers to the sum of all teacher positions identified above, a standard we have used successfully in other states and consistent with typical practice.	

D.16 Student Support/Family Outreach

Current Maine Policy	Evidence-Based Model
The Maine EPS formula provides: • One (1) guidance counselor for every 350 K-8 students • One (1) guidance counselor for every	Staffing ratios are: • One (1) guidance counselor for every 450 elementary school students • One (1) guidance counselor for every

250 Grade 9-12 students • One (1) health professional for every 800 students across all grade levels. These figures are increased by 10% for SAUs with fewer than 1,200 attending students. (See Table 2.1 for details)	250 Grade 9-12 students. • One (1) nurse for every 750 students • One (1) professional pupil support position for every 100 students eligible for free and reduced price lunch These staffing provisions enable districts and schools to allocate FTE staff to serve as guidance counselors, nurses, psychologists, and social workers, in a way that best addresses student needs from the perspective of each district and school.

Analysis and Evidence

Schools need a student support and family outreach strategy. Various comprehensive school designs have suggested different ways to provide such a program strategy (Stringfield, Ross & Smith, 1996; for further discussion, see Brabeck, Walsh & Latta, 2003). In terms of level of resources, the more disadvantaged the student body, the more comprehensive the strategy needs to be. The general standard is one licensed professional for every 100 students from a low-income background, with a minimum of one for each prototypical school.

Although there are many ways schools can provide outreach to parents, or involve parents in school activities – from fund raisers to governance – research shows that school sponsored activities that impact achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, helping parents and students to understand both what needs to be learned and what constitutes acceptable standards for academic performance is helpful. Put succinctly, parent outreach that explicitly and directly addresses what parents can do to help their children learn, and to understand the standards of performance that the school expects, are the types of school-sponsored parent activities that produce discernible impacts on student's academic learning (Steinberg, 1997).

At the secondary level, the goal of such activities is to have parents learn about what they should expect of their children in terms of their learning and academic performance in high school. If a district or a state requires a minimum number of courses for graduation, that requirement should be made clear. If there are similar or more extensive course requirements for admission into state colleges and universities, those requirements should be addressed. If either average scores on end-of-course examinations or a cut-score on a comprehensive high school test are required for graduation, they too should be discussed. Secondary schools need to help many parents understand how to more effectively assist their children to find an academic pathway through middle and high school, understand standards for acceptable performance, and at the high school, be aware of the course work necessary for college entrance.

At the elementary school level, the focus for parent outreach and involvement programs should concentrate on what parents can do at home to help their children learn academic work for school. Too often parent programs focus on fund raising through the parent-teacher

organization, involvement in decision making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities might impact other goals – such as making parents feel more comfortable being at school or involving parents more in some school policies – they have little effect on student academic achievement. Parent actions that impact learning would include: 1) reading to them at young ages, 2) discussing stories and their meanings, 3) engaging in open ended conversations, 4) setting aside a place where homework can be done, and 5) ensuring that their child completes homework assignments.

The EB model uses the standards from the American School Counselor Association (ASCA), which is one counselor for every 250 secondary students. This produces 1.8 guidance counselor positions in the prototypical middle school and 2.4 guidance counselors in the prototypical high schools. Because most states also require a guidance counselor in elementary schools at about the size of our 450 student prototypical elementary school, the EB model also includes one guidance counselor at the level.

The EB model provides school nurses at the rate of 1 FTE nurse position for every 750 students, the staffing standard of the American School Nurse Association.

The EB model provides additional pupil support personnel to schools on the basis of free and reduced price lunch counts, an indicator of more non-academic support help. The EB model provides one professional pupil support position for every 100 students eligible for free and reduced price lunch, in addition to the above counselor and nurse staff.

These staffing provisions enable districts and schools to allocate FTE staff to serve as guidance counselors, nurses, psychologists, and social workers, in a way that best addresses student needs from the perspective of each district and school.

D.17 Aides/Education Technicians

Current Maine Policy	Evidence-Based Model
The Maine EPS formula provides: • One (1) educational technician or aide for every 100 K-8 students • One (1) educational technician or aide for every 250 Grade 9-12, students This figure is increased by 10% for SAUs with less than 1,200 attending students (see Table 2.1 above for details).	Staffing ratios are: • One (1) FTE supervisory aide position for every 225 elementary and middle school students • One (1) FTE supervisory aide position for every 100 high school students The EB model also includes 1 instructional aide position for every 15 Pre-K students.

Analysis and Evidence
Elementary, middle and high schools need staff for responsibilities that include lunch duty, before and after school playground supervision, bus duty, and others. Covering these duties generally requires an allocation of supervisory aides at about the rate of 2.0 FTE aide positions for a school of 400-500 students. However, research does not support the use of instructional aides for improving student performance. As noted above (Element B.5), the Tennessee STAR study, which produced solid evidence through field-based randomized trails that small classes work in elementary schools, also produced evidence that instructional aides in schools do not add value, *i.e.*, do not positively impact student academic achievement (Gerber, Finn, Achilles & Boyd-Zaharias, 2001). At the same time, districts may want to consider a possible use of instructional aides that is supported by research. There are two studies that show how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student reading attainment. Some districts have used Farkas-type tutors for students still struggling in reading in the upper elementary grades. Another study by Miller (2003) showed that such aides could also have an impact on reading achievement if used to provide individual tutoring to struggling students in the first grade. We should note that neither of these studies supports the typical use of instructional aides as teacher helpers. Evidence shows that instructional aides can have an impact but only if they are selected according to educational criteria, trained in a specific tutoring program, deployed to provide tutoring to struggling students, and closely supervised. The EB Model provides two (2) FTE supervisory aide positions for the prototypical elementary and middle school and three (3) FTE supervisory aide positions for the prototypical high school, to be used for relieving teachers from lunchroom, playground and other non-teaching responsibilities.

D.18 Librarians

Current Maine Policy	Evidence-Based Model
Maine's EPS system provides • One (1) librarian position for every 800 K-12 students • One (1) library technician/aide for every 500 K-12 students This figure is increased by 10% for SAUs with less than 1,200 attending students (see Table 2.1 above for details).	Staffing ratios are: • One (1) librarian for every 450 student elementary and middle school • One (1) librarian for every 600 student high school

Analysis and Evidence
Most schools have or should have a library, and the staff resources must be sufficient to operate the library and to incorporate appropriate technologies into the library system. Further, some elementary librarians could teach students for some of the day as part of special subject offerings. The EB Model recommendation for library staff is derived from best practices, practice in other states, as well as state statutes where they exist.

D.19 Principal

Current Maine Policy	Evidence-Based Model
Maine's EPS system provides: • One (1) administrative position for every 305 K-8 students • One (1) administrative position for every 315 Grade 9-12 students This figure is increased by 10% for SAUs with less than 1,200 attending students (see Table 2.1 above for details).	Staffing ratios are: • One (1) principal for every 450 student elementary and middle school • One (1) principal for every 600 student high school • One (1) assistant principal for every 600 student high school
Analysis and Evidence	
Every school unit needs a principal. There is no research evidence on the performance of schools with or without a principal. The fact is that essentially all schools in America, if not the world, have a principal. All comprehensive school designs, and all prototypical school designs from all professional judgment studies around the country, include a principal for every school unit. However, few if any comprehensive school designs include assistant principal positions. And very few school systems around the country provide assistant principals to schools with 500 students or less. Since we also recommend that instead of one school with a large number of students, school buildings with large numbers of students be sub-divided into multiple school units within the building, we recommend that each unit have a principal. This implies that one principal would be required for each school unit.	

D.20 School Site Secretarial Staff

Current Maine Policy	Evidence-Based Model
Maine's EPS system provides: • One (1) school based clerical support position for every 200 elementary, middle and high students This figure is increased by 10% for SAUs with less than 1,200 attending students (see Table 2.1 above for details).	Staffing ratios are: • Two (2) FTE school clerical positions for every 450 student elementary and middle school • Three (3) FTE school clerical positions for every 600 student high school

Analysis and Evidence
Every school site needs secretarial support to provide clerical and administrative assistance support to administrators and teachers, to answer the telephone, greet parents when they visit the school, help with paper work, and other tasks essential to the operation of a school site. The EB Model provides resources for two (2) clerical positions for each prototypical elementary and middle school and three (3) clerical support positions for every prototypical high school.

D.21 Professional Development

Current Maine Policy	Evidence-Based Model
Maine's EPS program provides $59 per attending pupil for professional development.	The EB model includes the following: • 10 days of pupil free time for training • Funds for training at the rate of $100 per pupil These resources are in addition to: • Instructional Coaches (Element B.7) • Collaborative work with teachers in their schools during planning and collaborative time periods (Element B.7)

Analysis and Evidence
All school faculties need ongoing professional development., Improving teacher effectiveness through high quality professional development is arguably as important as all of the other resource strategies identified. Effective teachers are the most influential factor in student learning (Rowan, Correnti & Miller, 2002; Wright, Horn & Sanders, 1997) and more systemic deployment of effective instruction is key to improving learning and reducing achievement gaps (Odden, 2011a; Raudenbusch, 2009). An ongoing, comprehensive and systemic professional development program is the way in which all the resources recommended in this report are transformed into high quality instruction that increases student learning. Further, though the key focus of professional development is for better instruction in the core subjects of mathematics, reading/language arts, history and science, the professional development resources by the EB model are adequate to address the instructional needs for gifted and talented and English language learning students, for embedding technology in the curriculum, and for elective teachers as well. Finally, all beginning teachers need intensive professional development, first in classroom management, organization and student discipline, and then in instruction. Fortunately, there is recent and substantial research on effective professional development and its costs (e.g., Crow, 2011; Odden, 2011b). Effective professional development is defined as professional development that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles researchers and professional development organizations use to characterize "high quality" or

"effective" professional development draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. Combined, these studies and recent reports from Learning Forward, the national organization focused on professional development (see Crow, 2011), identified six structural features of effective professional development:

- The *form* of the activity – that is, whether the activity is organized as a study group, teacher network, mentoring collaborative, committee or curriculum development group. The above research suggests that effective professional development should be school-based, job-embedded and focused on the curriculum taught rather than a one-day workshop.
- The *duration* of the activity, including the total number of contact hours that participants are expected to spend in the activity, as well as the span of time over which the activity takes place. The above research has shown the importance of continuous, ongoing, long-term professional development that totals a substantial number of hours each year, at least 100 hours and closer to 200 hours.
- The degree to which the activity emphasizes the *collective participation* of teachers from the same school, department, or grade level. The above research suggests that effective professional development should be organized around groups of teachers from a school that over time includes the entire faculty
- The degree to which the activity has a *content focus* – that is, the degree to which the activity is focused on improving and deepening teachers' content knowledge as well as how students learn that content. The above research concludes that teachers need to know well the content they teach, need to know common student miscues or problems students typically have learning that content, and effective instructional strategies linking the two.
- The extent to which the activity offers opportunities for *active learning*, such as opportunities for teachers to become engaged in the meaningful analysis of teaching and learning; for example, by scoring student work or developing, refining and implementing a standards-based curriculum unit. The above research has shown that professional development is most effective when it includes opportunities for teachers to work directly on incorporating the new techniques into their instructional practice (see also Joyce & Showers, 2002).
- The degree to which the activity promotes *coherence* in teachers' professional development, by aligning professional development to other key parts of the education system such as student content and performance standards, teacher evaluation, school and district goals, and the development of a professional community. The above research supports tying professional development to a comprehensive, inter-related change process focused on improving student learning.

Form, duration, and active learning together imply that effective professional development includes some initial learning (*e.g*. a two-week – 10 day – summer training institute) as well as considerable longer-term work in which teachers incorporate the new methodologies into their actual classroom practice. Active learning implies some degree of collaborative work and coaching during regular school hours to help the teacher incorporate new strategies in his/her normal instructional practices. It should be clear that the longer the duration, and the more the coaching, the more time is required of teachers as well as professional development trainers and coaches.

Content focus means that effective professional development focuses largely on subject matter knowledge, what is known about how students learn that subject, and the actual curriculum that is used in the school to teach this content. Collective participation implies that the best professional development includes groups of and at some point all teachers in a school, who then work together to implement the new strategies, engage in data-based decision making (Carlson, Borman & Robinson, 2011) and in the process, help build a professional school community.

Coherence suggests that the professional development is more effective when the signals from the policy environment (federal, state, district, and school) reinforce rather than contradict one another or send multiple, confusing messages. Coherence also implies that professional development opportunities should be given as part of implementation of new curriculum and instructional approaches. Note that there is little support in this research for the development of individually oriented professional development plans; the research implies a much more systemic approach.

Each of these six structural features has cost implications. Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year as well. This time costs money. Further, all professional development strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to comprehensively describe specific professional development programs and their related resource needs.

From this research on the features of effective professional development, the EB model includes the following for a systemic, ongoing, comprehensive professional development program:

- 10 days of pupil free time for training,
- Funds for training at the rate of $100 per pupil

These resources are in addition to:

- Instructional coaches (Element B.7)
- Collaborative work with teachers in their schools during planning and collaborative time periods (Element B.7)

D.22 Technology and Equipment

Current Maine Policy	Evidence-Based Model
The Maine EPS system provides: • $98 per K-8 attending student • $296 per grade 9-12 attending student	The EB model provides: • $250 per every PK-12 student
Analysis and Evidence	
Over time, schools need to embed technology in instructional programs and school management strategies. Today, more and more states are requiring students to not only be technologically proficient but also to take some courses online in order to graduate from high school. Further, there are many online education options, from state-run virtual schools such as those in Florida	

and Wisconsin, to those created by private sector companies who run many virtual charter schools, such as K12 Inc. and Connections Academy. "Blended instructional" models, such as Rocketship, have also emerged. These programs infuse technology and online teaching in regular schools, provide more 1-1 student assistance, and put the teacher into more of a coaching role (see Odden, 2012). Research also shows that these technology systems work very well for many students, and can work very effectively in schools with high concentrations of lower income and minority students. Moreover, they are often less costly than traditional public schools (Battaglino, Haldeman & Laurans, 2012; Odden, 2012).

Infusing technology into the school curriculum has associated costs for computer hardware, networking equipment, software, training and personnel associated with maintaining and repairing these machines.

- The *Total Cost* of purchasing and embedding technology into the operation of schools identifies both the direct and indirect costs of technology and its successful implementation.
    - The *direct costs* of technology include hardware, software, and labor costs for repairing and maintaining the machines.
    - *Indirect costs* include the costs of users supporting each other, time spent in training classes, casual learning, self-support, user application development and downtime costs.

This Element (D.22) identifies only direct technology costs, as the indirect costs, which are primarily training, are included in the overall professional development resources (Element D.21). Districts also need individuals to serve as technical support for technology embedded curriculum and management systems (Element E.25), though the bulk of that work can be covered by warranties purchased at the time computers are acquired.

In estimating the direct costs of purchasing, upgrading, and maintaining computer hardware, the software that helps these computers to function, and the networks on which they run, the EB approach recognizes the fact that today virtually no school is beginning at a baseline of zero. All schools have a variety of computers of varying ages, the large majority of which are connected to school networks and the Internet. Unlike the 1990's when expensive projects had to retrofit schools with data networks, the following cost estimates identifies resources needed to maintain and enhance the technology base that exists in schools. Moreover, as should be clear, these are ongoing and not one-off costs.

We also note that each district and school situation is unique, requiring that an individual technology plan be created at both district and school levels. Most districts and schools have technology plans because of the federal funding requirements in the E-Rate and EETT programs. These documents should be meaningful mechanisms used to allocate resources to the areas of most need within the school or district environment.

We refer readers to more detailed analysis of the costs of equipping schools with ongoing technology materials (Odden, 2012) that was spearheaded by Scott Price of the South Pasadena School District in California. That analysis estimated four categories of technology costs that totaled $250 a pupil. The amounts by category should be considered flexible as districts and

schools will need to allocate dollars to their highest priority technology needs outlined in state and district technology plans. The per pupil costs for each of the four subcategories are:

- Computer hardware: $71
- Operating systems, productivity and non-instructional software: $72
- Network equipment, printers and copiers: $55
- Instructional software and additional classroom hardware: $52

This per pupil figure would be sufficient to purchase, upgrade and maintain computers, servers, operating systems and productivity software, network equipment, and student administrative system and financial systems software, as well as other equipment such as copiers. Since the systems software packages vary dramatically in price, the figure would cover medium priced student administrative and financial systems software packages.

The $250 per pupil would allow a school to have one computer for every two to three students. This ratio would be sufficient to provide every teacher, the principal, and other key school-level staff with a computer, and to have an actual ratio of about one computer for every three-to-four students in each classroom. This level of funding would also allow for the technology needed for schools to access distance learning programs, and for students to access the new and evolving local online testing programs. Fortunately, most states have developed a substantial technology infrastructure over the years, so nearly all schools in America are linked to the Internet and to district offices and/or a state network. This allocation would be sufficient for small schools as well, particularly today when schools begin with some technology.

Further as noted, we recommend districts either incorporate maintenance costs in lease agreements or, if purchasing the equipment, buy 24-hour maintenance plans, to eliminate the need for school or district staff to fix computers. For example, for a very modest amount, one can purchase a maintenance agreement from a number of computer manufacturers that guarantees computer repair on a next business day basis. In terms of educator concerns that it would be difficult for a manufacturer's contractors to serve remote communities, the maintenance agreement makes meeting the service requirements the manufacturer's or contractor's problem and not the district's problem. Many of the private sector companies that offer such service often take a new computer with them, leave it, and take the broken computer to fix, which often turns out to be more cost effective than to send technicians all around to fix broken computers.

D.23 Instructional Materials

Current Maine Policy	Evidence-Based Model
The Maine EPS system provides: • $346 per attending K-8 student for instructional materials and supplies • $478 per attending 9-12 student for instructional materials and supplies • $42 per K-12 student for formative and other assessments	**Table 6.2: Instructional Materials in EB Model** The EB model also includes $10 per pupil for supplemental instructional and other materials for each of the above tutoring, extended day, summer school, ESL and pupil support programs (Elements C.8-C.12).

	Elementary School	Middle School	High School
Library Texts and Electronic Services	$20	$20	$25
Textbooks and Consumables	$120	$120	$150
Formative, short cycle assessments	$30	$30	$30
Total Instructional Materials	**$170**	**$170**	**$205**

Analysis and Evidence

The need for up-to-date instructional materials is paramount. Newer materials contain more accurate information and incorporate the most contemporary pedagogical approaches. To ensure that materials are current, twenty states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Ratvitch, 2004). Up-to-date instructional materials are expensive, but vital to the learning process. Researchers estimate that up to 90 percent of classroom activities are driven by textbooks and textbook content (Ravitch, 2004). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely.

The type and cost of textbooks and other instructional materials differ across elementary, middle school, and high school levels. Textbooks are more complex and thus more expensive at the upper grades and less expensive at the elementary level. Elementary grades, on the other hand, use more workbooks, worksheets and other consumables than the upper grades. Both elementary and upper grades require extensive pedagogical aides such as math manipulatives and science supplies that help teachers to demonstrate or present concepts using different pedagogical approaches. As school budgets for instructional supplies have tightened in the past, consumables and pedagogical aides have typically been the first items to be cut as teachers have been forced to make due or to purchase materials out of their own pockets.

The price of textbooks ranges widely. In reviewing the price of adopted materials from a variety of sources, the top end of the high school price ban is notable at $120 per book (see Table 6.3). Ten to fifteen years ago such prices for textbooks at the high school level were uncommon, but as more students move to take advanced placement courses, districts have been forced to purchase more college-level texts at college-level prices.

Table 6.3: Costs of Textbooks and Instructional Supplies by School Level (in annual dollars per pupil)

	Elementary School	Middle School	High School
Textbooks	$45 - $70 ($60)	$50 - $80 ($70)	$75 - $120 ($100)
Consumables and Pedagogical Aides	$60	$50	$50
Total	**$120**	**$120**	**$150**

The total figure would provides sufficient funds for adequate instructional materials and texts for most non-severe special education students. Modifications for severe special education cases would need to be funded from Special Education funds.

Adoption Cycle. Assuming a purchase of one textbook per student annually allows for a six-year adoption cycle. The six-year adoption cycle fits nicely with the typical secondary schedule of six courses in a six period day (see Table 6.4). It also comes close to matching the content areas covered at the elementary level.

Table 6.4: Potential Secondary Six Year Adoption Cycle

Year	2012	2013	2014	2015	2016	2017
Content Area	Science Health P.E.	Social Studies	Foreign Language	Fine Arts	English Language Arts	Mathematics

At the elementary level, there are fewer subject areas to be covered leaving the opportunity for a sixth year in the cycle to be used for purchasing not only additional supplementary texts but also consumables/pedagogical aides (see Table 6.5).

Table 6.5: Potential Elementary Six Year Adoption Cycle

Year	2012	2013	2014	2015	2016	2017
Content Area	Language Arts	Mathematics	Social Studies	Science/ Health	P.E., Visual and Performing Arts	Supplements, Consumables, Manipulatives

Short cycle, formative assessments. Data-based decision making has become an important element in school reform over the past decade. It began with the seminal work of Black and Wiliam (1998) on how ongoing data on student performance could be used by teachers to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour, et al., 2010; Steiny, 2009). The goal is to have teachers use data to inform their instructional practice, identify students who need interventions and improve student performance. As a result, data based decision making has become a central element of schools that are moving the student achievement needle (Odden, 2009, 2012).

Recent research on data-based decision making has documented significant, positive impacts on

student learning. For example, Marsh, McCombs and Martorell (2010) showed how data-driven decision making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a recent study of such efforts using the gold standard of research -- randomized trials – showed that engaging in data-based decision making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman & Robinson, 2011).

There is some confusion in terminology when referring to these new assessment data. Generally, these data are student performance data different from those provided by state accountability testing, such as NECAP in Maine. The most generic term is "interim data," meaning assessment data collected in the interim between the annual administrations of state tests, though some practitioners and writers refer to such data as "formative assessments." There are at least two kind of such "interim" assessment data. Benchmark assessments, such as those provided by the Northwest Evaluation System called MAP (www.nwea.org), which are given 2-3 times a year, often at the beginning, middle and end of the year. They are meant to provide "benchmark" information so teachers can see during the year how students are progressing in their learning. Sometimes these benchmark assessments are given just twice, once in the fall and again in late spring, and function just as a pre- and post-test for the school year, even though some practitioners erroneously refer to tests used this way as "formative assessments."

A second type of assessment data is collected at shorter time cycles within every quarter or nine weeks of instruction; often referred to as "short cycle" or "formative" assessments. These more "micro" student outcome data are meant to be used by teachers both to plan instructional strategies before a curriculum unit is taught and to track student performance for the two-to-three curriculum concepts that would normally be taught during a nine week or so instructional period.

Examples of "short cycle" assessments include STAR Enterprise from Renaissance Learning, which in an online, adaptive system that provides data in reading and mathematics for grades Prek-12. The basic package costs less than $10 a student per subject, takes students just about 10-15 minutes to take the test , and can be augmented with professional development activities and programs. Many Reading First schools as well as many schools we have studied (Odden & Archibald, 2009) use the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) formative assessments (http://dibels.uoregon.edu).

The Wireless Generation (www.wirelessgeneration.com) has created a formative assessment, quite similar to DIBELS, that can be used with a handheld, mobile, electronic device. The company also offers a web service that provides professional development for teachers on how to turn the results into specific instructional strategies, including video clips of how to teach certain reading skills. The cost is approximately $15 per student per year, plus approximtely $200 per teacher for the device, and somewhat more for training, though the company usually uses a trainer-of-trainers approach.

Sometimes "interim" assessment data are teacher created but it often is more efficient to start with commercially available packages, most of which are administered online and provide immediate results. Short cycle assessments provide the information a teacher needs to create a micro-map for how to teach specific curriculum units. Though analyses of the state tests provide

a good beginning for schools to redesign their overall educational program, and benchmark assessments give feedback on each quarter of instruction and are often used to determine which students need interventions or extra help. Teachers also need the additional short cycle assessment and other screening data to design the details of, and daily lesson plans for, each specific curriculum unit in order to become more effective in getting all students to learn the main objectives in each curriculum unit to the level of proficiency.

When teachers have the detailed data from these interim assessments, they are able to design instructional activities that are more precisely matched to the exact learning status of the students in their own classrooms and school. In this way, their instruction can be much more efficient because they know the goals and objectives they want students to learn, and they know exactly what their students do and do not know with respect to those goals and objectives. With these data they can design instructional activities specifically to help the students in their classrooms learn the goals and objectives for the particular curriculum unit.

The costs of these powerful assessments are modest; the EB model provides $25 per pupil, which is more than sufficient for a school to purchase access to the system, as well as some specific technological equipment and related professional development. The Renaissance Learning STAR assessments can function as both interim and benchmark assessments, include both math and reading Prek-12, and cost less than this figure.

Library Funds. The average national per pupil expenditure for library materials in the 1999-2000 school year was $15 (excluding library salaries). This average varied by region with the West spending $14 per pupil annually and the Eastern states spending $19, and the North Central Region spending $16, with about 40 percent of the total used to purchase books and the remainder was spent on other instructional materials and/or services such as subscriptions to electronic databases (Michie & Holton, 2005).

As the world shifts to more digital resources, libraries are purchasing or using electronic databases such as online catalogs, the Internet, reference and bibliography databases, general article and news databases, college and career databases, academic subject databases, and electronic full-text books. In 2002, 25 percent of school libraries across the nation had no subscriptions, 44 percent had 1-3 subscriptions to electronic databases, 14 percent had 4-7 subscriptions, and 17 percent had subscriptions to 7 or more. Usually larger high schools subscribed to the most services (Scott, 2004).

Electronic database services vary in price and scope and are usually charged to school districts on an annual per pupil basis. Depending on content of these databases, costs can range from $1-5 per database per year per pupil.

Inflating these numbers to adequately meet the needs of the school libraries, the EB model includes funding of $25 per pupil for elementary and middle schools and $30 per pupil for high schools to pay for library text and electronic services. These figures modestly exceed the national average, allowing librarians to strengthen print collections. At the same time, it allows schools to provide, and experiment with, the electronic database resources on which more and more students rely (Tenopir, 2003).

D.24 Student Activities

Current Maine Policy	Evidence-Based Model
The Maine EPS formula includes: • $34 for student activities for every K-8 attending student • $114 per pupil for student activities for every 9-12 attending student	The EB provides: • $250 per pupil for student activities at all grade levels.
Analysis and Evidence	
Elementary, middle and high schools typically provide an array of after-school programs, from clubs, bands, and other activities to sports. Teachers supervising or coaching in these activities usually receive small stipends for these extra duties. Further, research shows, particularly at the secondary level, that students engaged in these activities tend to perform better academically than students not so engaged (Feldman & Matjasko, 2005), though too much extra-curricular activity can be a detriment to academic learning (Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1997). In earlier adequacy work in a variety of states, the EB model included amounts in the range of $60/pupil for middle school students and $120/pupil for high school students. But subsequent research in additional states has found that these figures are far below what districts and schools actually spend. An amount of $250/pupil across all grade levels more accurately reflects an adequate level of student activities resources, though the figures could vary by school level and state.	

E. DISTRICT RESOURCES

In addition to school-based resources, education systems also need resources for district level expenditures including the district office and operations and maintenance. These are outlined below.

E.25 Central Office

Current Maine Policy	Evidence-Based Model
Maine's EPS system provides: • $220 per attending pupil across all school levels for central office services.	The EB Model computes a dollar per pupil figure for the Central office based on the number of FTE positions generated and the salary and benefit levels for those positions. **Table 6.6: Central Office Staffing**

Central Office Staffing	
Prototypical District of 3,900 students	
Office and Position	**FTE**
Superintendent's Office	
Superintendent	1
Secretary	1
Business Office	
Business Manager	1
Director of Human Resources	1
Accounting Clerk	1
Accounts Payable	1
Secretary	1
Curriculum and Support	
Assistant Superintendent for Instruction	1
Director of Pupil Services	1
Director of Special Education	1
Director, Assessment and Evaluation	1
Secretary	3
Technology	
Director of Technology	1
Computer Technician	1
Secretary	1
Operations and Maintenance	
Director of M & O	1
Secretary	1
Other Expenses	
Miscellaneous (purchased services, supplies, legal, audit, association fees, elections, technology, etc.)	
Communication	

Analysis and Evidence

We have identified resources for these positions in other reports (see for example, Picus & Odden, 2010) drawing on a variety of research studies and professional standards for best practices. Over the past several years, we have developed central office staffing recommendations in five states, Washington, Wisconsin, North Dakota, New Jersey and Texas. In all states, we began our analysis with the research of Elizabeth Swift, who used professional judgment panels to determine staffing for a prototypical district. That research addressed the

issue of the appropriate staffing for a district of 3,500 students. Swift's work formed the basis of each states' analysis, where in three states (Washington, Wisconsin and North Dakota) we also conducted professional judgment panels to review the basic recommendations that emerged from Swift's research to estimate central office staffing requirements.

Through that work we were able to estimate the central office resources required for a district of 3,500 students. The initial studies provided for about 8 professional staff (superintendent, assistant superintendent for curriculum, business manager, and directors of human resources, pupil services, special education, technology and special education) and nine clerical positions. Although the research basis for staffing school district central offices is relatively limited, analysis of the Education Research Service (2009) Staffing Ratio report shows that nationally school districts with between 2,500 and 9,999 students employ an average of one central office professional/administrative staff member for every 440.0 students (Education Research Services, 2009). This works out to almost exactly eight central office professionals (7.95) in a district of 3,500 students. Our research based staffing formula of 8 FTE professional staff matches the ERS estimate of 8 FTE central office staff for a school district of 3,500 students nationally.

Because the 3,500 student district size did not readily incorporate our prototypical schools, parameters for which are needed to estimate maintenance and operations costs, over the past two years we increased our prototypical district size to 3,900 students so it would include, as noted above, four 450 student elementary schools, two 450 student middle schools, and two 600 student high schools. This larger size also helps us add the testing and evaluation, and computer technician staff, which districts have been arguing are needed today, while staying generally within the ERS parameters. The EB model includes ten professional staff positions and nine clerical staff for the central office of a prototypical school district with 3,900 students.

In addition to staffing, central offices need a dollar per pupil figure for such costs as insurance, purchased services, materials and supplies, equipment, association fees, elections, district wide technology, communications, and other costs.

Table 6.6 summarizes these staffing proposals organized into departments into which a central office could be organized. Larger districts would be provided the resources for a larger central office by prorating up the per pupil cost of this 3,900 pupil central office, and also could have more differentiated staff with coordinators as well as a full-fledged legal counsel for large districts.

Appropriate central office staffing levels would need to be adjusted for smaller as well as perhaps for larger districts. From our work in other states, the per pupil figure works until districts have about 390 students, ten percent of the size of the 3,900 student prototypical district. We show how the central office staffing has been adjusted for smaller districts in the section below on small district adjustments (see Section G and Table 6.12). Above 3,900 students, these central office staffing figures can be prorated up. We believe the EB approach works relatively well for Maine, as discussed below in the section on small district adjustments.

E.26 Operations and Maintenance

Current Maine Policy	Evidence-Based Model
The Maine EPS formula provides: • $1,013 per K-8 attending pupil and • $1,204 per grade 9-12 attending pupil for operations and maintenance costs.	Using the formulas described below, EB computes a dollar per pupil figure for the Central office based on the number of FTE positions generated and the salary and benefit levels for those positions.

Analysis and Evidence

Drawing on professional standards in the field as well as research, we have conducted considerable analysis of the cost basis for maintenance and operations (e.g., Picus & Odden, 2010; Picus & Seder, 2010). The discussion below summarizes our research on operations and maintenance, identifying the costs for custodians (school level), maintenance staff (district level) and groundskeepers (school and district level), as well as the costs of materials and supplies to support these activities.

Custodians*:* Custodians are responsible for the daily cleaning of classrooms and hallways as well as for routine furniture set ups and takedowns. In addition, custodians often manage routine and simple repairs like minor faucet leaks, and are expected to clean cafeterias/multipurpose rooms, lockers and showers. Custodial workers' duties are time-sensitive, are structured and varied. Zureich (1998) estimates the time devoted to various custodial duties:

- Daily duties (sweep or vacuum classroom floors; empty trash cans and pencil sharpeners in each classroom; clean one sink with faucet; and, security of room), which take approximately 12 minutes per classroom.
- Weekly duties (dust reachable surfaces; dust chalk trays and clean doors; clean student desk tops; clean sink counters and spots on floors; and, dust chalk/white boards and trays), each of which adds 5 minutes a day per classroom.
- In addition to these services, non-cleaning services (approximately 145 minutes per day) provided by custodians include: opening school (checking for vandalism, safety and maintenance concerns), playground and field inspection, miscellaneous duties (teacher/site-manager requests, activity set-ups, repairing furniture and equipment, ordering and delivering supplies), and putting up the Flag and PE equipment.

A formula that takes into consideration these cleaning and non-cleaning duties has been developed and updated by Nelli (2006). The formula takes into account teachers, students, classrooms and Gross Square Feet (GSF) in the school. The formula is:

- 1 Custodian for every 13 teachers, plus
- 1 Custodian for every 325 students, plus
- 1 Custodian for every 13 classrooms, plus
- 1 Custodian for every 18,000 Gross Square Feet (GSF), and
- The total divided by 4.

The formula provides a numeric equivalent of the number of custodians needed at prototypical schools. The advantage of using all four factors in estimating the number of custodians needed

is it will accommodate growth or decline in enrollment and continue to provide the school with adequate coverage for custodial services over time.

To show how this formula translates into a per pupil cost for custodial services, we have used the 3,900 student prototypical school district. This district includes four 450-student prototypical elementary schools, two 450-student middle schools, and two 600-student high schools. Using the resource allocations identified above in Table 6.1, and assuming that teachers are the core, specialist, special education and coaches at each school, each of whom has a classroom,[17] we identify the resources each school would have and use those to estimate the number of custodians needed for each school and the district.

Table 6.7 summarizes the custodial computations for this prototypical school district. Column 2 displays the enrollment of each school. Column 3 indicates the number of classrooms that enrollment generates at the pupil teacher ratios described above. This figure includes classrooms for special education programs as well as the regular program. Column 4 provides the number of teachers at each school. The fifth column uses current Arkansas facility standards to estimate the gross square footage of the prototypical schools in our prototype district.[18] The number of custodians in each school is computed using the formulas above and displayed in Column 6. In addition, we recommend an additional half time custodian for the high school to accommodate the higher number of after school and evening activities that typically occur at high schools. For this prototypical school district, total custodians would amount to 23 including a half time custodian at the district office.

Table 6.7: Prototypical District Custodial Computations

School Type (1)	Enrollment (2)	Classrooms (3)	Teachers (4)	Gross Square Feet (5)	Custodians (6)
Elementary	450	34	34	62,950	2.53
Elementary	450	34	34	62,950	2.53
Elementary	450	34	34	62,950	2.53
Elementary	450	34	34	62,950	2.53
Middle	450	27	27	62,784	2.26
Middle	450	27	27	62,784	2.26
High School	600	39	38	106,887	3.93
High School	600	39	38	106,887	3.93
District Total *	3,900	268	266	591,142	22.48

*Includes half time custodian at the district office

Maintenance Workers: Maintenance workers function at the district level, rather than at individual schools. Core tasks provided by maintenance workers include preventative

[17] While it could be argued that coaches do not need classrooms, this will accommodate potential classroom space for tutors as well.

[18] Arkansas standards are used as an approximation of the square footage requirements for prototypical schools. Many states have school facility standards that are described and outlined in a variety of alternative methods. The Arkansas standards are in about the middle of state standards that are available (see Seder, 2012).

maintenance, routine maintenance and emergency response activities. Individual maintenance worker accomplishment associated with core tasks are: (a) HVAC systems, HVAC equipment, and kitchen equipment; (b) Electrical systems, electrical equipment; (c) Plumbing systems, plumbing equipment; and, (d) Structural work, carpentry and general maintenance/repairs of buildings and equipment (Zureich, 1998).

Zureich (1998) recommends a formula for maintenance worker FTEs incorporated into the funding model for instructional facilities as follows:

[(# of Buildings in District) x 1.1 + (GSF/60,000 SqFt) x
1.2 + (ADM/1,000) x 1.3
+ General Fund Revenue/5,000,000) x 1.2] / 4
= Total number of Maintenance Workers needed.

We use a figure of $10,000 per pupil in revenues to estimate the number of maintenance workers in the prototypical district. Applying this formula to the prototypical district described for custodians results in just over nine maintenance workers for our prototype district. This is shown in the Table 6.8.

Table 6.8: Maintenance Workers in Prototypical School District

Category	Number	Factor	Combined
Number of Buildings	9	1.1	9.9
Gross Square Footage	9.68	1.2	11.82
Enrollment /1,000	3.83	1.3	5.07
General Fund Revenue (10,000/student)	7.66	1.2	9.36
Total FTE Maintenance Workers			9.04

Maintenance and Custodial supplies are estimated at $0.70 per gross square foot. The school gross square feet are 591,142 plus an estimated 10 percent more for the central office, bringing total district gross square footage to 650,256 and the cost of materials and supplies to $447,414 or $116.88 per pupil.

Grounds Maintenance: The typical goals of a school grounds maintenance program are generally to provide safe, attractive, and economical grounds maintenance (Mutter & Randolph, 1987). This, too, is a district level function. A theoretic example of a work crew's responsibility at various school levels in acres and days per year is expressed in Table 6.9, which uses the prototypical school district as an example.

Table 6.9: Groundskeeper Example

Facility Type	Crew Members	Site Acres	Days	Factor
Elementary School	3 Groundskeepers	14.2	62 days = [31 acre site hours x 16 acres/8 hrs. per day]	1
Middle School	3 Groundskeepers	24.2	93 days = [31 acre site hours x 24 acres/8 hrs. per day]	1.5
High School	3 Groundskeepers	40.6	155 days =[31 acre site hours x 40 acres/8 hrs. per day]	2.5

These factors can be used for the prototypical school district to estimate the total number of Grounds staff needed grounds keeping as follows:

Table 6.10: Groundskeepers in Prototypical School District

School Type	Acres	Days	Factor	Total Days
Elementary	14.2	62	1	62
Elementary	14.2	62	1	62
Elementary	14.2	62	1	62
Elementary	14.2	62	1	62
Middle	24.2	93	1.5	139.5
Middle	24.2	93	1.5	139.5
High school	40.6	155	2.5	387.5
High school	40.6	155	2.5	387.5
Total Days Required				1,302.00
Number of FTE at 220 days per FTE				5.92
Additional Groundskeeper for Central Office				1

Table 6.11 summarizes the number of custodians, maintenance workers and groundskeepers for this prototypical district.

Table 6.11: Total Maintenance and Operations FTE in Prototypical School District

Category	FTE
Custodians	22.48
Maintenance	9.04
Groundskeepers	6.92
Total	38.44

To estimate the district's expenditures for maintenance and operations, the number of positions in each category would be multiplied by the average total compensation for each position and added to the $447,415 for materials and supplies. This figure is easily computed on a per-pupil basis by dividing by district enrollment.

It is necessary to add the per pupil costs of utilities and insurance to these totals. It is unlikely that a district has much control over these costs in the short run and thus each district can best

estimate future costs using their current expenditures for utilities and insurance as a base.

In the course of our research on maintenance and operations, we identified an alternative approach for estimating the costs of these services. APPA, a professional association dedicated to educational facilities management offers staffing ratios that can be used to estimate resource needs for schools districts. APPA has staffing standards for maintenance workers, custodians, and groundskeepers; the same staff categories for which funding was estimated above. These staff resources are allocated according to different service care and stewardship levels. After careful review of APPA's web site and publications (APPA, 1998, 2001, 2002), which are considered industry standards for educational facilities, we found the APPA staffing ratios offered a strong research basis for establishing an appropriate benchmark for estimating the cost basis for O&M.

APPA standards offer a range of services levels. We estimated the costs associated with the staffing levels generated through APPA and compared them to the resources we identified above, using the Wyoming School Funding Model as the basis of comparison. Our baseline estimates suggest that using the APPA standards would generate resources comparable to those M&O resources currently provided for in the EB Model through a combination of the staffing ratios, funding for supplies and materials, and the resources for purchased services.

F. REGIONAL COST ADJUSTMENT FACTOR

A few states, including Maine, include a factor in the state aid formula that seeks to adjust the dollars provided to each district for differences in educational costs caused by regional differences in the purchasing price of the education dollar.

Current Maine Policy	Evidence-Based Model
Maine currently uses a regional adjustment factor that was developed, using 2004-05 data, for 35 geographic regions in the state and compares the average teacher salary in the region to the state average. The index represents the differences in teacher salaries at the time that it was developed whether the differences were caused by different local choices on teacher salary levels, differences in the ability to raise educational revenues and pay teachers or differences in the purchasing power of the education dollar.	The EB approach suggests that Maine develop either an Hedonic wage index or a Comparable Wage Index, or use those indices that have been developed by the National Center for Education Statistics, instead of the current regional cost adjustment in the formula.
Analysis and Evidence	
An issue that gained prominence in school finance beginning in the 1970s and remains relevant today is the difference in prices that school districts face in purchasing educational resources.	

Districts not only purchase a different market basket of educational goods (just as individuals purchase a different market basket of goods), but they also pay different prices for the goods they purchase. District expenditures determine quantity issues (numbers of different types of educational goods purchased, such as teachers, books, buildings, etc.), the level of quality of those goods, and the cost of or price paid for each good. The variety, number, quality, and price of all educational goods purchased determines school district (and/or school) expenditures. While "expenditures" are often referred to as "costs" in school finance parlance, there is a difference between these two economic terms. "Expenditure" refers to the money spent on school resources; "cost" refers to the money spent on school resources to receive a certain level of output or to provide a certain quality of service. So comparing just expenditures would not indicate differences in costs; the comparison would have to be for expenditures for the quality of service – or teacher.

Prices that school districts (and/or schools) face in purchasing educational resources differ across school districts and many states, like Maine, have taken an interest in trying to adjust school aid allocations to compensate for geographic cost or price differences. For example, a teacher of a certain quality will probably cost more in an urban area, where general costs of living are higher, than in nonurban areas, where general costs of living are lower. But prices or cost variations that districts must pay for teachers of the same quality also differ among school districts because of variations in the nature of the work required, the quality of the working environment, and the characteristics of the local community. Teachers might accept marginally lower salaries if, for example, they teach four rather than five periods a day or have smaller classes, or if there are numerous opportunities for staff development, relative to other districts. Or teachers might want marginally higher salaries if there are few cultural opportunities in the surrounding community. The combination of differences in general cost of living, working conditions, and the amenities of the surrounding community produces differences in prices that districts must pay for teachers of a given quality.

Though several different approaches can be taken in constructing cost-of-education indices (Chambers, 1981), there is substantial correlation among price indices constructed with different methodologies (Chambers, 1981). Whatever methodology is used, price differences can vary substantially across districts. In earlier studies of California (Chambers,1980), Missouri (Chambers, Odden, and Vincent, 1976), New York (Wendling, 1981b), and Texas (Monk and Walker, 1991), within-state price variations ranged from 20 percent (10 percent above and below the average) in California to 40 percent (20 percent above and below the average) in Texas. And price ranges remain about the same according to more recent studies of Wyoming and Texas (e.g., Baker, 2005; Taylor, 2004). These are substantial differences. These results mean that high-cost districts in California must pay 20 percent more for the same educational goods as low-cost districts; thus, with equal per-pupil revenues, high-cost districts are able to purchase only 75 percent of what low-cost districts can purchase. The differences in Texas are even greater. Such price differences, caused by circumstances and conditions essentially outside the control of district decision makers, qualify as a target for adjustments in some state aid formulas.

In early 2001, Fowler and Monk (2001) created a primer on how to develop price indices in education, using largely the hedonic index approach. Shortly after this primer was developed, however, a new approach to developing geographic adjustments for teacher salaries entered into school finance scholarly and policy debates. Rather than using the hedonic approach, which had

been used for the preceding 30 years, the new method takes a "comparable wage" approach. Under this new approach, the adjustment for teachers is taken from salary variations in occupations other than teaching (for a recent study, see Taylor, 2010). Taylor and Fowler (2006) used all occupations requiring a bachelor's degree or greater while Imazeki (2006) used salaries only for occupations that were similar to teaching. Imazeki's analysis showed, moreover, that the indices produced for all occupations were different from those produced only for occupations similar to teachers.

States can take two different approaches in using a price or cost-of-education index. First, state aid can be multiplied by the price index, thus ensuring that equal amounts of state aid will purchase equal amounts of educational goods. But this approach leaves local revenues unadjusted by price indices. A better method is to multiply the major elements of a school aid formula by the price index to ensure that total education revenues can purchase the same level of resources. Thus, the price index is applied to the foundation expenditure level in a foundation program, the tax base guaranteed by the state in a GTB program, the state-determined spending level in a full-state-funding program, or total current operating expenditures for a percentage equalizing formula.

As such, including a price index in a school finance formula is relatively simple. And the NCES has recently produced comparative wage indices that can be used for all districts and all states, including Maine (Taylor and Fowler, 2006) with updated figures for 2010 (at nces.ed.gov/efin/) with documentation and a users' guide.

While the existence of the NCES price indices alleviates the need for analysis, price indices do alter the distribution of state aid. In general, education price indices are higher in urban and metropolitan areas than in rural areas. Thus, with a given amount of state aid, use of a price index shifts the shares of state aid at the margin from rural to urban school districts. This distributional characteristic injects an additional dimension to constructing a politically viable state aid mechanism. Nevertheless, prices vary across school districts and affect the real levels of education goods and services that can be purchased. Including an education price index in the school aid formula is a direct way to adjust for these circumstances that are outside the control of school district policymakers.

G. SUMMARY OF STAFFING AND OTHER RESOURCES FOR SMALL SCHOOLS AND DISTRICTS

Table 6.1 at the beginning of this chapter summarizes all of the EB formulas for prototypical elementary, middle and high schools and compares them to the elements of Maine's current EPS formula.

As we show next, we incorporate these prototypical school models into a prototypical school district with 3,900 pupils with about 300 students a grade in four 450 student elementary schools, two 450 student middle schools and two 600 student high schools. To create a per pupil figure that could be used in a foundation program, for example, one needs to put prices on all the

ingredients in Table 6.1 and add to the total a cost per pupil for the central office and for maintenance and operations.

The combined figures would then provide a cost per pupil for a prototypical school district of 3,900 students that could be used as a basis for many school finance formulas. But because many districts in Maine have a student population of less than 3,900 students, one question is whether the above formulas and staffing allocations "work" for districts with fewer than 3,900 students. We have run these numbers and find that the answer is yes for a district down to about 975 students, which is one-fourth the size of the 3,900-student prototypical district. A district with 975 students would have 75 students per grade and could have one 450 student elementary school with typical staffing, one 225 student middle school and one 300 student high school, each with typical, but prorated, staffing. Below 975 students we conclude that additional staff support is required for an adequate program.

Table 6.12 displays the current EB approach for PK-12 school district administrative units with 390 and fewer pupils. The "Element" column shows the various staffing categories. Column 2 shows what the regular formulas above would provide to the school, and columns 3, 4 and 5 show the staffing for school districts of smaller sizes. We have increased core and specialist teachers from the 23.2 positions the regular formula generates to an even 24 for a school district with 390 students, and 13 for a district with 195 students. For a district with 97.5 students or fewer, which is half of 195, we recommend staffing for one administrator position at the rate of an assistant principal and 1 FTE teacher position for every 7 students, which provides staffing the very small school can deploy in any way it wishes. We have used this approach in a number of states and it provides very small school districts with adequate staffing levels along with the flexibility to allocate the staff in a way that works best for the individual district. This formula produces the 13.93 positions shown in column 5.

In reviewing the numbers in Table 6.12 for the 390 student district, we generally have rounded up partial FTEs for the "regular" formula district (column 2) to a whole number for several positions (column 3) including instructional coaches, librarian, guidance counselor/nurse, secretaries and supervisory aides, and then taken half that number for the 195 student district. All small districts receive the same dollar per pupil numbers for professional development trainers, technology/equipment, instructional materials, assessments, student activities and gifted and talented programming.

Table 6.12: EB Staffing for Schools in SAUs with 390 or Fewer Pupils

	Element		School Configuration			
			(2) 390 Pupils Regular Formula	(3) K12 School: 390 Pupils	(4) K12 School: 195 Pupils	(5) K12 School: 97.5 Pupils
Adequate Staffing for the Core Programs	B.5	Class size for core teachers	23.2	24	13	13.93
	B.6	Elective teachers				
	B.7	Instructional Coaches	1.95	2	1	--
Staffing for Extra Student Needs	C.13	Gifted and Talented	$25 / pupil	$25 / pupil	$25 / pupil	$25 / pupil
Additional Staffing and Resource Needs	D.16	Counselors	1.76	2	1	--
		Nurses				
		Supervisory Aides	1.8	2	1	--
	D.18	Librarians	0.8	1	0.5	--
	D.19	Principal	0.8	1	1	--
		Assistant Principal	0.2	1	0	1
	D.20	School Clerical	1.8	2	1	--
	D.21	Professional Development	$100 / pupil	$100 / pupil	$100 / pupil	$100 / pupil
	D.22	Computer Technologies	$250 / pupil	$250 / pupil	$250 / pupil	$250 / pupil
	D.23	Instructional Materials & Assessments	$181 / pupil	$181 / pupil	$181 / pupil	$181 / pupil
	D.24	Student Activities	$250 / pupil	$250 / pupil	$250 / pupil	$250 / pupil

SUMMARY: COMPARING THE EPS TO THE EB MODEL

The EB model uses a similar structure and approach to that used by the EPS in Maine. The EB model provides resources to meet all seven *Learning Results* categories in Maine and provides additional resources that in our view would establish a comprehensive education system as called for in the Resolve. Resources that are included in the EB, but are not specifically included in the EPS include career and technical education, gifted and talented education and co curricular activities.

The comparisons provided above show a number of differences in the specific staffing ratios for different grade levels as well as educational programs and support services, as well as differences in per pupil funding levels for certain resources. It appears that in some instances the cost of EPS exceeds the EB and in others the reverse is true – EB costs exceed those of the EPS. Once we have completed our EB model for Maine, we will be able to quantify those differences by specific program area. Examples of areas where EB funding exceeds EPS include an ongoing, systemic and comprehensives professional development program and more extra help resources for at-risk students.

It is our view that the EB model provides sufficient resources for all schools to offer a full liberal arts curriculum that offers an education program designed to meet college and career standards for all students. The EB approach is also sufficient to allow schools in Maine – if they use the resources in the most effective manner and organize teachers into collaborative groups – to dramatically increase student achievement on standardized performance tests such as the NECAP.

We recommend that the Committee assess the differences and similarities between the EB and the EPS, as well as the cost differences between the two that will be identified in Phase 2 of this project, and we look forward to ongoing discussions with the committee, as it decides whether to modify the current EPS approach, shift to the EB ratios and formulas, or establishes a model that includes a combination of each.

CHAPTER 7: STATE APPROACHES TO REDESIGNING TEACHER SALARY SYSTEMS: ATTRACTING AND RETAINING EFFECTIVE TEACHERS

There are many factors that can impact a district's ability to recruit and retain high quality teachers. These include: the level of teacher salaries; beginning and average salary levels; pay raises over time; incentives for teaching in subject area shortages (e.g., math and science); incentives for teaching in high need (most often poverty and rural) schools; and, bonuses for improving student performance. Adjustments in state aid formulas for regional differences in teacher salaries may also impact the recruitment and retention of high quality teachers.

This part of the report provides an overview of the efforts states have launched to address teacher compensation issues. To the extent they are available, research findings on the impact of those efforts are also described. Separate discussions are provided for the following issues:

- Overall salary increases including adjustments for regional cost differences
- Massachusetts signing bonus experiment
- Incentives for teaching math and science
- Incentives for teaching in high need schools
- State-designed performance incentives
- State grants to local districts to design performance pay plans
- Career ladders
- The Odden/Picus Salary Structure

Table 7.1 shows where these programs have been tried and which states have experimented with each option. A summary of each program follows. We also note that most of the programs profiled were discontinued during the Great Recession that began in 2009.

Table 7.1: Examples of Salary Incentive Programs in the United States

Type of Salary Incentive	State Programs Profiled
Overall Salary Increases	Overall findings from a multiple state study
Signing Bonuses	Massachusetts
Subject Area Shortages	Georgia, Hawaii, New York, North Carolina
High Need Schools	Arkansas, Georgia, New York, Virginia
Performance Incentives	Kentucky, Florida, Georgia, Mississippi, North Carolina
Grants to Districts to Design Performance Pay Programs	Arizona, Florida, Minnesota, Texas
Career Ladders	Arizona, Teacher Advancement Program
State Programs Developed Under the Federal Teacher Incentive Fund (TIF)	
New Salary Schedules	Odden-Picus Schedule, Tennessee

OVERALL SALARY INCREASES

Milanowski (2008) argues that pay levels matter for teachers. The higher the pay, the greater the number of quality individuals attracted to teaching – or any other occupation. This is true for beginning and average pay. So paying attention to salary levels is important if Maine school districts are to compete successfully in the labor market for quality talent for teaching.

That said, the challenge for Maine is how to set beginning and average pay levels, as well as how to determine the way in which annual pay increases are earned. The goal is to create a system that makes it possible to recruit and retain top talent in Maine's schools and links both salary levels and annual increases to teacher effectiveness.

The first issue Maine faces, as do other states, is how to define the competitive teacher labor market. Often states compare their average teacher salaries to average teacher salaries in other states, or to the national average teacher salary. The problem with this approach is that teachers generally make employment decisions in a more localized labor market. Research shows that most teachers work in schools within 50 miles of where they grew up or went to college (Boyd, Lankford, Loeb & Wyckoff, 2004). Our view, therefore, is that the most appropriate teacher labor market for a state is its own labor market. A comparable wage index (CWI) (discussed in Chapter 6, Element F) does precisely that. The remainder of this section of Chapter 7 addresses salary issues with respect to statewide averages. However we assume the averages will be adjusted across the state's labor markets with a CWI.

Education competes in the broader labor market for talent, both in recruiting new individuals into the field and in retaining effective teachers once they have entered education. Thus, to set competitive salary benchmarks, the education system should benchmark to numbers in the comparable labor market, with comparable meaning other jobs that require skills and knowledge

similar to teaching. Appropriate beginning and average salaries are the beginning and average salaries for jobs comparable to teaching. To ensure that Maine is competitive in recruiting and retaining teachers, the state should look for salary benchmarks for teachers within Maine's various regional labor markets, and not to other states or to national averages.[19]

The first step is for Maine to identify a beginning salary benchmark and an average salary benchmark for teachers. Once the latter has been set, then Maine could determine whether current average salaries are at, above or below market.

In the past, many states concluded that their average teacher salaries were below market levels. Their challenge was to determine how to raise salaries so that average salaries were where they wanted them to be in the general labor market. The strategy many states tried was across the board salary increases for all teachers. An across the board pay increase policy provides every teacher in every district a salary increase, either the same percentage increase or the same dollar increase. The goal of these programs was to boost average teacher salaries so schools and districts could be more competitive in recruiting and retaining effective teachers.

Across-the-board salary increase policy initiatives were tried in the 1980s and 1990s by several states. Labor market economists Dale Ballou and Michael Podgursky (1997) studied their longitudinal impacts and found that such policies had negative impacts on recruiting and retaining effective teachers. Overall salary increases provided incentives to *all* teachers, effective or not, to stay in teaching. But since nearly all teachers continued to teach, there was a reduction in the number of new openings, which restricted the ability of districts to use the higher salaries to recruit more effective teachers and to retain only the most effective teachers.

Ballou and Podgursky (1997) recommended that if the goal is to recruit and retain more effective teachers, states and districts should target salary increases to the most effective teachers. This more targeted approach would work to incentivize effective individuals to stay in teaching, create disincentives for ineffective teachers to stay and produce more open slots to recruit new and more effective teachers into the system.

Ballou and Podgursky's findings are supported by studies that have shown that small increases in teacher pay have relatively small impacts on teacher retention. Using a national sample, Harris and Adams (2007) found that a 1% increase in pay was associated with a decrease in teachers' probability of leaving the profession of just 0.5%. This estimate is consistent with results from several other studies of the relationship between base pay and turnover from districts (Hendricks, 2012; Clotfelter, Ladd, and Vigdor, 2011; Hansen et al, 2004; Hanushek et al, 2004, and Imazeki, 2005). These studies suggest that a 1% higher pay rate would be associated with a decline in turnover of between 0.1 and 0.4 percentage points. As a result, they generally estimate that a 10% increase in pay would be needed to substantially reduce overall teacher turnover. If that same amount of money were targeted to the effective teachers the state wants to retain, a substantially greater impact on retaining effective teachers could result.

[19] The exception would be if Maine is losing teachers to neighboring states or recruiting a high percentage of teachers from other states, a phenomenon that would need to be studied and which at this time is outside the scope of this study.

What this means for Maine is that if increases in teacher salaries are warranted as part of a set of strategies to enhance districts' ability to recruit and retain effective teachers, the increases should be substantial and not be provided to all current teachers. Instead, a redesigned salary schedule operated with effectiveness metrics derived from a new teacher evaluation system would be more effective in both recruiting and retaining effective teachers.

MASSACHUSETTS SIGNING BONUS

In response to the negative findings on the effect of overall salary increases in recruiting and retaining effective teachers, along with high failure rates on the state's new teacher licensure test, Massachusetts created a $20,000 signing bonus in 1998. The goal was to "encourage high achieving candidates who would otherwise not consider a career in teaching to enter the profession. The bonus was paid in four installments, $8,000 for the first year of teaching and $4,000 for each of three subsequent years. Bonus recipients would be eligible for each years' bonus payment as long as they were certified to teach in the state and employed as a teacher by one of the state's public schools. Nearly 4,000 individuals from forty states and eight countries applied for the program in the subsequent four years, suggesting the program was successful.

But a qualitative study of a quarter of the candidates from the first year (15 of 59 individuals) showed that most of the individuals taking the bonus were already planning to enter the teaching profession anyway and that their attraction to Massachusetts was an alternative training program (part of the signing bonus program) that accelerated their ability to get a teaching license, not the salary bonus itself (Liu, Johnson & Peske, 2004). The latter meant individuals could avoid the tuition and other costs of a traditional teacher preparation program. Moreover, many of the individuals who took the bonus left education, or at least Massachusetts, and did not earn the full four years of the bonus. The individuals who left stated that the bonus played a very small role in their decision to stay in education or teaching, and that working conditions in their school were much more important than monetary awards in their decision of whether or not to stay in teaching. Surprisingly, although large numbers of individuals from outside Massachusetts applied for the program, very few were selected so most bonus candidates were from inside the state. In addition, although the program was initially designed to place successful candidates in high need schools, less then 50% of those participating in the first four years of the program were so placed. Finally several criticisms of the seven-week summer training program suggested that it may have been inadequate to fully prepare first year teachers for the challenges of the job (see Fowler, 2009).

What this suggests for Maine is:

- Large signing bonuses might not be the most powerful factor nor the most effective way to entice individuals to enter the teaching profession
- Recruitment within the state and possibly neighboring states might be sufficient to recruit individuals to teach in Maine.
- Working conditions in schools are more important for retaining individuals in teaching than are financial incentives
- If Maine desires a national approach for finding educator talent, it might consider working with Teacher For America, a national organization expert in recruiting top talent

into rural schools (for the rationale, see Odden, 2013)

INCENTIVES TO TEACH IN SUBJECT AREAS WITH SHORTAGES

Several states have launched policies to provide incentives for teachers in areas experiencing shortages – usually mathematics and science, and often special education and ELL or LEP teachers.

Georgia implemented a program that, after the State Board identified subjects with teacher shortages, provided a pay increase equal to one additional step on the state's minimum teacher salary schedule for teaching in those subject areas. The increase was provided for each of three years, with funding provided by the state. We could find no information on the results of this program or its ability to attract teachers to these hard to teach areas.

Hawaii adopted a program focused on recruiting special education teachers in specified regions of the state. New teachers with one year of satisfactory teaching were eligible, as well as dual licensed teachers who decided to return to a special education classroom. The incentive was $3,000 a year for a maximum of three years. We could find no information on results.

New York State initiated a program focused on teachers both in hard-to-staff subjects and hard-to-staff schools. The purpose of the program was to provide incentives to teachers employed for the first time in a public school district. Awards were provided annually and were renewable for three additional years. The awards were $3,400 a year for a maximum of four years, or a total maximum award of $13,600. The awards were in addition to, and not part of, the teacher's base pay. We could find no information on results.

In 2001, North Carolina introduced a salary bonus program that paid up to $1,800 to certified teachers of math, science and special education in eligible middle and high schools. To be eligible, schools had to meet one of the following criteria: more than 80 percent of its students had to receive free or reduced price lunches; or the failure rate on both Algebra 1 and Biology end-of-course tests had to exceed 50 percent. The goal of the bonus program was to use financial incentives to induce teachers of subjects in short supply to teach in schools serving educationally disadvantaged students. Funding for this initiative was provided for two years and then discontinued. Clotfelter, Glennie, Ladd and Vigdor (2005) evaluated the program and found that it had very modest success in recruiting teachers into the identified schools.

These programs are typical of the kinds of salary incentives states have created for subject area shortages. The incentives tend to be small and are generally provided as an annual bonus, although the bonus might be earned for each of 3-4 years. The incentive is usually given to individuals already teaching in these areas, limiting the program's ability to encourage more individuals to enter the designated subject areas. The programs rarely have an "effectiveness" screen. As long as the teacher has a license in the subject area where there is a shortage, the teacher gets the bonus, whether or not there is evidence the individual is an effective teacher. Funding is usually dropped after a few years, even though the shortages continue. Finally, states rarely launch studies to determine whether the programs have the desired impacts. From

research we have found, programs had modest impacts and most have been discontinued with little information on their effects.

If Maine decides to establish a program of incentives for hard to teach subject areas, it should consider larger incentives, ensure that the incentives are provided only to effective teachers, provide funding for the long term, and undertake research studies to determine program impact.

INCENTIVES TO TEACH IN HIGH NEED SCHOOLS

State programs for high need schools generally focused on high poverty schools in urban communities. Similar to programs for subject area shortages, these programs rarely had an effectiveness screen resulting in provision of the incentive to any teacher, effective or not, willing to stay at or move to, a high need school.

The Arkansas program provided, at the beginning of the year, a $4,000 signing bonus for new teachers, with an additional $3,000 for each of the next two years if the teacher stayed in the district. Teachers already working in a high need school received a retention bonus of $2,000 at the beginning of the year for each of a maximum three-years. For both incentives, if the teacher left the district during that time period, the teacher would need to pay back the bonus from the preceding year. There was no effectiveness screen for teachers to be eligible for the bonus. We are unaware of any evaluation information on impacts.

Georgia's program for subject area shortages was assumed to apply to high need schools, as those were the schools with the largest shortages of teachers in the designated subjects. The incentive was an additional step on the salary schedule and as stated in the previous section, we found no information on results.

New York's Teachers of Tomorrow program was established in 2000 to assist school districts in the recruitment, retention and certification activities necessary to increase the supply of qualified teachers in school districts experiencing a teacher or subject area shortage, especially Schools Under Registration Review (SURR) which was New York's definition of persistently low performing schools. The incentive was $3,400 annually over a total maximum of 4 years, for a total cumulative award of $13,600. We could find no information on impacts.

Virginia created the Model Incentive Program to attract and retain "highly qualified" teachers in Virginia's hard-to-staff schools. Begun as a pilot program in 2005, the program provided a one-time hiring incentive of $15,000 to teachers who met the eligibility criteria and who agreed to move to a hard-to-staff middle or high school in one of the two participating school divisions. The relocating teachers had to agree to teach in the hard-to-staff school for at least three years and participate in training during the first year of the pilot program and in a formal support network during year two. Highly qualified teachers already in the schools received a one time $3,000 retention bonus. All eligible qualified teachers also had priority funding to seek Board Certification from the National Board for Professional Teaching Standards. The state provided $500 stipends during both years of the pilot to cover expenses related to training and professional development. Eligible teachers had to satisfy three criteria: 1) documented evidence of average or better student performance in the teaching area consistent with significant improvement in

student achievement; 2) above average or better performance evaluations supported by outstanding classroom observation reports for the last three consecutive years; and 3) letters of outstanding recommendations. The program was initially funded in the first year with Federal Title II funds but state funding was insufficient to cover future costs and the program was dropped after a few years. We found no information on program impacts.

For over a decade, Florida has had both signing and retention bonuses of $850 for teachers entering, moving to or remaining in low performing schools, i.e., those schools earning a "D" or "F" on the state's school accountability system. We could find no information on program impact.

An important study of bonuses for teaching in low-performing schools, conducted by Mathematica Policy Research for the Institute of Education Sciences (Glazerman et al, 2012), is just concluding. This study suggests that compensation incentives alone may not be sufficient to staff low-performing schools with more effective teachers. Though a substantial bonus was available ($20,000 for moving to a low performing school for two years) only 24% of the eligible teachers (identified based on high value-added estimates of effectiveness) applied to transfer. Ultimately, only 6% of those eligible transferred to the target schools. The bonus program did not provide the low-performing schools with substantially larger numbers of applicants. The study also suggested that a substantial effort is required to recruit interested teachers and help match teachers to vacancies. Among the important findings from this study are that it may be necessary to use a combination of financial and non-financial incentives to increase the supply of effective teachers to low performing schools, and that active recruitment and placement efforts need to supplement higher pay. It is also possible that the short-term nature of the bonus program discouraged teacher interest. It may be necessary to commit to a substantial number of years of higher pay to overcome teachers' reluctance to leave schools where they are comfortable.

These programs follow a general trend in teacher incentive programs of providing modest bonuses, ending funding after a few years, collecting little if any data on impacts, engaging in little if any active recruiting, and except for Virginia, having weak criteria to insure that only effective teachers received the bonuses.

The conclusion for Maine is similar to what we noted for subject area shortages. If Maine adopts incentives for high need schools, including rural schools, the incentives should be sufficiently large to recruit and retain teachers, only effective teachers should be eligible to receive them, the state should launch efforts to recruit candidates, and the state should fund studies of program impact.

PERFORMANCE INCENTIVES

Several states have designed and implemented performance incentives; initially such programs were targeted to all teachers in schools that had boosted student performance, but more recent programs have targeted individual teachers.

The oldest state sponsored performance-based incentive programs were school-based, and provided all teachers and administrators in award schools with bonuses. For example, Kentucky's program operated during the 1990s and was based on school wide improvements in the performance of cohorts of students over time (this year's grade 4, 8, or 10 students versus last year's grade 4, 8, or 10 grade students). Awards were in the range of $2,000 per teacher.

Charlotte-Mecklenburg, an urban district within North Carolina (see the state's program below), began a bonus program on its own before the state acted, and then modified its program to conform to the state program. Using expectancy theory to study the effects of these programs over about three years, Kelley, Heneman and Milanowski (2002) found that the bonuses were provided only when schools boosted performance beyond historical trends, that teachers supported the goal clarification the programs provided and liked the monetary bonus. They further found that the programs worked best when principals supported the goals of the program (mainly increased student achievement in state tested subjects) and orchestrated the school around initiatives designed to help teachers attain the goals – no disruptions during math and reading periods, extensive and ongoing professional development, and collaboration with teachers on how to get the job done.

The Florida School Recognition Program provides public recognition and financial awards to schools that have sustained high student performance or schools that demonstrate substantial improvement in student performance. The Florida Legislature created the program in 1997 and appropriated funds for awards in 1998. The A-Plus Plan for Education standardized program criteria and awards in 1999. It provides about $100 per pupil to schools that have continued to earn an "A" designation, to schools that have shown significant improvements that include moving from one grade to a higher grade designation and to schools that move a grade and sustain that movement for at least another year. The faculty and local school councils decide use of the funds and the funds can be used for bonuses for staff in schools as well as for school improvement activities. In 2012, 1,696 of 3,629 Florida public schools received awards.

Georgia had two performance incentives. For the school-based program, which ran from 1993 to 2004, the State Board of Education set performance criteria to evaluate proposals submitted by local schools or systems for determining exemplary performance at the school site. The criteria related to the overall educational performance of the school in areas related to student outcomes and achievement. The criteria had to reflect the six national goals for education adopted under Georgia 2000 and socioeconomic or other demographic factors that may affect student achievement or other outcomes of education. The criteria further reflected school level improvement on identified performance criteria, such as the number of remedial and Chapter I students that achieved grade level performance. The size of the awards varied depending on state funding and the number of schools or school systems eligible, but the goal was to provide awards to schools that equaled $2,000 for each teacher in the school. Awards were provided to the school and the school's certificated personnel determined how the awards were used.

The award dollars could be given to faculty members in the form of bonuses or spent for the purpose of providing faculty sabbaticals, for instructional or other equipment, for staff development, for distribution to other school staff in the form of bonuses, or for any other expenditure deemed appropriate by the local school's certificated personnel. The Center on

Educator Compensation Reform (2008) found that the number of schools and districts participating grew from a small base to much larger numbers over time. It also found that about 60 percent of participating schools earned an award from the program, with the proportion ranging from 43 percent in the 1994–95 school year to 78 percent in the 1995–96 school year. As more schools applied to participate in the program and the approval rate increased over time, the number of schools earning an award grew each year, from 10 the first year to 116 in the seventh year, though the proportion of participating schools earning an award declined to about 50 percent during the last three years of the program.

For the program focused on individual teachers, Georgia provided teachers who acquired rights to continued employment (tenure) an increase in annual state compensation of five percent beginning the school year following any year in which the students taught by the teacher showed a significant increase in average scores on the criterion-referenced test or any other test selected by the state board of education. The state board was charged with defining "significant increase" and the increase earned was in addition to all other increases for which the teacher was eligible.

Mississippi's Performance Based Pay (MPBP) plan was designed to reward licensed education personnel at schools showing improvement in student test scores. The program was based on a standardized scores rating where all levels of schools can be judged in a statistically fair and reasonable way upon implementation. We could find no clear information on funding or impacts.

North Carolina had a performance-based pay bonus designed in the mid-1990s that operated for two decades (Johnson, et al., 1999). Individual schools received financial incentives based on student achievement growth and the proficiency rate within schools. Initially, the state used a value-added model, with no adjustments for student Socio-Economic Status (SES), to determine school growth rates. The program provided incentive awards to teachers, principals and other certified school-based staff, as well as teacher assistants. In schools that attained the High Growth standards, certified staff members each received up to $1,500 incentive awards and teacher assistants received up to $500. In schools attaining the Expected Growth standard (but less than High Growth), certified staff members each received up to $750 and teacher assistants received up to $375. The program was funded with about $100 million of state funds annually. In 2004-05, 69 percent of all schools made Expected Growth or High Growth, which was down from the 75 percent that met Expected Growth or High Growth in 2003-04.

The experience gained from these programs suggest several things to consider as Maine reviews its teacher compensation strategies:

- Performance incentive programs can be designed and operated over several years if properly funded
- These programs help to clarify for teachers and principals the most important goals of the education system
- Teachers and principals support such fiscal incentives
- The programs foster and do not detract from collaborative work in schools

To date there is no information on whether such programs *by themselves* increase student achievement. However, studies of two performance-based incentive programs operated by districts – Nashville and New York City – that randomly assigned schools and teachers to the program, found no evidence that the programs boosted student achievement (Marsh, et al., 2011; Springer, et al., 2010). Kelley, Heneman and Milanowski (2002) would argue that such programs should operate within a broader context in which the education system sets clear student performance goals, hires principals to lead schools around attaining those goals, provides teachers with multiple supports including ongoing professional development to produce the gains in student performance, and consider the performance bonus programs as reinforcing these other and broader system initiatives. Such programs do, however, target bonus incentives to schools or individuals that produce larger than historical gains in student performance.

EFFORTS TO HAVE LOCAL DISTRICTS DESIGN PERFORMANCE PAY STRUCTURES

Several states have provided funds to local districts to design their own performance pay programs including Arizona, Florida, Minnesota and Texas.

Over a decade ago, Arizona, via referendum, raised the sales tax for schools, a portion of which was set aside for locally designed performance pay programs. Though nearly all districts participated in the program, policymakers were disappointed with the programs that were developed as the locally designed programs usually made all or large portions of teachers eligible for the awards, with little distinction among teachers or schools in the allocation of the awards or award levels.

For several years, Florida required local districts to design performance pay structures, but with no additional funding. These efforts began in 1998 as part of then Governor Jeb Bush's A-Plus Education Plan. The requirement was for districts to evaluate teachers mainly on student performance, to identify those with "outstanding performance," and provide them a salary bonus equal to 5 percent of the statewide average teacher salary. However, no state money was provided and the bonus funds had to come from district salary budgets. Most districts and most teachers and their unions opposed these ideas. Many districts refused to develop programs, and most of those that did made eligibility so difficult that by design very few teachers ever earned a bonus. The program was modified over the years to identify the top 10% of teachers and then the top 25% of teachers, but never received specific state funding. In 2011, the current iteration of the program emerged. It requires every teacher to be evaluated with a system that is based 50% on a set of teaching standards (many districts use the system developed by Robert Marzano) and 50 percent based on student achievement. As a result, nearly all districts have created student tests in all subject areas that are not tested by the state. For 2011-2012, districts set cut scores for slotting teachers into 4-5 bands of effectiveness; and the Florida Department of Education reported that on average, 97+ percent of teachers were placed into categories of developing, effective, or highly effective, with less than 2.5 percent in the ineffective category.

The intent is to use the results from these evaluations to operate locally designed merit pay programs, though the 2011 evaluation results suggest that this could be very expensive as so many teachers were placed into effective or higher categories. During the 2012-13 school year,

the state will begin to set much more rigorous cut scores, hopefully making the new evaluation results more reflective of actual teacher effectiveness and more appropriate for use in a new salary schedule. At this time, districts are in the process of designing systems that would use the evaluation metrics from the 2013 evaluation standards, but only the future will tell how successful these efforts – both the new evaluation metrics and the new pay systems – will be.

Minnesota's QComp was enacted in 2005 to encourage local districts to redesign teacher salary schedules. To be eligible for the state support, the new programs required five components: 1) Career ladders for teachers; 2) job-embedded professional development; 3) instructional observations and standards-based assessments; 4) measures to determine student growth; and 5) alternative teacher compensation or performance pay. Close to 150 Minnesota districts participated but few included rigorous elements based on improved student performance and most made modest changes to the traditional salary schedule. See Heneman (2008) for an overview.

The Texas Educator Excellence Awards Program, began in 2006, provided grants to school districts for the purpose of providing incentive payments to employees under the terms of locally developed awards plans approved by the Commissioner. The goal of both programs was to reward teachers who had a positive impact on improving student achievement. Incentive payments and award payments for individual teachers were based on student learning gains and collaboration with other faculty and staff resulting in overall student achievement. Teachers serving in critical shortage areas and hard to staff schools could also be awarded incentives. State appropriations could not exceed $100 million for the 2006-2007 school year and state costs for fiscal year 2008 were estimated at $261 million in general revenue, increasing to $328 million by fiscal year 2011. An external evaluation of the impacts of this program (Springer et al., 2009) found that: most eligible schools participated; most of the awards were targeted to individual teachers; the award amounts varied around $3,000 (though the state had recommended lower minimums and maximums to $10,000); most teachers and administrators supported performance pay and claimed the program did not deter collaboration among teachers; and that the program did not reduce teacher turnover and had no discernable impact on student achievement.

We conclude that deferring the design of new compensation systems to local districts, without clear guidance or limitations on the structure of the elements of the systems, has not been very successful. Few districts have the will or inclination to make distinctions among teachers either in their level of performance or awards for improved performance. While there is hope that the current fervor in restructuring teacher evaluation systems, which in the past have typically found 95+% of teachers satisfactory even when student performance is dismal, the early results from those efforts have dimmed that hope. New evaluation systems in Florida, Georgia and Michigan, where local districts made decisions on cut scores for different performance categories, found that 95+% of all teachers in each state were developing, effective or accomplished, just like the older systems.

Our conclusion from this is that states need to take lead roles in designing new salary schedules for teachers, allowing collective bargaining to determine details but on basic and more rigorous

structures specified by the state. Specifically, if new salary schedules based on new metrics of teacher effectiveness are to work, states need to be more involved in setting cut scores.

CAREER LADDER PROGRAMS

State experiences with career ladder programs have fallen short of success. Career ladder programs were most popular in the 1990s and early 2000s. As a way to identify and retain the best teachers, the concept was to identify three or so career ladder levels and use performance metrics to make teachers eligible for entrance into the various career levels. Most plans deferred to districts to design the programs, as well as to designate the work tasks and reward levels for teachers in the different career levels. Disappointment with the programs led to the demise of nearly all programs, with the longest lasting one in Arizona, though it was never expanded from the 28 districts that initially participated.

Today, the program most closely aligned with a career ladder is the Teacher Advancement Program (TAP), originally created by the Milken Family Foundation (Center on Education Compensation Reform, 2010). This program uses rigorous teacher evaluation methods – a measure of teaching practice adopted from the Danielson Framework (2007) and value-added metrics of teacher impact on student achievement – to slot individuals into career positions of lead teacher and master teacher. To use those individuals, the program organizes schools into teams, each coordinated by a team leader, and provides extensive ongoing professional development supported by "master teachers," what most today would call instructional coaches. The TAP program has substantial potential for both improving teachers' instructional practice as the school is organized to do, and as an effective new way to structure how teachers are paid (see for example, Jerald, 2009).

STATE PROGRAMS DEVELOPED UNDER THE FEDERAL TEACHER INCENTIVE FUND (TIF)

Several states have participated in the US Department of Education's Teacher Incentive Fund (TIF) program, which provided incentives for developing performance-based compensation for teachers and principals. Of the 62 Round three and 35 Round four grants currently in operation, states sponsored eight of the Round three and four of the Round four programs. Maine sponsored a program covering six districts for TIF 4, following up on a TIF 3 grant in which four districts participated under the auspices of the National Board for Professional Teaching Standards. The TIF program targets high–need schools; thus state–sponsored TIF programs do not include all of the state's districts. However, TIF provides a way for states to try out performance-based compensation at the local level before implementing it statewide.

In the first three rounds of the TIF program, almost all grantees used one-time bonuses to recognize high performance at the school or teacher level. Only one grantee (Harrison County, Colorado) revised the traditional pay structure to include performance as a determinant of pay progression. In the fourth round, the Federal government put more emphasis on rewards based on individual teacher performance (as opposed to school-wide or grade-level performance) and required rewards to be based substantially on measures of student achievement growth. TIF 4

also requires that grantees use teacher and principal evaluation systems that include student growth as a component. Meeting these requirements has required grantees to develop the tools needed to implement reforms in pay schedules. While TIF 4 also did not require changing the traditional pay schedule, some grantees received extra points in the grant competition for proposing to do so. Five Round 4 grantees are using TIF as an opportunity to develop new base pay schedules that would use metrics from a performance evaluation to determine pay progression all or in part. State grantees taking this approach include Tennessee (planning and piloting) and the District of Columbia (in limited use).

NEW SALARY SCHEDULES

There are a few emerging efforts to redesign the entire salary schedule, using results of effectiveness from new teacher evaluation efforts. We profile two such efforts: a generic approach Odden and Picus have developed, and the pilot program currently operating in Tennessee.

The Odden-Picus Salary Schedule Approach to Recruiting and Retaining Effective Teachers[20]

Odden and Picus have designed a salary schedule that draws on the fact that the education system has the ability to measure a teacher's instructional practice in ways that categorize teachers by their effectiveness in producing student learning gains (e.g., Milanowski, 2004; Measures of Effective Teaching Project, 2012; Milanowski, Kimball, and Odden, 2005; Tyler, et al., 2010). Using measures of practice, student data and student surveys, the education system can produce valid and reliable metrics of teachers' effectiveness. In most education systems developing these systems, the metrics produced result in four or five effectiveness categories. As indicated above, when establishing these effectiveness categories, states need to be involved to ensure the cut scores between categories are rigorous. Although there are many ways that such effectiveness measures could be used to redesign a teacher salary schedule, the following example assumes a well developed four level metric of teacher effectiveness exists[21] and provides the long-term vision for how an effectiveness-based salary schedule could work (see also Heneman & Kimball, 2008; Milanowski, 2003; Odden and Wallace, 2007).

Before describing this model, we note that such effectiveness metrics can be a central part of overall changes in human capital management systems with all programs – recruitment, placement, distribution, promotion/tenure, performance management, compensation and dismissal – informed by measures of effectiveness. Such programs have been labeled "strategic human capital management" systems (see Odden, 2011). Further, the 2012 federal TIF regulations require states and districts that apply for this round of TIF grants to first develop

[20] This section is an edited version of a part of Chapter 11 in our forthcoming school finance text: *School Finance: A Policy Perspective, 5th Edition*. New York: McGraw Hill.

[21] We note again that the systems now being developed across the country have not been rigorous in setting cut points that determine different performance levels, thus categorizing 95+% of all teachers as effective or better. Such systems would not be useful in running the salary schedule we propose as it would move nearly all teachers into the top categories, allegedly on the basis of effectiveness.

"human capital management systems" to operate *all* their human resource management programs, with measures of effectiveness a central feature of each program. The regulations, correctly from our perspective, argue that this is the systemic approach for developing compensation systems that use effectiveness metrics, thus making new effectiveness-based compensation systems part of an overall human capital management system that signals that teacher effectiveness is the prime goal and the route to higher levels of student achievement.

A framework for an ambitious effectiveness-based teacher salary schedule is displayed in Table 7.2.[22] The three-lane model shown provides financial incentives for some degrees. The schedule has four effectiveness categories, and while it retains the structure of the current single salary schedule, as there are several rows and three columns, it represents substantial change. For most states and districts, including Maine if it were to adopt such a system, this schedule would replace a 20 plus step and 6 plus lane traditional schedule. The smaller number of columns sends the signal that miscellaneous units will no longer be rewarded. The units must earn a master's degree, and then a doctorate or specialist certificate, and only in the area in which a teacher is licensed and works. Though the number of rows is reduced, the key aspect of this schedule is that it includes four effectiveness and pay categories that are determined by a teacher's performance on a newly designed performance-based evaluation system, such as is being developed in Maine. The schedule could be augmented with a fifth level of effectiveness if the Maine system produces that number of performance categories.

[22] All the specific salary numbers and percentages are placeholder numbers and can be set at appropriate levels by any state or local school district.

Table 7.2 Proposed Teacher Salary Schedule Based on Multiple Measures of Teacher Effectiveness

		Step Within Level	BA	MA	MA 60/ Doctorate
Entry	Level 1 Effectiveness	1	$40,000	$41,600	$43,264
		2	$40,600	$42,224	$43,913
		3	$41,209	$42,857	$44,572
Emerging Professional	Level 2 Effectiveness	1	$45,330	$47,143	$49,029
		2	$46,010	$47,850	$49,764
		3	$46,700	$48,568	$50,511
		4	$47,400	$49,297	$51,268
		5	$48,112	$50,036	$52,037
		6	$48,833	$50,787	$52,818
Professional	Level 3 Effectiveness	1	$56,158	$58,405	$60,741
		2	$57,000	$59,281	$61,652
		3	$57,855	$60,170	$62,577
		4	$58,723	$61,073	$63,515
		5	$59,604	$61,989	$64,468
		6	$60,498	$62,919	$65,435
Master	Level 4 Effectiveness	1	$72,598	$75,503	$78,522
		2	$73,687	$76,635	$79,700
		3	$74,792	$77,785	$80,895
		4	$75,914	$78,951	$82,109
		5	$77,053	$80,136	$83,340
		6	$78,209	$81,338	$84,590

Notes:

Percent increase for effectiveness level:	Level 2: 10%; Level 3: 15%; Level 4: 20%
Percent increase for step:	1.5%
Math and science incentive:	10 %
MA, MA60/Doctorate in license field	4 %
National Board Certification	10 %

The schedule works the following way. Pay increases would be large for movement across effectiveness categories and much smaller for step movements within categories. In the example given, the step increases within effectiveness categories are just 1.5 percent while the effectiveness category increases are 10 percent for moving from category 1 to 2, 15 percent for moving from category 2 to 3, and 20 percent for moving from category 3 to 4. The salary increases become larger as the teacher's effectiveness reaches higher levels. The message is that teacher instructional performance – effectiveness – is the main way to earn salary increases.

Initially, teachers would be screened for "Entry"; this is most likely the preliminary license provided through a postsecondary training program, or perhaps some type of alternative training

program. During the time in "Entry," teachers would be involved in intense and focused new-teacher induction/mentoring programs.

Next, teachers go through a performance evaluation at the end of year three. Full, comprehensive evaluations with measures of teaching practices and multiple measures of student data are time consuming and should only be conducted every three or so years. Teachers who meet the effectiveness standards would move into the "Emerging Professional" level. If their performance did not rise to that level by the end of year three, the teacher would lose his or her job in the district. Thus the entry level includes an "up-or-out" element based on individual performance.

In many states that have a two-tiered licensing system (National Council on Teacher Quality, 2011; Youngs, Odden, and Porter, 2003), moving into "Emerging Professional" could coincide with earning the professional license, which is usually done through a performance assessment of the individual's instructional practice.

After earning the standard license and being in the "Emerging Professional" category, teachers would continue with ongoing professional development and undergo a periodic performance assessment. Toward the end of the third year in that category, teachers could request an assessment, and if their performance met the standards for the next category, they could jump to "Professional" step one. If they were unable to meet the performance standards of the Professional category, they would continue to receive step increases in Level two but their salary would be capped at "Emerging Professional" step six.

The system could require that teachers meet the "Professional" standard in order to stay in the system—potentially a new tenure standard. If the professional license is granted after a teacher has been working for two to four years and meets the standard for "Emerging Professional" (the time period can vary), it might make sense to postpone the tenure decision until a later time (see Odden, 2011 for a more comprehensive discussion of this issue).

Finally, once in "Professional" teachers would undergo a periodic performance assessment. Toward the end of year three in that category, teachers could request such an assessment and if their performance met the standards for the next category, they could jump to "Master," step one. However, the standards for "Master" need to be rigorous, and not all teachers would be expected to perform at this level. We would hope a large percentage would reach that level, and there should be no quota for the number of teachers who reach that advanced level of performance. As outlined, this schedule provides a fast track to the top for teachers who enhance their instructional practice and caps the salaries of those who do not.

To make operational a salary schedule like the one proposed here, Maine needs a performance evaluation system that produces at least four levels of effectiveness, with rigorous standards for movement into all effectiveness categories. (The system could be augmented with a fifth level if the evaluation system produced five effectiveness categories.) It is difficult for districts to design a salary and evaluation system from scratch so it is wise for states to be centrally involved in such efforts. Today, moreover, nearly two-thirds of states, including Maine, are creating performance-based evaluation systems, in part as a response to the federal Race to the Top program, and in part as a condition for receiving an NCLB waiver (see National Center on

Teacher Quality, 2011). By 2015 or so, Maine should have evaluation systems that include effectiveness metrics for teachers, and if sufficiently rigorous, these metrics could be used to operate a salary schedule like that depicted in Table 7.2.

To address issues like incentives for teaching in hard to staff schools – including rural schools – or hard to staff subjects, the basic salary schedule described above can be retained and incentives added.

The salary structure in Table 7.2 can be enhanced with additional incentives for the following:

- Incentive payments for teaching subject areas where there are teacher shortages, such as mathematics and science. We would advise Maine to consider incentives of at least $5,000 a year for such hard to staff subject areas if they find it difficult to employ quality teachers in those positions.
- Incentive payments of at least $5,000 per year for hard-to-staff, high-need schools, which could include rural schools.
- Incentives for certification by the National Board for Professional Teaching Standards: incentives in the 10–20 percent range ($4,000–$8,000 annually), rather than just a one-time bonus, will motivate teachers to enhance their practices to the high and rigorous standards set by the National Board. Though many policymakers have raised questions about the efficacy of National Board Certifications, research shows that only the best teachers try to earn National Board Certification, and of those who try, those who earn the certificate produce higher learning gains than those that do not earn certification (Goldhaber & Anthony,2004).

A new structure like that depicted in Table 7.2 represents a strategic way to redesign the teacher salary structure. It pays teachers largely on the basis of their instructional expertise and effectiveness. It signals that enhancing one's knowledge and skills is the way to higher pay levels, and it links the highest pay to the most effective teachers. Long term, a structure that resembles that in Table 7.2 should be a strategic goal for many states and local districts and would be an effective way to recruit and retain highly effective teachers, assuming the salary levels were appropriately benchmarked to Maine's labor markets for teachers and other comparable jobs.

Because a schedule such as that depicted in Table 7.2 is a dramatic change from current teacher salary schedules, Maine could transition into it over time. A first step would be to create a performance evaluation system, as the state currently is doing. The prime challenge will be for the state to set rigorous requirements for entry into effective or higher performance categories.

In the first several years, the score on the evaluation system could be used to trigger a salary incentive on top of the state or district's single-salary structure. This would entail grafting a new element onto the old structure. After the performance evaluation system is up and running, and really differentiates teachers by their effectiveness, more dollars could be directed to the incentive element of the system. At some point, all new dollars could be put into the incentive element based on the evaluation score. Then a transition to the structure depicted in Table 7.2 could occur. In this way, some portion of pay would initially be contingent on the level of a teacher's instructional expertise and effectiveness, over time the evaluation system could shift so

the level of a teacher's effectiveness on the performance assessment/evaluation would be the major determinant of the teacher's pay.

For such a salary schedule, Maine would need to determine the actual benchmark figures for the beginning salary with a BA, the salary where the bulk of teachers might be placed (e.g., Professional, step six), and the various percentage increases within and across effectiveness categories. We note also that such a schedule could be used as a minimum for the "average" district with all numbers adjusted by the CWI regional index.

Tennessee

Tennessee is beginning to develop salary structures like the Odden-Picus schedule discussed above, i.e., using the results of its new performance evaluation of teachers, based 50 percent on instructional practice and 50 percent on student growth as measured by a value-added model, to drive increases in salary. Tennessee is urging local districts to design new and more strategic structures that use the metrics of effectiveness from the new evaluation systems to trigger salary increases. Four districts designed new structures in 2012, to be implemented in 2013. All four districts will award increases in base pay to those teachers evaluated as meeting or exceeding expectations, with larger increases for teachers with higher evaluation scores. Teachers evaluated as not meeting expectations will not receive raises. These districts also will provide bonuses for improved student achievement and for teachers taking on leadership positions in schools. These new schedules not only provide increases based on teacher performance but also are designed so that the most effective individuals can reach the top of the schedule more quickly. Tennessee also argues that these new salary structures are more sustainable because they use the funds currently in salary budgets to finance the programs, thus restructuring current salary dollars rather than just adding elements on top. Only time will tell how these initial initiatives are expanded and what the impacts and costs are over time.

SUMMARY: CONCLUSIONS AND RECOMMENDATIONS

Based on the analyses in this chapter, we offer the following conclusions:

- Maine's goal of providing regional adjustments for teacher salary differences is appropriate but the index currently in use does not appropriately control for teacher quality. It provides more resources for districts that have chosen to pay higher salaries in the past and fewer resources to districts that pay lower salaries in the past. As a result, SAU's do not have an equal chance at recruiting and retaining effective teachers.

- State efforts, including signing bonuses, to provide incentives for hard to staff subjects and hard to staff schools, have been largely ineffective. Reasons for this appear to be:

    - The incentives are often too low
    - The incentives are seldom accompanied by aggressive recruitment efforts
    - Frequently missing is an "effectiveness" screen, resulting in both effective and in effective teachers receiving the incentives

- States have not conducted studies to assess implementation and impact of the incentive programs. Consequently policy makers don't know whether or not the program was successful.

- Most state efforts to decentralize design of teacher pay incentives as well as the more ambitious performance pay systems have produced disappointing results.

- Recently adopted teacher evaluation systems that allow local districts to set "cut points' for determining different teacher effectiveness categories have not yet been shown to be effective.

- The current teacher salary structure in Maine, which like most salary structures provides pay increases based on years of experience and education, are not linked to teacher effectiveness, with the possible exception of the first two to four years of a teacher's career.

As a result of these findings from the experiences of Maine and other states, we offer the following recommendations:

1. Maine should replace its approach to providing regional adjustments to teacher salary levels and shift to either a Comparable Wage Index or a Hedonic Wage Index. The goal of these regional adjustments is to modify resource levels so each SAU has access to purchase educators of the same quality. In contrast, the current approach essentially reinforces prior salary level decisions by SAUs. Districts that pay higher salaries are provided more funds and districts that pay lower salaries are provided fewer funds, reinforcing those differences rather than adjusting for them. Both the CWI and the hedonic index provide regional adjustments for salaries but those adjustments are calibrated to allow each SAU to hire educators of the same quality.

2. To determine if current teacher salaries are at the appropriate market level, Maine should benchmark teacher salaries to salaries in Maine for jobs that are comparable to teaching, not to other states or the national average.

3. Maine should be more strategic in recruiting and retaining effective teachers by, shifting its teacher salary structure from the current system based on years of experience and education – which is not strongly linked to effectiveness – to an alternative approach such as the Odden-Picus structure. The new structure should provide major salary increases when a teacher's instructional effectiveness improves. Maine could use the results from its current efforts to change how teachers are evaluated to operate such a structure but we would further recommend that the state, not local districts, set the cut-points for the various effectiveness levels, with the recommendation that the lower bound for the effective category be set no lower than the 35th-40th percentile.

4. If, even with these changes, some SAUs continue to have difficulty staffing some schools or subject areas, Maine could provide additional incentives for hard to staff subjects or hard to staff schools. We recommend initial incentives in the $5-6,000 range for teachers moving to new hard to staff schools or districts. We also recommend that teachers who have more than

five years of experience be eligible for the incentive only if they had a performance rating of "effective" or better. Once in the new school or district, we recommend ongoing retention incentives of $4,000 per year, paid as a bonus at the beginning of the year. A comprehensive recruitment program making aggressive recruitment an integral part component of the program should accompany an incentive program like this. Finally, we recommend that the state fund ongoing analyses of the implementation and impact of the incentive programs to determine whether they are working to move effective teachers into hard to staff schools and subjects and to retain them at those sites.

5. If Maine decides to create any of these compensation incentives, the key features should be developed at the state level. Nearly all other states that have devolved the design of performance pay incentives to local districts have not been satisfied with the results.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

The material presented in Chapters 2-7 offer a comprehensive description of Maine's education funding system, particularly the EPS. This chapter first summarizes what was reported above, and then outlines our recommendations for next steps. The final decision as to what will be included in the second part of the study is, as planned, subject to our discussions with the Committee once they have reviewed this document.

SUMMARY OF STUDY FINDINGS (PART 1)

Overall, we found that the Maine's per pupil expenditures for K-12 education are among the highest in the United States – although they are comparatively low among the six New England States. Moreover, the distribution of revenues to local districts (SAUs) meets accepted levels of equity based on current school finance literature. While expenditures have grown in recent years, student performance has been relatively flat. Test scores compared to the rest of the country are relatively strong but about average in comparison with the other states in New England. The system operates well, but we identified a number of issues the state may want to consider as it moves forward in its efforts to improve learning for all children in its public schools.

Comparison with Other States

The findings from our interstate comparison can be summarized as follows:

Educational Expenditures

- From 1999-2000 to 2009-2010, state and local revenue for public K-12 education in Maine grew from $1.62 billion to $2.35 billion - an increase of just over $728.6 million or 45%. During the same time period, state and local revenue for K-12 education in all 50 states increased by 49.4% ($171.6 billion). (U.S. Census, 2012) – See Appendix 3.A for a fifty-state summary.
- Between 1999-2000 and 2009-2010, Maine's per pupil expenditures grew from $7,595 to $12,259-an increase of 61.4%. Average per pupil expenditures on a national level increased from $6,836 to $10,600- a 55.1% increase during this same time period. (U.S. Census, 2012) - See Appendix 3.B for a fifty-state summary.

Student Population

- Maine has experienced a decrease in student population of 20,533 (10%) over the past decade (2001-2002 to 2011-2012). See Appendix 3.E for a fifty-state summary.
- Average school district size has declined to 808 students – making the state's school districts the 4th smallest in the nation with an average enrollment that is 25.4% the size of the average school district in the United States. See Appendix 3.F for a fifty-state summary.

Staffing

- Maine has seen an increase in the number of new teachers and a slight reduction in the number of administrators in the past decade. See Appendices 3.H and 3.G for a fifty-state summary.
- When combined with the decline in student enrollments, Maine has one of the lowest student to teacher ratios in the country. See Appendix 3.I for a fifty-state summary.
- The reduced student-to-teacher ratios are a major cause of the state's increases in per pupil expenditures.

Student Achievement

- In 2011, Maine's student test results on the National Assessment of Educational Progress (NAEP) in math and reading were mixed when compared to other states
- Maine has a four-year high school graduation rate of 79.9% which is 4.4% above the national average but trails many comparable states. See Appendix 3.M for a fifty-state summary.
- Maine's New England Common Assessment Program (NECAP) test results have been flat over the past two years and trail the scores of students in New Hampshire and Vermont in math, reading and writing in all grades.

Equity Analysis

Maine has designed a school funding system that provides districts with an equitable distribution of resources. However, the differential ability of districts to raise funds above what the system requires somewhat reduces the fiscal neutrality and the equity of the system. The funding disparities appear to be based more on fiscal capacity than variation in student needs.

Overall, two patterns consistently emerge from our equity analysis of the Maine school funding system. First, we found that the system, as designed, met (or very nearly) met all of the strict benchmarks established by Odden and Picus (2014) for fiscal neutrality and equity. This finding held when we used multiple measures of both property wealth per pupil and per capita income, and when we used both weighted and unweighted pupil counts in the analysis.

The second important pattern relates to reductions in the equity and fiscal neutrality of the system when we included local revenue raised through property taxes above the level of EPS funding. The revenue equality statistics indicate that funding disparities in Maine arise to a large degree from wealth disparities across SAUs whether measured on the basis of property wealth per pupil or median per capita income. One approach for mitigating this reduction in equity is to add a second equalized tier to the school funding formula, by providing percentage power equalization or a guaranteed tax base to equalize property taxes above the required rate to fund

the required local contribution to the EPS. This would provide aid in inverse relation to a district's wealth for decisions to increase taxes to fund expenditures above the EPS level.

Another important finding relates to the vertical equity of the system. The equity of the system changes very slightly for the worse when student counts were weighted by student needs, which implies that the funding disparities were not attributable to meeting the special needs of at risk students. This finding suggests that the state might want to consider new ways of providing funds to school districts in order to help them meet the needs of their neediest students.

Tribal Funding

Our primary finding from an assessment of Tribal funding in Maine and across the United States is that each state has its own approach for funding schools for Native American children. These approaches rely on a combination of state and Federal sources and are hard to compare across states. If Maine wants to provide more funds for indigenous students, the state could encourage districts to take advantage of available Title VII funds. As of 2010, there were 16 districts with between 10 and 20 American Indian students enrolled (not including those who identify as American Indian and another race under "two or more races"), only one of which we can confirm is receiving either Title VII or Johnson -O'Malley (JOM) funds. There are 13 districts with between 21 and 50 indigenous students (again, not including those who designate themselves as American Indian and another race), only 4 of which have JOM or Title VII-funded programs. Finally, of the five districts that enroll over 50 American Indian students, three are part of Maine Indian Education, while two, Calais and Bangor, are not. In particular, the growing number of Indian students in Bangor should be served, as well as those in Calais. Those districts could apply on their own or collaborate with one or more of the tribes in Maine; there is no requirement that the American Indians served under these funds be enrolled in any specific tribe.

Likewise, districts could collaborate with tribes to extend services under Johnson-O'Malley funding, if the tribes were willing. There is not a requirement that students be enrolled in the tribe providing the services, just that they be eligible by the criteria described above. In Anchorage, Alaska, Cook Inlet Tribal Council serves any American Indian or Alaska Native student in their Johnson-O'Malley programs in Anchorage, regardless of their enrolled tribe, so long as they are eligible for the services. This may not be financially viable under the current JOM funding scheme, but it appears that the program may be revived and expanded. The state and its tribes should monitor the efforts to increase JOM funding at the national level and make sure that accurate counts of eligible children are provided to the Bureau of Indian Affairs.

Our specific findings related to tribal funding include:

- The three Maine Indian Education schools appear to receive per pupil revenues that are substantially higher than the state average funding level.

- The mix of state and federal funding for the tribal schools in Maine is set by the Maine Indian Claims Settlement Act of 1980. It would require tribal and federal agreement to modify the Act.
- Most Maine school districts that are eligible for Title VII funds (districts serving 10 or more American Indian/Alaska Native students) do not receive the funds. Districts could apply for these moneys, generally about $300 per student, which are supplemental and can be used for a broad array of approaches to support indigenous students.
- The state of Maine should decide whether or not to provide a different set of options for secondary students exiting the tribal schools, depending on whether there is evidence about whether these students are succeeding in high school.
- The Committee may want to study spending patterns in the tribal school more closely.

Comparison of EPS with EBM

In Chapter 6 we provided a side-by-side comparison of the elements of Maine's EPS with the elements of the Evidence Based Model (EB) that we have developed for use in other states. We also provide the research basis surrounding each individual issue[23].

The EB model uses a similar structure and approach to that used by the EPS in Maine. The EB model provides resources to meet all seven Learning Results categories in Maine and provides additional resources that in our view establish a comprehensive education system as called for in the Resolve. The EB model provides sufficient resources for all schools to offer a full liberal arts curriculum that offers an education program designed to meet college and career standards for all students. The EB approach is also sufficient to allow schools in Maine – if they use the resources in the most effective manner and organize teachers into collaborative groups – to dramatically increase student achievement on standardized performance tests such as the NECAP. Examples of resources that are included in the EB, but are not specifically included in the EPS include career and technical education, gifted and talented education and co-curricular activities.

The comparisons provided in Chapter 6 show a number of differences in the specific staffing ratios for different grade levels, educational programs and support services, and differences in per pupil funding levels for certain resources. It appears that in some instances the cost of EPS exceeds the EB and in others the reverse is true – EB costs exceed those of the EBM. Once we have completed our EB model for Maine during Part 2 of the study, we will be able to quantify those differences by specific program area. Examples of areas where EB funding exceeds EPS include an ongoing, systemic and comprehensives professional development program and more extra help resources for at-risk students.

We recommend that the Committee assess the differences and similarities between the EB and the EPS, as well as the cost differences between the two that will be identified in Part 2 of this

[23] Readers interested in more detail on the EB should review our textbook, *School Finance: A Policy Analysis, 5th Edition*. (Odden & Picus, 2014).

project, and we look forward to ongoing discussions with the Committee as it decides whether to modify the current EPS approach, shift to the EB ratios and formulas, or establishes a model that includes a combination of both.

In the second part of this study, we will develop a Microsoft Excel based simulation model that generates estimates of per pupil costs for general education as well as specialized programs for at risk students. The model will also estimate site leadership costs, district office costs and the costs of operations and maintenance. We will use this model to estimate a district-by-district (SAU) comparison of how our model compares both to the EBM, and to variations of the EBM suggested during our meetings with the Committee and with stakeholders and professional judgment panels in Maine.

Teacher Compensation

In Chapter 7 of this study, we reviewed the current teacher compensation system in Maine and reviewed other state and district level teacher compensation reforms focused on improving teacher effectiveness. Unfortunately, many of these initiatives have not been carefully studied so the strengths and weaknesses of each are hard to discern. With that context in mind, we reached the following conclusions about teacher compensation issues in Maine:

- Maine's goal of providing regional adjustments for teacher salary differences is appropriate but the index currently in use does not appropriately control for teacher quality. As a result, it provides more resources for districts that have chosen to pay higher salaries in the past and fewer resources to districts that paid lower salaries in the past. As a result, all SAUs do not have an equal opportunity to recruit and retain effective teachers.

- State efforts to provide incentives for hard to staff subjects and hard to staff schools, including signing bonuses, have been largely ineffective. Reasons for this appear to be:

    - The incentives are often too low.
    - The incentives are seldom accompanied by aggressive recruitment efforts.
    - An "effectiveness" screen, is frequently missing, resulting in both effective and in effective teachers receiving the incentives.
    - States have not conducted studies to assess implementation and impact of the incentive programs. Consequently policy makers don't know whether or not the program was successful.

- Most state efforts to decentralize the design of teacher pay incentives as well as the more ambitious performance pay systems have produced disappointing results.

- Recently adopted teacher evaluation systems that allow local districts to set "cut points' for determining different teacher effectiveness categories have not yet been shown to be effective.

- The current teacher salary structure in Maine, which like most salary structures provides pay increases based on years of experience and education, is not linked to teacher effectiveness, with the possible exception of the first two to four years of a teacher's career.

As a result of these findings, we offer the following recommendations:

1. Maine should replace its approach to providing regional adjustments to teacher salary levels and shift to either a Comparable Wage Index or a Hedonic Wage Index. The goal of these regional adjustments is to modify resource levels so each SAU has access to purchase educators of the same quality. In contrast, the current approach essentially reinforces prior salary level decisions by SAUs by using actual salaries. As a result, districts that pay higher salaries are provided more funds and districts that pay lower salaries are provided fewer funds, reinforcing those differences rather than adjusting for them. Both the CWI and the Hedonic Wage Index provide regional adjustments for salaries but those adjustments are calibrated to allow each SAU to hire educators of the same quality.

2. To determine if current teacher salaries are at the appropriate market level, Maine should benchmark teacher salaries to salaries in Maine for jobs that are comparable to teaching, not to other states or the national average.

3. Maine should be more strategic in recruiting and retaining effective teachers by shifting its teacher salary structure from the current system based on years of experience and education – which is not strongly linked to effectiveness – to an alternative approach such as the Odden-Picus Salary Schedule. The new structure should provide major salary increases when a teacher's instructional effectiveness improves. Maine could use the results from its current efforts to change how teachers are evaluated to operate such a structure but we would further recommend that the state, not local districts, set the cut-points for the various effectiveness levels, with the recommendation that the lower bound for the effective category be set no lower than the 35th-40th percentile.

4. If, even with these changes, some SAUs continue to have difficulty staffing some schools or subject areas, Maine could provide additional incentives for hard to staff subjects or hard to staff schools. We recommend initial incentives in the $5,000-6,000 range for teachers moving to new schools or districts. We also recommend that teachers who have more than five years of experience would be eligible for the incentive only if they had a performance rating of "effective" or better. Once in the new school or district, we recommend ongoing retention incentives of $4,000 per year, paid as a bonus at the beginning of the year. An incentive program like this should be accompanied by a comprehensive recruitment program making aggressive recruitment an integral component of the program. Finally, we recommend that the state fund ongoing analyses of the implementation and impact of the incentive programs to determine whether they are working to move effective teachers into hard to staff schools and subjects and to retain them at those sites.

5. If Maine decides to create any of these compensation incentives, the key features should be developed at the state level. Nearly all other states that have devolved the design of performance pay incentives to local districts have not been satisfied with the results.

FUTURE STUDIES (PART 2)

The study design we submitted to OPEGA in November 2012 suggested four specific analyses for Part 2 of this study. Each is listed below followed (in italics) by our suggestion regarding how to proceed on this topic. As shown in the material that follows, our goal is to ensure the process moving forward is highly interactive and incorporates the concerns of the Committee and all education stakeholders.

Teacher Compensation Study, Part B

Our basic recommendation for using the teacher salary schedule as a tool to strengthen recruitment and retention of teachers was discussed above. Based on the recommendations and on discussions with the Committee we will assess our recommendations as well as alternatives suggested by the Committee in the context of the overall EPS funding system. We will emphasize the need to change the overall teacher salary structure, not just add bonus incentives to the current structure, with a focus on how these approaches impact incentives for teacher recruitment and retention.

> *We will work closely with the Committee during Part 2 to understand the alternative compensation programs they would like to consider and help develop models for how they could be designed within the rubric of the EPS or any system designed to replace or revise EPS. Included in this work will be consideration of how a new regional cost adjustment would be developed.*

Stakeholder Input

An important component of Part 2 of the independent review will be seeking feedback from the Committee and from stakeholders into the direction of our recommendations and to ensure the recommendations we make are responsive to Maine's policy makers and education stakeholders. We will coordinate our efforts through the Committee and plan to meet with the Committee at the following approximate times (subject to the Committee's schedule):

1. In late January or early February 2013 following the organization of the Legislative session to discuss the parameters of the study.

   Note: This meeting took place on February 6 along with a Committee hearing to seek stakeholder input.

2. In April 2013 to discuss the findings of the studies completed as Part 1 of the independent review

   We are scheduled to make a public presentation of this report on April 10, 2012 and to listen to public comment on the report either that day or the next.

3. Up to three more times between June and October 2013 to solicit their views on our recommendations

   At this time we anticipate a visit to Maine where we will conduct Professional Judgment Panels to review our EBM model and its comparison to the EPS. We anticipate holding these panels in three locations across the state, each to be followed by an opportunity to meet with stakeholders in public hearings. We anticipate these will take place in early September after school starts to ensure teachers can participate in the professional judgment panel meetings.

4. In December 2013 to discuss the findings of the studies completed as Part 2 of the independent review

   We will present the findings from Part 2 of the report at that time.

5. In January or Early February 2014 to describe our findings during the 2014 session of the Maine Legislature

Case Studies of Improving Schools

As described in our proposal, we will conduct in-depth case studies in a sample of 10 schools that have shown strong improvements in student achievement in recent years. Although not specifically called for in the RFP, we have included these important case studies in our proposal because it is critical to determine the degree to which the strategies for improvement deployed by these institutions align with the Theory of Action built into the Evidence-Based model on which our resource distribution recommendations will initially be based, and the degree to which our model should be adjusted to reflect practices that are more effective in Maine. In identifying the sample of schools, we will work with the Committee, its staff and others as appropriate to help identify those schools that are making the most progress in improving student performance – not those with the highest test scores, but those with the largest consistent *gains* in student outcomes.

Recommendations for Recalibration of EPS based on EB model

This component of the study will produce an estimate of adequate educational resources for Maine's SAUs based on our Evidence-Based model as modified by feedback from the Committee and from stakeholder groups as identified by and in consultation with the Committee. We will develop an Excel-based simulation model that estimates educational resources at the SAU level for all SAUs in the state for the 2012-13 school year. We will provide a working

copy of the model to the Office of Program Evaluation and Governmental Accountability (OPEGA) and to the Maine DOE.

Final Report

Based on the findings from the ten deliverables described above, we will provide a final report to the Committee and OPEGA. This document will include an executive summary of our findings and recommendations as well as the full reports. We will deliver this report by December 1, 2013, and as indicated above will be available at that time to meet with the Committee as appropriate.

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APPENDICES

Appendix 3.A
State and Local Revenue for K-12 Education
(Numbers in 1,000)
(Source: United States Census Bureau)

	1999-2000	2009-2010	Change from 1999-2000 to 2009-2010	
			Dollars	Percentages
United States	$347,289,182	$518,928,241	$171,639,059	49.4%
Comparative States	$30,733,354	$45,465,866	$14,732,512	47.9%
Alabama	$4,457,758	$6,145,640	$1,687,882	37.9%
Alaska	$1,113,913	$1,863,170	$749,257	67.3%
Arizona	$4,919,052	$7,153,698	$2,234,646	45.4%
Arkansas	$2,580,056	$4,261,686	$1,681,630	65.2%
California	$41,322,786	$55,265,651	$13,942,865	33.7%
Colorado	$4,763,695	$8,027,220	$3,263,525	68.5%
Connecticut	$5,552,489	$8,725,670	$3,173,181	57.1%
Delaware	$1,003,966	$1,514,972	$511,006	50.9%
District of Columbia	$696,598	$1,115,349	$418,751	60.1%
Florida	$16,159,912	$22,023,775	$5,863,863	36.3%
Georgia	$10,483,199	$15,237,334	$4,754,135	45.4%
Hawaii	$1,277,853	$2,182,456	$904,603	70.8%
Idaho	$1,341,306	$1,733,044	$391,738	29.2%
Illinois	$15,866,900	$23,720,561	$7,853,661	49.5%
Indiana	$7,992,293	$12,245,187	$4,252,894	53.2%
Iowa	$3,476,798	$4,805,126	$1,328,328	38.2%
Kansas	$3,273,671	$4,778,568	$1,504,897	46.0%
Kentucky	$3,901,295	$5,820,701	$1,919,406	49.2%
Louisiana	$4,227,341	$6,489,406	$2,262,065	53.5%
Maine	$1,619,065	$2,347,668	$728,603	45.0%
Maryland	$7,004,583	$12,317,318	$5,312,735	75.8%
Massachusetts	$8,911,326	$13,690,358	$4,779,032	53.6%
Michigan	$14,334,907	$16,024,762	$1,689,855	11.8%
Minnesota	$6,792,981	$8,979,361	$2,186,380	32.2%
Mississippi	$2,371,080	$3,508,942	$1,137,862	48.0%
Missouri	$6,186,093	$8,077,526	$1,891,433	30.6%
Montana	$967,182	$1,353,390	$386,208	39.9%
Nebraska	$2,056,104	$3,177,864	$1,121,760	54.6%
Nevada	$2,138,515	$3,902,895	$1,764,380	82.5%
New Hampshire	$1,473,057	$2,618,266	$1,145,209	77.7%

New Jersey	$14,559,059	$23,398,228	$8,839,169	60.7%
New Mexico	$1,894,941	$2,884,776	$989,835	52.2%
New York	$29,804,565	$51,550,059	$21,745,494	73.0%
North Carolina	$8,440,873	$14,693,425	$6,252,552	74.1%
North Dakota	$676,116	$982,902	$306,786	45.4%
Ohio	$14,350,254	$20,282,369	$5,932,115	41.3%
Oklahoma	$3,523,533	$5,009,450	$1,485,917	42.2%
Oregon	$4,065,114	$5,358,836	$1,293,722	31.8%
Pennsylvania	$15,244,247	$23,455,539	$8,213,292	53.9%
Rhode Island	$1,376,037	$1,946,128	$570,091	41.4%
South Carolina	$4,314,811	$6,683,862	$2,369,051	54.9%
South Dakota	$757,483	$1,038,974	$281,491	37.2%
Tennessee	$4,853,553	$7,277,015	$2,423,462	49.9%
Texas	$26,422,335	$42,406,439	$15,984,104	60.5%
Utah	$2,355,964	$3,675,705	$1,319,741	56.0%
Vermont	$881,626	$1,398,604	$516,978	58.6%
Virginia	$8,284,526	$13,161,041	$4,876,515	58.9%
Washington	$7,023,827	$10,429,781	$3,405,954	48.5%
West Virginia	$2,031,885	$2,662,245	$630,360	31.0%
Wisconsin	$7,442,956	$9,934,046	$2,491,090	33.5%
Wyoming	$719,703	$1,591,253	$871,550	121.1%

Appendix 3.B
K-12 Per Pupil Expenditures
(Source: United States Census Bureau)

	1999-2000	2009-2010	Change from 1999-2000 to 2009-2010	
			Dollars	Percentages
United States	$6,836	$10,600	$3,764	55.1%
Alabama	$5,601	$8,881	$3,280	58.6%
Alaska	$8,743	$15,783	$7,040	80.5%
Arizona	$5,033	$7,848	$2,815	55.9%
Arkansas	$5,470	$9,143	$3,673	67.2%
California	$6,298	$9,375	$3,077	48.9%
Colorado	$6,165	$8,853	$2,688	43.6%
Connecticut	$8,800	$14,906	$6,106	69.4%
Delaware	$8,030	$12,383	$4,353	54.2%
District of Columbia	$10,836	$18,667	$7,831	72.3%
Florida	$5,691	$8,741	$3,050	53.6%
Georgia	$6,417	$9,394	$2,977	46.4%
Hawaii	$6,487	$11,754	$5,267	81.2%
Idaho	$5,218	$7,106	$1,888	36.2%
Illinois	$7,185	$11,634	$4,449	61.9%
Indiana	$6,871	$9,611	$2,740	39.9%
Iowa	$6,547	$9,763	$3,216	49.1%
Kansas	$6,211	$9,715	$3,504	56.4%
Kentucky	$5,922	$8,948	$3,026	51.1%
Louisiana	$5,652	$10,638	$4,986	88.2%
Maine	$7,595	$12,259	$4,664	61.4%
Maryland	$7,496	$13,738	$6,242	83.3%
Massachusetts	$8,444	$13,590	$5,146	60.9%
Michigan	$7,662	$10,644	$2,982	38.9%
Minnesota	$7,051	$10,685	$3,634	51.5%
Mississippi	$5,014	$8,119	$3,105	61.9%
Missouri	$6,143	$9,634	$3,491	56.8%
Montana	$6,214	$10,497	$4,283	68.9%
Nebraska	$6,422	$10,734	$4,312	67.1%
Nevada	$5,736	$8,483	$2,747	47.9%
New Hampshire	$6,742	$12,383	$5,641	83.7%
New Jersey	$10,283	$16,841	$6,558	63.8%
New Mexico	$5,748	$9,384	$3,636	63.2%
New York	$10,039	$18,618	$8,579	85.5%

North Carolina	$5,990	$8,409	$2,419	40.4%
North Dakota	$5,830	$10,991	$5,161	88.5%
Ohio	$6,999	$11,030	$4,031	57.6%
Oklahoma	$5,394	$7,896	$2,502	46.4%
Oregon	$7,027	$9,624	$2,597	37.0%
Pennsylvania	$7,824	$12,995	$5,171	66.1%
Rhode Island	$8,242	$13,699	$5,457	66.2%
South Carolina	$6,114	$9,143	$3,029	49.5%
South Dakota	$5,521	$8,858	$3,337	60.4%
Tennessee	$5,343	$8,065	$2,722	50.9%
Texas	$6,145	$8,746	$2,601	42.3%
Utah	$4,331	$6,064	$1,733	40.0%
Vermont	$7,938	$15,274	$7,336	92.4%
Virginia	$6,839	$10,597	$3,758	54.9%
Washington	$6,394	$9,452	$3,058	47.8%
West Virginia	$7,093	$11,527	$4,434	62.5%
Wisconsin	$7,716	$11,364	$3,648	47.3%
Wyoming	$7,421	$15,169	$7,748	104.4%

Appendix 3.C
K-12 Education Spending Per $1,000 of Personal Income
(Source: National Education Association's Rankings & Estimates publication)

	1999-2000	2009-2010	Change from 1999-2000 to 2009-2010	
			Dollars	Percentages
United States	$41	$41	$0	0.0%
Alabama	$35	$37	$2	5.7%
Alaska	$56	$63	$7	12.5%
Arizona	$37	$42	$5	13.5%
Arkansas	$40	$44	$4	10.0%
California	$39	$36	-$3	-7.7%
Colorado	$34	$38	$4	11.8%
Connecticut	$42	$43	$1	2.4%
Delaware	$41	$51	$10	24.4%
Florida	$34	$30	-$4	-11.8%
Georgia	$46	$46	$0	0.0%
Hawaii	$37	$41	$4	10.8%
Idaho	$43	$43	$0	0.0%
Illinois	$39	$40	$1	2.6%
Indiana	$48	$46	-$2	-4.2%
Iowa	$44	$40	-$4	-9.1%
Kansas	$43	$43	$0	0.0%
Kentucky	$40	$42	$2	5.0%
Louisiana	$41	$39	-$2	-4.9%
Maine	$46	$50	$4	8.7%
Maryland	$39	$44	$5	12.8%
Massachusetts	$36	$43	$7	19.4%
Michigan	$40	$38	-$2	-5.0%
Minnesota	$43	$41	-$2	-4.7%
Mississippi	$41	$37	-$4	-9.8%
Missouri	$40	$43	$3	7.5%
Montana	$47	$38	-$9	-19.1%
Nebraska	$37	$38	$1	2.7%
Nevada	$36	$33	-$3	-8.3%
New Hampshire	$37	$45	$8	21.6%
New Jersey	$42	$52	$10	23.8%
New Mexico	$48	$43	-$5	-10.4%
New York	$45	$46	$1	2.2%
North Carolina	$35	$32	-$3	-8.6%
North Dakota	$37	$31	-$6	-16.2%

Ohio	$45	$41	-$4	-8.9%
Oklahoma	$39	$35	-$4	-10.3%
Oregon	$41	$40	-$1	-2.4%
Pennsylvania	$43	$50	$7	16.3%
Rhode Island	$41	$53	$12	29.3%
South Carolina	$46	$45	-$1	-2.2%
South Dakota	$39	$32	-$7	-17.9%
Tennessee	$31	$32	$1	3.2%
Texas	$45	$44	-$1	-2.2%
Utah	$45	$44	-$1	-2.2%
Vermont	$53	$61	$8	15.1%
Virginia	$38	$38	$0	0.0%
Washington	$37	$36	-$1	-2.7%
West Virginia	$52	$49	-$3	-5.8%
Wisconsin	$48	$46	-$2	-4.2%
Wyoming	$53	$62	$9	17.0%

Appendix 3.D
K-12 Expenditures as a Percentage of Total State Expenditures
(Source: National Association of State Budget Officers)

	1999-2000	2010-2011	Change from 1999-2000 to 2010-2011
United States	22.5%	20.2%	-2.3%
Alabama	25.0%	24.9%	-0.1%
Alaska	17.8%	11.0%	-6.8%
Arizona	19.6%	20.0%	0.4%
Arkansas	19.5%	17.2%	-2.3%
California	27.4%	19.8%	-7.6%
Colorado	19.0%	23.9%	4.9%
Connecticut	13.9%	14.2%	0.3%
Delaware	22.3%	24.5%	2.2%
Florida	18.7%	21.8%	3.1%
Georgia	24.7%	25.2%	0.5%
Hawaii	17.1%	15.3%	-1.8%
Idaho	19.0%	25.5%	6.5%
Illinois	20.9%	18.9%	-2.0%
Indiana	25.6%	32.2%	6.6%
Iowa	19.7%	17.7%	-2.0%
Kansas	29.5%	26.0%	-3.5%
Kentucky	26.3%	19.7%	-6.6%
Louisiana	19.5%	16.6%	-2.9%
Maine	19.9%	13.7%	-6.2%
Maryland	17.5%	21.0%	3.5%
Massachusetts	14.4%	11.6%	-2.8%
Michigan	31.6%	27.6%	-4.0%
Minnesota	24.9%	22.9%	-2.0%
Mississippi	21.1%	14.8%	-6.3%
Missouri	24.1%	23.1%	-1.0%
Montana	20.6%	15.1%	-5.5%
Nebraska	16.7%	16.3%	-0.4%
Nevada	17.0%	21.5%	4.5%
New Hampshire	28.7%	22.3%	-6.4%
New Jersey	22.5%	24.4%	1.9%
New Mexico	24.1%	18.9%	-5.2%
New York	20.7%	20.7%	0.0%
North Carolina	23.6%	18.3%	-5.3%
North Dakota	17.3%	15.8%	-1.5%
Ohio	18.2%	17.7%	-0.5%

Oklahoma	24.3%	14.6%	-9.7%
Oregon	29.5%	11.0%	-18.5%
Pennsylvania	18.8%	19.5%	0.7%
Rhode Island	16.6%	14.4%	-2.2%
South Carolina	16.9%	17.3%	0.4%
South Dakota	13.7%	16.3%	2.6%
Tennessee	18.6%	17.3%	-1.3%
Texas	30.3%	30.0%	-0.3%
Utah	27.2%	23.2%	-4.0%
Vermont	20.5%	31.9%	11.4%
Virginia	18.1%	15.8%	-2.3%
Washington	23.9%	23.3%	-0.6%
West Virginia	26.0%	10.4%	-15.6%
Wisconsin	19.5%	17.3%	-2.2%
Wyoming	NA	3.8%	NA

Appendix 3.E
Total Student Enrollment
Based on Fall Enrollment Numbers
(Source: National Education Association's Rankings & Estimates publication)

	2001-2002	2011-2012	Change from 2001-2002 to 2011-2012	
			Enrollment	Percentages
United States	47,301,299	49,137,726	1,836,427	3.9%
New England States	2,213,938	2,096,983	-116,955	-5.3%
Comparative States	3,579,231	3,464,097	-115,134	-3.2%
Alabama	726,367	736,339	9,972	1.4%
Alaska	134,358	127,699	-6,659	-5.0%
Arizona	915,656	1,072,826	157,170	17.2%
Arkansas	448,246	468,190	19,944	4.4%
California	6,141,363	6,204,065	62,702	1.0%
Colorado	742,145	854,234	112,089	15.1%
Connecticut	569,540	554,398	-15,142	-2.7%
Delaware	115,484	129,917	14,433	12.5%
Florida	2,495,969	2,661,945	165,976	6.6%
Georgia	1,470,634	1,684,430	213,796	14.5%
Hawaii	184,546	177,734	-6,812	-3.7%
Idaho	246,415	289,486	43,071	17.5%
Illinois	2,066,775	2,087,628	20,853	1.0%
Indiana	996,006	1,040,313	44,307	4.4%
Iowa	485,932	496,009	10,077	2.1%
Kansas	470,205	482,796	12,591	2.7%
Kentucky	631,117	659,089	27,972	4.4%
Louisiana	730,252	703,390	-26,862	-3.7%
Maine	205,586	185,033	-20,553	-10.0%
Maryland	860,640	854,086	-6,554	-0.8%
Massachusetts	973,142	952,370	-20,772	-2.1%
Michigan	1,720,570	1,543,573	-176,997	-10.3%
Minnesota	851,368	839,738	-11,630	-1.4%
Mississippi	492,198	490,037	-2,161	-0.4%
Missouri	890,195	905,755	15,560	1.7%
Montana	151,947	139,650	-12,297	-8.1%
Nebraska	283,791	300,996	17,205	6.1%
Nevada	356,814	470,068	113,254	31.7%
New Hampshire	206,847	190,931	-15,916	-7.7%

New Jersey	1,341,504	1,361,813	20,309	1.5%
New Mexico	320,044	333,643	13,599	4.2%
New York	2,839,536	2,617,556	-221,980	-7.8%
North Carolina	1,321,630	1,430,007	108,377	8.2%
North Dakota	105,217	95,858	-9,359	-8.9%
Ohio	1,804,585	1,875,491	70,906	3.9%
Oklahoma	622,154	665,841	43,687	7.0%
Oregon	551,522	560,950	9,428	1.7%
Pennsylvania	1,821,627	1,750,104	-71,523	-3.9%
Rhode Island	157,956	137,175	-20,781	-13.2%
South Carolina	669,701	721,398	51,697	7.7%
South Dakota	125,612	124,739	-873	-0.7%
Tennessee	907,774	959,322	51,548	5.7%
Texas	4,146,653	4,978,120	831,467	20.1%
Utah	477,801	597,397	119,596	25.0%
Vermont	100,867	77,076	-23,791	-23.6%
Virginia	1,163,094	1,260,334	97,240	8.4%
Washington	1,010,424	1,045,987	35,563	3.5%
West Virginia	282,232	282,091	-141	0.0%
Wisconsin	879,361	871,105	-8,256	-0.9%
Wyoming	87,897	88,994	1,097	1.2%

Appendix 3.F
Average Student Enrollment Per School District
(Source: Education Commission of the States calculations
based on data from the National Education Association)

	2001-2002	2011-2012	Change from 2001-2002 to 2011-2012	
			Average Size	Percentages
United States	3,121	3,178	57	1.8%
New England States	1,731	1,584	-147	-8.5%
Comparative States	1,724	1,650	-74	-4.3%
Alabama	5,675	5,578	-96	-1.7%
Alaska	2,535	2,365	-170	-6.7%
Arizona	1,458	1,711	253	17.4%
Arkansas	1,446	1,829	383	26.5%
California	6,210	5,954	-256	-4.1%
Colorado	4,169	4,799	630	15.1%
Connecticut	2,951	2,786	-165	-5.6%
Delaware	4,442	3,511	-930	-20.9%
Florida	37,253	39,731	2,477	6.6%
Georgia	8,170	8,594	424	5.2%
Hawaii	184,546	177,734	-6,812	-3.7%
Idaho	2,162	2,113	-48	-2.2%
Illinois	2,317	2,413	96	4.2%
Indiana	3,411	2,930	-481	-14.1%
Iowa	1,310	1,413	103	7.9%
Kansas	1,547	1,688	141	9.1%
Kentucky	3,586	3,788	202	5.6%
Louisiana	8,394	5,582	-2,811	-33.5%
Maine	886	808	-78	-8.8%
Maryland	35,860	35,587	-273	-0.8%
Massachusetts	2,609	2,381	-228	-8.7%
Michigan	2,197	1,805	-392	-17.8%
Minnesota	2,511	1,618	-893	-35.6%
Mississippi	3,238	3,224	-14	-0.4%
Missouri	1,699	1,729	30	1.7%
Montana	341	335	-6	-1.7%
Nebraska	540	1,209	669	124.1%
Nevada	20,989	27,651	6,662	31.7%
New Hampshire	1,277	1,186	-91	-7.1%

New Jersey	2,266	2,304	38	1.7%
New Mexico	3,596	3,749	153	4.2%
New York	4,051	3,766	-284	-7.0%
North Carolina	11,296	12,435	1,139	10.1%
North Dakota	483	536	53	11.0%
Ohio	2,589	1,846	-743	-28.7%
Oklahoma	1,146	1,276	130	11.3%
Oregon	2,800	2,862	62	2.2%
Pennsylvania	3,643	3,507	-136	-3.7%
Rhode Island	4,388	2,799	-1,588	-36.2%
South Carolina	7,698	8,292	594	7.7%
South Dakota	726	821	95	13.0%
Tennessee	6,578	7,106	528	8.0%
Texas	3,399	4,057	658	19.4%
Utah	11,945	14,571	2,626	22.0%
Vermont	356	269	-87	-24.4%
Virginia	8,811	9,548	737	8.4%
Washington	3,414	3,546	132	3.9%
West Virginia	5,131	5,129	-3	0.0%
Wisconsin	2,064	2,054	-10	-0.5%
Wyoming	1,831	1,854	23	1.2%

Appendix 3.G
Average Teacher Salaries
(Source: National Education Association's Rankings & Estimates publication)

	2001-2002	2011-2012	Change from 2001-2002 to 2011-2012	
			Dollar	Percentages
United States	**$44,632**	**$55,418**	$10,786	24.2%
Alabama	$37,194	$48,003	$10,809	29.1%
Alaska	$49,418	$62,425	$13,007	26.3%
Arizona	$39,973	$48,691	$8,718	21.8%
Arkansas	$36,962	$46,314	$9,352	25.3%
California	$54,348	$68,531	$14,183	26.1%
Colorado	$40,659	$49,049	$8,390	20.6%
Connecticut	$53,551	$69,465	$15,914	29.7%
Delaware	$48,363	$58,800	$10,437	21.6%
Florida	$39,275	$46,479	$7,204	18.3%
Georgia	$44,073	$52,938	$8,865	20.1%
Hawaii	$42,615	$54,070	$11,455	26.9%
Idaho	$39,591	$48,551	$8,960	22.6%
Illinois	$49,435	$57,636	$8,201	16.6%
Indiana	$44,030	$50,516	$6,486	14.7%
Iowa	$38,230	$50,240	$12,010	31.4%
Kansas	$37,093	$46,718	$9,625	25.9%
Kentucky	$37,951	$49,730	$11,779	31.0%
Louisiana	$36,328	$50,179	$13,851	38.1%
Maine	$37,300	$47,338	$10,038	26.9%
Maryland	$48,251	$63,634	$15,383	31.9%
Massachusetts	$49,242	$71,721	$22,479	45.7%
Michigan	$52,477	$61,560	$9,083	17.3%
Minnesota	$43,330	$54,959	$11,629	26.8%
Mississippi	$33,295	$41,646	$8,351	25.1%
Missouri	$36,420	$46,406	$9,986	27.4%
Montana	$34,379	$48,546	$14,167	41.2%
Nebraska	$36,236	$48,154	$11,918	32.9%
Nevada	$40,764	$54,559	$13,795	33.8%
New Hampshire	$40,002	$54,177	$14,175	35.4%
New Jersey	$53,192	$67,078	$13,886	26.1%
New Mexico	$36,440	$45,622	$9,182	25.2%
New York	$52,000	$73,398	$21,398	41.2%
North Carolina	$42,680	$45,622	$2,942	6.9%
North Dakota	$32,253	$46,058	$13,805	42.8%

Ohio	$44,019	$56,715	$12,696	28.8%
Oklahoma	$34,738	$44,391	$9,653	27.8%
Oregon	$46,081	$57,348	$11,267	24.5%
Pennsylvania	$50,599	$61,934	$11,335	22.4%
Rhode Island	$49,758	$62,186	$12,428	25.0%
South Carolina	$39,923	$47,428	$7,505	18.8%
South Dakota	$31,295	$38,804	$7,509	24.0%
Tennessee	$38,515	$47,082	$8,567	22.2%
Texas	$39,232	$48,373	$9,141	23.3%
Utah	$38,139	$48,159	$10,020	26.3%
Vermont	$39,158	$51,306	$12,148	31.0%
Virginia	$41,239	$48,703	$7,464	18.1%
Washington	$43,464	$52,232	$8,768	20.2%
West Virginia	$36,751	$45,320	$8,569	23.3%
Wisconsin	$42,232	$53,792	$11,560	27.4%
Wyoming	$37,853	$57,222	$19,369	51.2%

Appendix 3.H
Full-Time Equivalent Teachers
(Source: U.S. Department of Education's National Center for Education Statistics)

	2000-2001	2010-2011	Change from 2000-2001 to 2010-2011	
			Total FTE	Percentages
United States	**2,941,455**	**3,099,592**	**158,137**	**5.4%**
New England States	**158,435**	**162,048**	**3,613**	**2.3%**
Comparative States	**253,236**	**254,315**	**1,079**	**0.4%**
Alabama	48,194	49,363	1,169	2.4%
Alaska	7,880	8,171	291	3.7%
Arizona	44,438	50,031	5,593	12.6%
Arkansas	31,947	34,773	2,826	8.8%
California	298,021	260,806	-37,215	-12.5%
Colorado	41,983	48,543	6,560	15.6%
Connecticut	41,044	42,951	1,907	4.6%
Delaware	7,469	8,933	1,464	19.6%
District of Columbia	4,949	5,925	976	19.7%
Florida	132,030	175,609	43,579	33.0%
Georgia	91,043	112,460	21,417	23.5%
Hawaii	10,927	11,396	469	4.3%
Idaho	13,714	15,673	1,959	14.3%
Illinois	127,620	132,983	5,363	4.2%
Indiana	59,226	58,121	-1,105	-1.9%
Iowa	34,636	34,642	6	0.0%
Kansas	32,742	34,644	1,902	5.8%
Kentucky	39,589	42,042	2,453	6.2%
Louisiana	49,915	48,655	-1,260	-2.5%
Maine	16,559	15,384	-1,175	-7.1%
Maryland	52,433	58,428	5,995	11.4%
Massachusetts	67,432	68,754	1,322	2.0%
Michigan	97,031	88,615	-8,416	-8.7%
Minnesota	53,457	52,672	-785	-1.5%
Mississippi	31,006	32,255	1,249	4.0%
Missouri	64,735	66,735	2,000	3.1%
Montana	10,411	10,361	-50	-0.5%
Nebraska	20,983	22,345	1,362	6.5%

Nevada	18,293	21,839	3,546	19.4%
New Hampshire	14,341	15,365	1,024	7.1%
New Jersey	99,061	110,202	11,141	11.2%
New Mexico	21,042	22,437	1,395	6.6%
New York	206,961	211,606	4,645	2.2%
North Carolina	83,680	98,357	14,677	17.5%
North Dakota	8,141	8,417	276	3.4%
Ohio	118,361	109,282	-9,079	-7.7%
Oklahoma	41,318	41,278	-40	-0.1%
Oregon	28,094	28,109	15	0.1%
Pennsylvania	116,963	129,911	12,948	11.1%
Rhode Island	10,645	11,212	567	5.3%
South Carolina	45,380	45,210	-170	-0.4%
South Dakota	9,396	9,512	116	1.2%
Tennessee	57,164	66,558	9,394	16.4%
Texas	274,826	334,997	60,171	21.9%
Utah	22,008	25,677	3,669	16.7%
Vermont	8,414	8,382	-32	-0.4%
Virginia	86,977	70,947	-16,030	-18.4%
Washington	51,098	53,934	2,836	5.6%
West Virginia	20,930	20,338	-592	-2.8%
Wisconsin	60,165	57,625	-2,540	-4.2%
Wyoming	6,783	7,127	344	5.1%

Appendix 3.I
Student to Teacher Ratios
(Source: Education Commission of the States calculations based on data from The U.S. Department of Education's National Center for Education Statistics)

	2000-2001	2010-2011	Change from 2000-2001 to 2010-2011	
			Ratios	Percentages
United States	**16.0**	**16.0**	**0.0%**	**0.0%**
New England States	**14.0**	**13.2**	**-0.8**	**-5.4%**
Comparative States	**14.2**	**13.8**	**-0.4**	**-2.6%**
Alabama	15.4	15.3	-0.1	-0.6%
Alaska	16.9	16.2	-0.7	-4.3%
Arizona	19.8	21.4	1.6	8.2%
Arkansas	14.1	16.2	2.1	14.7%
California	20.6	24.1	3.5	17.1%
Colorado	17.3	17.4	0.1	0.4%
Connecticut	13.7	13.1	-0.6	-4.7%
Delaware	15.4	14.5	-0.9	-5.9%
District of Columbia	13.9	12.0	-1.9	-13.5%
Florida	18.4	15.1	-3.4	-18.2%
Georgia	15.9	14.9	-1.0	-6.2%
Hawaii	16.9	15.8	-1.1	-6.7%
Idaho	17.9	17.6	-0.3	-1.7%
Illinois	16.1	15.7	-0.4	-2.3%
Indiana	16.7	18.0	1.3	7.9%
Iowa	14.3	14.3	0.0	0.0%
Kansas	14.4	14.0	-0.4	-3.1%
Kentucky	16.8	16.0	-0.8	-4.7%
Louisiana	14.9	14.3	-0.6	-3.9%
Maine	12.5	12.3	-0.2	-1.7%
Maryland	16.3	14.6	-1.7	-10.5%
Massachusetts	14.5	13.9	-0.6	-4.1%
Michigan	17.7	17.9	0.2	1.2%
Minnesota	16.0	15.9	-0.1	-0.6%
Mississippi	16.1	15.2	-0.9	-5.5%
Missouri	14.1	13.8	-0.3	-2.3%
Montana	14.9	13.7	-1.2	-8.2%

Nebraska	13.6	13.4	-0.2	-1.8%
Nevada	18.6	20.0	1.4	7.6%
New Hampshire	14.5	12.7	-1.8	-12.6%
New Jersey	13.3	12.7	-0.6	-4.3%
New Mexico	15.2	15.1	-0.1	-0.9%
New York	13.9	12.9	-1.0	-7.1%
North Carolina	15.5	15.2	-0.4	-2.3%
North Dakota	13.4	11.4	-2.0	-14.6%
Ohio	15.5	16.1	0.6	3.5%
Oklahoma	15.1	16.0	0.9	5.9%
Oregon	19.4	20.3	0.9	4.6%
Pennsylvania	15.5	13.8	-1.7	-11.0%
Rhode Island	14.8	12.8	-2.0	-13.3%
South Carolina	14.9	16.1	1.2	7.7%
South Dakota	13.7	13.3	-0.4	-3.2%
Tennessee	15.9	14.8	-1.1	-6.7%
Texas	14.8	14.7	-0.1	-0.5%
Utah	21.9	22.8	0.9	4.1%
Vermont	12.1	11.6	-0.5	-4.5%
Virginia	13.2	17.6	4.4	33.6%
Washington	19.7	19.4	-0.3	-1.8%
West Virginia	13.7	13.9	0.2	1.5%
Wisconsin	14.6	15.1	0.5	3.7%
Wyoming	13.3	12.5	-0.8	-6.1%

Appendix 3.J
School/District K-12 Administrators
(Source: U.S. Department of Education's National Center for Education Statistics)

	2000-2001	2010-2011	Change from 1999-2000 to 2010-2011	
			Total FTE	Percentages
United States	**141,792**	**165,045**	**23,253**	**16.4%**
New England States	**7,349**	**8,831**	**1,482**	**20.2%**
Comparative States	**11,997**	**13,018**	**1,021**	**8.5%**
Alabama	3,294	2,606	-688	-20.9%
Alaska	739	683	-56	-7.6%
Arizona	2,008	2,471	463	23.1%
Arkansas	1,617	1,767	150	9.3%
California	13,009	15,267	2,258	17.4%
Colorado	2,200	2,777	577	26.2%
Connecticut	2,063	2,127	64	3.1%
Delaware	349	413	64	18.3%
District of Columbia	267	491	224	83.9%
Florida	6,332	7,957	1,625	25.7%
Georgia	4,573	6,157	1,584	34.6%
Hawaii	475	571	96	20.2%
Idaho	715	701	-14	-2.0%
Illinois	5,812	7,362	1,550	26.7%
Indiana	2,946	2,903	-43	-1.5%
Iowa	2,119	1,740	-379	-17.9%
Kansas	1,755	1,807	52	3.0%
Kentucky	1,856	3,147	1,291	69.6%
Louisiana	2,611	2,880	269	10.3%
Maine	902	876	-26	-2.9%
Maryland	3,058	3,635	577	18.9%
Massachusetts	3,083	4,382	1,299	42.1%
Michigan	5,394	4,751	-643	-11.9%
Minnesota	1,871	2,103	232	12.4%
Mississippi	1,686	1,912	226	13.4%
Missouri	2,967	3,136	169	5.7%
Montana	502	534	32	6.4%
Nebraska	972	1,029	57	5.9%

Nevada	908	993	85	9.4%
New Hampshire	542	506	-36	-6.6%
New Jersey	4,603	4,651	48	1.0%
New Mexico	984	1,309	325	33.0%
New York	7,668	9,282	1,614	21.0%
North Carolina	4,551	5,101	550	12.1%
North Dakota	406	447	41	10.1%
Ohio	5,112	5,053	-59	-1.2%
Oklahoma	2,023	2,147	124	6.1%
Oregon	1,631	1,584	-47	-2.9%
Pennsylvania	4,392	5,531	1,139	25.9%
Rhode Island	338	452	114	33.7%
South Carolina	2,862	2,554	-308	-10.8%
South Dakota	426	430	4	0.9%
Tennessee	4,696	3,360	-1,336	-28.4%
Texas	13,550	22,360	8,810	65.0%
Utah	956	1,300	344	36.0%
Vermont	421	488	67	15.9%
Virginia	3,910	4,606	696	17.8%
Washington	2,692	2,800	108	4.0%
West Virginia	1,077	1,105	28	2.6%
Wisconsin	2,529	2,447	-82	-3.2%
Wyoming	340	354	14	4.1%

Appendix 3.K
Student to Administrator Ratios
(Source: Education Commission of the States calculations based on data from the U.S. Department of Education's National Center for Education Statistics)

	2000-2001	2010-2011	Change from 2000-2001 to 2010-2011	
			Ratios	Percentages
United States	**332.9**	**299.8**	**-33.1**	**-9.9%**
New England States	**301.0**	**242.4**	**-58.6**	**-19.5%**
Comparative States	**299.0**	**269.5**	**-29.5**	**-9.9%**
Alabama	224.6	289.9	65.3	29.1%
Alaska	180.5	193.4	13.0	7.2%
Arizona	437.1	433.7	-3.4	-0.8%
Arkansas	278.3	272.8	-5.4	-1.9%
California	472.0	412.0	-60.1	-12.7%
Colorado	329.3	303.7	-25.6	-7.8%
Connecticut	272.5	263.5	-9.0	-3.3%
Delaware	328.6	313.3	-15.3	-4.6%
District of Columbia	258.1	145.2	-113.0	-43.8%
Florida	384.5	332.2	-52.3	-13.6%
Georgia	316.0	272.4	-43.6	-13.8%
Hawaii	388.1	314.5	-73.6	-19.0%
Idaho	342.8	393.5	50.7	14.8%
Illinois	352.5	284.1	-68.4	-19.4%
Indiana	335.8	360.7	24.9	7.4%
Iowa	233.6	284.9	51.3	22.0%
Kansas	268.2	267.7	-0.5	-0.2%
Kentucky	358.8	213.9	-144.9	-40.4%
Louisiana	284.6	241.9	-42.7	-15.0%
Maine	229.5	215.8	-13.7	-6.0%
Maryland	278.9	234.4	-44.5	-15.9%
Massachusetts	316.3	218.1	-98.2	-31.1%
Michigan	319.0	334.0	15.1	4.7%
Minnesota	456.6	398.5	-58.1	-12.7%
Mississippi	295.3	256.6	-38.7	-13.1%
Missouri	307.6	293.0	-14.7	-4.8%

Montana	308.5	265.3	-43.2	-14.0%
Nebraska	294.4	290.1	-4.4	-1.5%
Nevada	375.2	440.2	65.0	17.3%
New Hampshire	384.6	384.8	0.2	0.0%
New Jersey	285.3	301.6	16.2	5.7%
New Mexico	325.5	258.3	-67.2	-20.6%
New York	375.9	294.7	-81.2	-21.6%
North Carolina	284.3	292.2	8.0	2.8%
North Dakota	269.0	215.5	-53.5	-19.9%
Ohio	359.0	347.2	-11.8	-3.3%
Oklahoma	308.0	307.4	-0.6	-0.2%
Oregon	334.9	360.3	25.4	7.6%
Pennsylvania	413.1	324.2	-88.9	-21.5%
Rhode Island	465.5	318.1	-147.4	-31.7%
South Carolina	236.7	284.2	47.5	20.1%
South Dakota	301.9	293.3	-8.6	-2.8%
Tennessee	193.6	293.9	100.3	51.8%
Texas	299.6	220.7	-78.9	-26.3%
Utah	503.6	450.4	-53.2	-10.6%
Vermont	242.4	198.5	-43.9	-18.1%
Virginia	292.8	271.7	-21.1	-7.2%
Washington	373.2	372.8	-0.5	-0.1%
West Virginia	265.9	256.0	-9.9	-3.7%
Wisconsin	347.8	356.5	8.7	2.5%
Wyoming	264.5	251.4	-13.1	-4.9%

Appendix 3.L
Federal Spending as a Percentage of K-12 Education Spending
(Source: United States Census Bureau)

	1999-2000	2009-2010
United States	7.1%	12.5%
Alabama	8.7%	15.6%
Alaska	15.2%	16.5%
Arizona	9.8%	18.1%
Arkansas	9.0%	15.6%
California	8.9%	15.0%
Colorado	5.3%	8.2%
Connecticut	4.0%	8.6%
Delaware	6.5%	10.7%
District of Columbia	21.0%	6.7%
Florida	8.0%	16.0%
Georgia	6.3%	14.6%
Hawaii	9.0%	14.9%
Idaho	7.6%	20.4%
Illinois	7.5%	13.8%
Indiana	5.1%	10.8%
Iowa	5.9%	13.2%
Kansas	6.3%	12.4%
Kentucky	9.9%	15.4%
Louisiana	11.6%	19.3%
Maine	6.1%	12.0%
Maryland	5.5%	7.5%
Massachusetts	5.1%	7.4%
Michigan	6.7%	12.9%
Minnesota	4.6%	12.2%
Mississippi	13.5%	21.2%
Missouri	6.6%	15.0%
Montana	11.9%	15.9%
Nebraska	6.9%	12.8%
Nevada	4.9%	8.4%
New Hampshire	3.6%	6.6%
New Jersey	3.8%	9.3%
New Mexico	13.5%	20.7%
New York	6.1%	6.7%
North Carolina	6.9%	11.6%
North Dakota	12.5%	22.0%

Ohio	5.6%	10.2%
Oklahoma	9.7%	13.3%
Oregon	6.2%	13.2%
Pennsylvania	6.3%	11.3%
Rhode Island	5.6%	11.3%
South Carolina	7.8%	13.7%
South Dakota	12.3%	19.4%
Tennessee	8.7%	13.1%
Texas	8.3%	15.8%
Utah	7.4%	13.4%
Vermont	6.9%	11.0%
Virginia	5.6%	10.4%
Washington	7.2%	11.8%
West Virginia	9.4%	16.2%
Wisconsin	4.6%	10.1%
Wyoming	8.4%	7.2%

Appendix 3.M
High School Graduation Rates
Graduation Rates Based on Four Years of Attendance
(Source: National Center for Education Statistics)

	2001-2002	2008-2009	Change in Rates
United States	72.6%	75.5%	2.9%
Alabama	62.1%	69.9%	7.8%
Alaska	65.9%	72.6%	6.7%
Arizona	74.7%	72.5%	---2.2%
Arkansas	74.8%	74.0%	---0.8%
California	72.7%	71.0%	---1.7%
Colorado	74.7%	77.6%	2.9%
Connecticut	79.7%	75.4%	---4.3%
Delaware	69.5%	73.7%	4.2%
Florida	63.4%	68.9%	5.5%
Georgia	61.1%	67.8%	6.7%
Hawaii	72.1%	75.3%	3.2%
Idaho	79.3%	80.6%	1.3%
Illinois	77.1%	77.7%	0.6%
Indiana	73.1%	75.2%	2.1%
Iowa	84.1%	85.7%	1.6%
Kansas	77.1%	80.2%	3.1%
Kentucky	69.8%	77.6%	7.8%
Louisiana	64.4%	67.3%	2.9%
Maine	75.6%	79.9%	4.3%
Maryland	79.7%	80.1%	0.4%
Massachusetts	77.6%	83.3%	5.7%
Michigan	72.9%	75.3%	2.4%
Minnesota	83.9%	87.4%	3.5%
Mississippi	61.2%	62.0%	0.8%
Missouri	76.8%	83.1%	6.3%
Montana	79.8%	82.0%	2.2%
Nebraska	83.9%	82.9%	---1.0%
Nevada	71.9%	56.3%	---15.6%
New Hampshire	77.8%	84.3%	6.5%
New Jersey	85.8%	85.3%	---0.5%
New Mexico	67.4%	64.8%	---2.6%
New York	60.5%	73.5%	13.0%
North Carolina	68.2%	75.1%	6.9%
North Dakota	85.0%	87.4%	2.4%

Ohio	77.5%	79.6%	2.1%
Oklahoma	76.0%	77.3%	1.3%
Oregon	71.0%	76.5%	5.5%
Pennsylvania	80.2%	80.5%	0.3%
Rhode Island	75.7%	75.3%	---0.4%
South Carolina	57.9%	66.0%	8.1%
South Dakota	79.0%	81.7%	2.7%
Tennessee	59.6%	77.4%	17.8%
Texas	73.5%	75.4%	1.9%
Utah	80.5%	79.4%	---1.1%
Vermont	82.0%	89.6%	7.6%
Virginia	76.7%	78.4%	1.7%
Washington	72.2%	73.7%	1.5%
West Virginia	74.2%	77.0%	2.8%
Wisconsin	84.8%	90.7%	5.9%
Wyoming	74.4%	75.2%	0.8%

Appendix 3.N
College Going Rates
Percentage of Student Attending College One Year After Graduation
(Source: Calculated by the CL Higher Education Center
Based on Data from the U.S. Department of Education)

	2007-2008
United States	**63.3%**
Alabama	66.7%
Alaska	45.7%
Arizona	51.4%
Arkansas	62.5%
California	65.4%
Colorado	62.6%
Connecticut	68.0%
Delaware	66.1%
District of Columbia	53.5%
Florida	58.8%
Georgia	69.6%
Hawaii	62.3%
Idaho	49.1%
Illinois	57.4%
Indiana	65.7%
Iowa	64.3%
Kansas	65.4%
Kentucky	60.9%
Louisiana	65.3%
Maine	57.1%
Maryland	62.9%
Massachusetts	74.7%
Michigan	59.9%
Minnesota	69.2%
Mississippi	77.4%
Missouri	60.0%
Montana	51.9%
Nebraska	65.5%
Nevada	55.6%
New Hampshire	63.9%
New Jersey	71.1%
New Mexico	67.7%
New York	74.2%

North Carolina	66.0%
North Dakota	67.6%
Ohio	62.7%
Oklahoma	56.0%
Oregon	46.5%
Pennsylvania	63.9%
Rhode Island	67.4%
South Carolina	70.4%
South Dakota	72.1%
Tennessee	61.6%
Texas	56.9%
Utah	58.5%
Vermont	48.3%
Virginia	68.7%
Washington	50.7%
West Virginia	59.1%
Wisconsin	59.1%
Wyoming	59.4%

Appendix 4.A: Equity Statistics: Maine Unweighted Students and EPS Revenues

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	$5,336	$5,939	$6,472	$6,603	$6,862	$7,075	$7,211	$7,310
Standard Deviation	$330	$361	$378	$412	$381	$444	$456	$382
Coefficient of Variation	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05
Range	$2,853	$3,085	$4,691	$5,663	$3,447	$3,734	$5,880	$7,089
Restricted Range	$1,041	$1,135	$1,224	$1,343	$1,446	$1,409	$1,650	$1,160
Federal Range Ratio	0.22	0.21	0.21	0.23	0.24	0.22	0.26	0.17
McLoone Index	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96
Verstegen Index	1.05	1.04	1.04	1.05	1.05	1.05	1.05	1.04
Correlation EPS	0.297	0.307	0.304	0.275	0.224	0.252	0.226	0.21
Elasticity EPS	0.025	0.024	0.021	0.019	0.014	0.018	0.016	0.011
Correlation Income (Income per return)							0.421	
Elasticity Income (per return)							0.108	

Appendix 4.B: Equity Statistics: Maine Unweighted Students and EPS Revenues Including SPED, GT, and LEP

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	$6,583	$7,249	$7,878	$8,019	$8,383	$8,631	$8,831	$9,040
Standard Deviation	$537	$548	$600	$585	$661	$658	$673	$650
Coefficient of Variation	0.08	0.08	0.08	0.07	0.08	0.08	0.08	0.07
Range	$7,192	$4,803	$9,285	$8,790	$6,334	$8,925	$8,156	$7,089
Restricted Range	$1,802	$1,836	$2,072	$1,838	$2,186	$2,274	$2,148	$2,089
Federal Range Ratio	0.31	0.29	0.3	0.26	0.3	0.3	0.27	0.26
McLoone Index	0.94	0.95	0.94	0.95	0.95	0.95	0.94	0.95
Verstegen Index	1.07	1.06	1.06	1.06	1.07	1.07	1.06	1.06
Correlation EPS	0.283	0.293	0.298	0.293	0.26	0.275	0.215	0.203
Elasticity EPS	0.031	0.029	0.027	0.024	0.024	0.024	0.018	0.015
Correlation Income (Income per return)							0.223	
Elasticity Income (per return)							0.068	

Appendix 4.C: Equity Statistics: Maine Unweighted Students and State and Required Local Revenues

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	N/A	N/A	$8,805	$8,944	$9,421	$9,692	$9,998	$10,174
Standard Deviation	N/A	N/A	$763	$779	$845	$873	$991	$930
Coefficient of Variation	N/A	N/A	0.09	0.09	0.09	0.09	0.1	0.09
Range	N/A	N/A	$8,329	$12,564	$20,037	$16,126	$29,780	$18,618
Restricted Range	N/A	N/A	$2,383	$2,342	$2,437	$2,332	$2,763	$2,847
Federal Range Ratio	N/A	N/A	0.31	0.3	0.3	0.28	0.33	0.32
McLoone Index	N/A	N/A	0.94	0.94	0.94	0.94	0.93	0.93
Verstegen Index	N/A	N/A	1.07	1.07	1.07	1.08	1.07	1.08
Correlation EPS	N/A	N/A	0.31	0.3	0.274	0.296	0.31	0.221
Elasticity EPS	N/A	N/A	0.034	0.029	0.026	0.031	0.034	0.021
Correlation Income (Income per return)	N/A	N/A					0.145	
Elasticity Income (per return)	N/A	N/A					0.053	

Appendix 4.D Equity Statistics: Maine Unweighted Students and State and Raised Local Revenues

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	$8,724	$9,424	$9,909	$10,274	$10,498	$10,642	$10,704	$11,128
Standard Deviation	$1,161	$1,337	$1,413	$1,444	$1,385	$1,447	$1,486	$1,694
Coefficient of Variation	0.13	0.14	0.14	0.14	0.13	0.14	0.14	0.15
Range	$22,574	$19,126	$38,367	$44,605	$38,910	$42,834	$48,900	$50,742
Restricted Range	$3,124	$3,771	$3,824	$3,988	$4,146	$3,903	$3,949	$4,161
Federal Range Ratio	0.44	0.48	0.47	0.47	0.49	0.44	0.45	0.46
McLoone Index	0.94	0.93	0.91	0.92	0.93	0.92	0.92	0.91
Verstegen Index	1.14	1.14	1.12	1.13	1.13	1.13	1.12	1.14
Correlation EPS	0.608	0.6	0.532	0.59	0.563	0.562	0.595	0.486
Elasticity EPS	0.11	0.104	0.091	0.092	0.086	0.088	0.091	0.076
Correlation Income (Income per return)							0.323	
Elasticity Income (per return)							0.174	

Appendix 4.E Equity Statistics: Maine Weighted Students and EPS Revenue Including SPED, GT, and LEP

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	$5,196	$5,802	$6,276	$6,419	$6,665	$6,840	$6,989	$7,136
Standard Deviation	$438	$436	$478	$480	$512	$538	$529	$503
Coefficient of Variation	0.08	0.08	0.08	0.07	0.08	0.08	0.08	0.07
Range	$4,987	$4,468	$4,923	$5,542	$3,474	$14,146	$6,152	$7,799
Restricted Range	$1,417	$1,511	$1,685	$1,661	$1,689	$1,668	$1,652	$1,622
Federal Range Ratio	0.32	0.3	0.31	0.3	0.29	0.28	0.27	0.26
McLoone Index	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.95
Verstegen Index	1.07	1.06	1.05	1.06	1.06	1.06	1.06	1.06
Correlation EPS	0.378	0.391	0.387	0.378	0.364	0.382	0.325	0.321
Elasticity EPS	0.042	0.037	0.035	0.03	0.031	0.034	0.027	0.022

Appendix 4.F: Equity Statistics: Maine Weighted Students and State and Required Local Revenues

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	N/A	N/A	$7,015	$7,160	$7,490	$7,681	$7,913	$8,031
Standard Deviation	N/A	N/A	$656	$649	$649	$705	$803	$762
Coefficient of Variation	N/A	N/A	0.09	0.09	0.09	0.09	0.1	0.09
Range	N/A	N/A	$9,747	$13,350	$20,764	$22,114	$3,787	$4,226
Restricted Range	N/A	N/A	$2,142	$2,139	$2,143	$2,301	$2,350	$2,392
Federal Range Ratio	N/A	N/A	0.36	0.35	0.33	0.35	0.36	0.35
McLoone Index	N/A	N/A	0.93	0.94	0.94	0.93	0.93	0.93
Verstegen Index	N/A	N/A	1.07	1.07	1.06	1.06	1.08	1.08
Correlation EPS	N/A	N/A	0.243	0.229	0.173	0.208	0.235	0.139
Elasticity EPS	N/A	N/A	0.025	0.022	0.018	0.022	0.026	0.013

Appendix 4.G: Equity Statistics: Maine Weighted Students and State and Raised Local Revenues

	FY 2006	FY 2007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012	FY 2013
Mean Per Pupil Expenditures	$6,886	$7,542	$7,895	$8,225	$8,346	$8,433	$8,472	$8,784
Standard Deviation	$999	$1,115	$1,197	$1,218	$1,133	$1,224	$1,261	$1,433
Coefficient of Variation	0.15	0.15	0.15	0.15	0.14	0.15	0.15	0.16
Range	$22,574	$18,327	$38,410	$44,605	$33,825	$37,320	$42,515	$50,742
Restricted Range	$3,152	$3,298	$3,375	$3,537	$3,491	$3,863	$3,792	$4,312
Federal Range Ratio	0.56	0.53	0.53	0.53	0.53	0.57	0.55	0.62
McLoone Index	0.91	0.92	0.91	0.91	0.92	0.91	0.91	0.89
Verstegen Index	1.13	1.13	1.12	1.12	1.12	1.12	1.13	1.13
Correlation EPS	0.627	0.628	0.56	0.607	0.604	0.585	0.618	0.502
Elasticity EPS	0.12	0.112	0.1	0.097	0.092	0.096	0.099	0.08

Notes: 2007 does not include Dennistown or West Point, for which the DOE lacks raised local data

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.6 Offeror Technical Response to RFP Requirements and Proposed Work Plan

4.4.3.6 Offeror Technical Response to RFP Requirements and Proposed Work Plan

This technical response to the RFP is organized in the following manner. The Introduction serves to introduce our project team, provide some context to the adequacy funding experience in Maryland, and summarize our approach to each of the studies called for in the RFP. This is followed by the core of our technical response – detailed descriptions of our methodological approach, data collection and reporting of findings for each of the required studies. This section begins with what we call the Preliminary Studies. These studies will help to set the stage for many of the core studies required for this project. Preliminary studies include the review of adequacy studies (3.2.1.10) and a series of case studies and literature reviews that we will use to generate data and information to support a number of other analyses, such as the adequacy approaches, school size study, and studies of serving concentrations of students in poverty or with special needs. The Preliminary Studies are followed by a description of our approach to determining an adequate base cost and adjustments for special needs students for the state of Maryland (3.2.1), the school size study (3.2.2), and the other studies requested in Section 3.2.3 of the RFP.

Following the description of our methodological approaches, we provide a description of our management plan (4.4.3.6.b), the location of our services for this project and a Problem Escalation Procedure (4.4.3.6.c & d).

Introduction

Augenblick, Palaich and Associates, Inc. (APA) understands that the state of Maryland wishes to conduct a costing out study to determine the level of equity in its current school funding system, and the level of funding necessary to enable schools, districts and students to meet state and federal education performance goals. In addition to these two central questions, the State in its request for proposals (RFP) asked for studies in several additional related areas. APA conducted a similar study for the Commission on Education Finance, Equity and Excellence, known as the Thornton Commission, in Maryland in 2001.

The work that will be undertaken is technical in nature and requires extensive experience with processes and systems:

- The way state school finance systems operate;
- In-depth knowledge of the components of such systems and the differences in how they work in the states;
- The definition and measurement of school finance equity using generally accepted statistical procedures;
- The ability to calculate the cost of providing adequate education services so that students can meet state academic performance objectives using the generally accepted methods for making such calculations; and
- The ability to build a school finance formula and simulate its impact on all school districts.

To appropriately respond to the studies requested in the RFP, APA has assembled one of the strongest project teams ever to conduct such a comprehensive set of school finance analyses. The project team is pleased to submit this proposal to study the adequacy of education funding in Maryland. We offer this proposal with no exceptions to the requirements stated in the RFP or potential contract.

Background

Augenblick, Palaich and Associates

Incorporated in 1983, Augenblick, Palaich and Associates, Inc. (APA) is a privately-owned, Denver-based consulting firm that specializes in providing technical assistance to state-level policymakers on early childhood to postsecondary finance issues. APA senior staff combined has almost a century of experience working on school finance-related issues with legislators, testifying before legislative bodies, and working with governors, state education agencies, and other education and community leaders. This experience combined with our academic and professional training gives our firm a unique capacity to translate complex data and analyses into information that is useful to policymakers and to work cooperatively to meet the needs of leaders and lawmakers on all sides of the issues. APA conducted the analysis for the Maryland Thornton Commission in 2000-2001.

Picus Odden and Associates

Picus Odden and Associates (POA) is an independent school finance consulting group whose mission is to work with states and school districts to improve the way public resources for education are translated into improved student learning. Led by managing partner Lawrence O. Picus and principal partner Allan Odden, POA works collaboratively with clients to address state specific school funding issues. Drawing on over seventy years of experience in school finance, Picus Odden and Associates is uniquely qualified to conduct the work described in this proposal.

Together, APA and POA have combined to undertake and complete the vast majority of adequacy studies conducted across the country over the last 25 years. In most of the cases where we have undertaken an adequacy study the state has also requested an equity study. Even more telling in terms of the response to this RFP, APA and POA have assisted virtually every state in the country by either reviewing a state's funding formula or building its funding system based on the results of the types of analyses requested in this RFP.

Maryland Equity Project at the University of Maryland

The Maryland Equity Project (MEP) is an independent, non-partisan research and policy center located in the College of Education at the University of Maryland. The MEP seeks to improve education through research and policy analysis that supports an informed policy debate on the quality and distribution of educational opportunities in Maryland, from early childhood to postsecondary education. MEP draws on faculty and staff expertise, as well as the substantial resources of the University of Maryland, to engage state and local policymakers and educators and increase the impact of research on education policy in Maryland.

History of Adequacy Studies in Maryland

In 1999, Maryland created the Commission on Education Finance, Equity and Excellence to study and make recommendations on how to ensure adequate school funding, reduce inequities across districts and improve educational performance statewide. The Commission requested two costing out studies, one of which was performed by Augenblick & Myers (now Augenblick, Palaich and Associates). The final recommendations of the Commission (which became known as the Thornton Commission) issued in a 2002 report, relied heavily on the Augenblick & Myers study. The recommendations included an increase in state education aid of $1.8 billion by 2007, thereby increasing state per pupil aid from $3,500 in 2002 to $5,600 in 2007 (Commission on Education Finance, Equity and Excellence, 2002). In addition to the increased funding, the report also recommended increased accountability measures, wealth equalization across districts, local district maintenance of existing funding, and a gradual phase-in of the new funding system over the course of six years.

Several months later, the Maryland General Assembly passed the Bridge to Excellence in Public Schools Act to implement the Commission's recommendations. The Act was largely funded by a 34 cent increase on the state's cigarette tax. As part of the Act, the Maryland General Assembly mandated a three-year assessment of particular student outcomes, and commissioned MGT of America to conduct this assessment. MGT's final report was issued at the end of 2008.

The MGT report found that in the six years since implementation of the Bridge to Excellence Act, state education aid had increased $2.029 billion or an increase of $2,438 (82.8%) per student and local appropriations had increased $1.317 billion or an increase of $1,621 (36.2%) per student (MGT of America, Inc., 2008).

The MGT study further found that district and school leaders were overwhelmingly positive about the Act's requirements and the potential benefits (MGT of America, Inc., 2008). Districts spent most of the additional resources on "improvements and enhancements to educational programs and the educational process, including increases to salaries and benefits" to remain competitive in hiring and to retain high quality teachers.

During the period under study, school districts in Maryland substantially improved the percentages of elementary and middle school students demonstrating proficiency in reading and math. Statewide, the gaps to meet No Child Left Behind standards decreased 51% in reading and 49% in math at the elementary level and 36% in reading and 39% in math at the middle school level (MGT of America, Inc., 2008). Proficiency levels improved across all race and ethnic groups at the elementary and middle school levels. For every $1,000 of additional per student expenditure since the Act was passed, the reading and math proficiency gaps decreased by 4% in elementary school and 8% at the middle school levels (MGT of America, Inc., 2008).

The evaluation also found that proficiency levels improved faster in schools where higher percentages of classes were taught by highly qualified teachers. Other factors that contributed to improved student performance were strong school leadership, planning meetings, use of student-level data, discussion of instructional practices in team meetings, reading and math teacher specialists, and targeted, embedded professional development.

The Studies

The studies described in this proposal fall into four categories: (1) the preliminary studies; (2) the adequacy study; (3) the school size study; and (4) the other Maryland requested studies. Following is a brief overview of each of these categories.

The Preliminary Studies

These preliminary studies set the foundation for the project. Three studies fall into this category. The first is a review of recent adequacy studies specified in the RFP. Over the past 15 years, an estimated 100 school finance adequacy studies have been conducted for various states, using the four approaches for estimating adequacy – evidence-based, successful schools, professional judgment panels, and cost function. Some states seek adequacy recommendations from all four methods, others select a specific method, and some specify at least two methods be used as required in this RFP. We will focus our review on adequacy studies conducted over the past ten years, as these will provide a

comprehensive picture of the current adequacy landscape and will reflect the refinements made in their methodology in recent years.

The second preliminary study is a set of case studies of the following four school types: 1) high performing; 2) rapidly improving; 3) closing the achievement gap; and 4) high performing and high student need. Data collected from these schools will inform all aspects of the adequacy study, the school size study and several of the other requested studies. The case studies will be used to guide our selection of schools for the successful schools component of the adequacy study and the cost model used in the evidence-based approach. The detailed programmatic and cost information collected through these case studies will not only inform our cost estimates, but will also provide state policymakers with information about specific effective approaches currently being used by successful Maryland schools.

The third and final of the preliminary studies is a set of literature reviews that will contribute to the adequacy study, the school size study, the evaluation of prekindergarten services, the review of the proxy for identifying economically disadvantaged students study, and the study of the impact of increasing and declining enrollments on local school systems. We will use the literature reviews to inform our analyses, provide the latest thinking from relevant research and provide insights on successful approaches used in other states and schools. Our literature review methodology will include a comprehensive search strategy and rigorous evaluation of the quality of the studies.

The Adequacy Study

In the past two decades, states and researchers have developed several approaches to determining a base cost figure designed to reflect either a particular set of services, a particular level of student performance, or both, so that the base cost has a meaning beyond simply reflecting available revenue. These approaches were developed because no valid research yet exists to document a straightforward statistical relationship between how much is spent on education resources and a corresponding level of student performance. If such a relationship existed, then state policymakers could simply determine the level of performance they wanted and then dial up the appropriate amount of revenue.

In the absence of such a simple relationship, four approaches have emerged for determining a base cost level: (1) the evidence-based approach; (2) the successful schools approach; (3) the professional judgment approach; and (4) the cost function approach. These approaches differ in terms of underlying philosophy, the assumptions that need to be made to apply them, and the data required. Each approach is briefly summarized below. The project team proposes to make use of three of these approaches – successful schools, professional judgment and evidence-based – in its study of adequacy in Maryland.

The Evidenced-based Approach

The evidenced-based approach assumes that information gathered from research exists to define the resource needs of a hypothetical school or school district to assure that it can meet state standards. This approach was used in New Jersey to determine the resource needs of a subset of school districts, commonly referred to as "Abbott" districts. The court identified these districts as requiring special attention and resources. The approach not only determined resource levels, but also specified the programmatic ways such resources should be used. The strength of the approach is that it incorporates the latest research about the way resources should be used to positively impact student achievement. However, there are disadvantages including questions about whether research applies to all demographic situations, the lack of research information about many cost elements schools face and the fact that the approach may not be state specific. In recent years, the approach has made use of local professional judgment panels and case studies of high performing schools to tailor the evidence-based model to specific state contexts.

The Successful Schools Approach

The successful schools approach is based on the simple premise that any district should be able to be as successful at meeting a set of objectives as those districts that actually meet those objectives. This approach also assumes every district should have the same level of funding that has been available to the successful districts along with additional funding provided to meet the cost of serving students with special needs and districts with special circumstances. This approach is mostly done at the district level. However, to meet the needs of Maryland, where there are relatively few school districts, this approach will be applied to the school level.

The successful schools approach is most useful when the state has specified its student outcomes and input objectives, and schools that have met them can be identified. The characteristics of the approach are the following: it is based on current practices to meet the standards; it is empirical and tangible, based on the spending of districts that are meeting the standard; it assumes that resources can be used in very different ways in various successful districts; it focuses on the cost of providing services to students with no special needs in districts with no special circumstances; and it only generates a base cost figure. Adjustments must be made for students with special needs and districts with special circumstances.

The Professional Judgment Approach

The professional judgment approach relies on the views of experienced service providers to specify the kinds of resources and the quantities of those resources that would be necessary to achieve a set of identified objectives. This input-based approach was developed in Wyoming to calculate a base cost amount in response to the state Supreme Court's requirement that the school finance system reflect the cost of the "basket of quality

educational goods and services" needed to assure that a high school graduate could be admitted to an institution of higher education in the state (Campbell County School District v. State, 1995). The approach uses panels of experts to specify the types of education services needed in order to meet state standards. Once the services have been specified (with a focus on numbers of personnel, regular school programs, extended-day and extended-year programs, numbers of different types of personnel, professional development and technology), costs are attached and a per pupil cost is determined. This approach best reflects the experiences of people who are actually responsible for delivering education services, which may be combined with research results, as a rational way to specify the resources required to produce a specific level of student performance.

Regardless of how the approach has been implemented, it has been designed to distribute funds through a block grant – that is, without specifying exactly how money should be spent despite the fact that the prototype schools designate what the expert panels believe is the best combination of resources. The advantages of the approach are that it reflects the views of actual service providers and it is easy to understand. The disadvantages are that it tends to be based on current practice, and there may not be evidence beyond individual experience that the provision of money at the designated level, or even the deployment of resources as specified by the prototype models, will produce the anticipated outcomes.

The Cost Function Approach

The cost function approach is based on understanding the factors that statistically explain differences in spending across school districts while controlling for student performance. This approach has proven difficult to explain in situations other than academic forums, and is not as easy to understand as the other approaches. The approach requires the availability of a significant amount of data, much of which needs to be at the school or student level for the approach to be most useful. It also requires a large enough sample of districts to have valid results. A cost function study is not possible in Maryland because there are only 24 school districts in the state. Furthermore, no state has used the statistical approach alone to determine the parameters of a school finance formula. However, the cost function approach has been used to establish some of the adjustments states use to allocate funding sensitive to uncontrollable cost pressures, such as setting the weights for students enrolled in special education programs or creating the formulas to reflect the costs associated with different enrollment levels.

Summary of Adequacy Study Methods

The project team does not recommend making use of the cost function approach in Maryland due to the lack of detailed expenditure data at the school level and the small number of school districts in the state. Studies using the first three approaches are proposed in this response to Maryland's RFP. The studies are described in detail in the

sections below. Two of the three principals on our project team had roles in developing each of these approaches and have applied them in over twenty-five states.

The School Size Study

We have assembled a strong research team to undertake our school size study. Our team will make use of multiple data collection methods to collect current policies on school size enacted by the state's school districts, obtain information on best practices regarding school size and school size policies from around the country, assess the impact of zoning laws on school size, and gain an understanding of the impacts of school size on educational and extracurricular programs. We will also collect quantitative and geographical information systems data from local, state and national sources, to support our analyses of the state and local fiscal impact of smaller schools, the effects of school boundary and attendance area policies on school size, and explore existing opportunities for creating smaller schools.

The Other Maryland Requested Studies

Evaluate the impact of the Community Eligibility Provision on state aid formulas and examine alternative proxies to the number of students eligible for free and reduced price meal (FRPM) for identifying economically disadvantaged students. (3.2.3.1.)

This study will consist of two parts. First, we will assess the potential costs of the Community Eligibility Provision of the Healthy, Hunger-Free Kids Act, both the direct costs of implementing the Act and the its impact on the costs of program formulas driven by free and reduced price meal counts. Our analysis will be supported by an examination of the cost experience of states that have implemented the program since 2010. Second, we will explore alternative measures to the use of free and reduced price meal counts as a proxy for economic disadvantage. This study will involve a scan of measures used in other states and an extensive literature review of the research on this topic.

Evaluate current mandated and additional prekindergarten services provided by LEAs and private providers in the State, and evaluate current funding provided for prekindergarten services. (3.2.3.2.)

This study will assess the current state of prekindergarten services in Maryland, determine the costs and benefits of moving to universal access to quality programs, and use nationally recognized cost models for assessing alternative approaches to funding prekindergarten services for 3- and 4-year-old children.

Evaluate the equity of the State's education finance structure and current calculation of local wealth used by the State for education aid formulas. (3.2.3.3.)

This study will examine the equity of school funding across Maryland's 24 school districts using longitudinal district level revenue and expenditure data. The analysis will make use of generally accepted school finance statistics for both finance equity and fiscal neutrality.

The study will also examine trends in school finance over the time period and the impact of changes to the state's funding formula.

Evaluate the impact of increasing and declining enrollments on local school systems. (3.2.3.4.)

This study will evaluate enrollment trends in the state's school districts over time and their impact on key areas of school operations, such as staffing, transportation, facilities, and technology. A particular focus of our analysis will be of districts with small enrollments but large geographic area. This work will be informed by the school size study and will explore opportunities for school systems to improve efficiencies and for the state funding formula to mitigate the impact of significant enrollment change.

Evaluate the Supplemental Grants and make a recommendation as to whether they should continue to be funded. (3.2.3.5.)

In this study, the project team will evaluate the impact of the Supplemental Grants program on the equity and adequacy of the state's school finance system and on the local impact of the districts receiving the grants. It will examine both how these funds are being used and their effects on district budgets.

Evaluate the current methodology used to calculate the Maryland Geographic Cost of Education Index and provide any recommendations to change the methodology. (3.2.3.6.)

For this study, we will assess how the current Maryland Geographic Cost of Education Index compares to other approaches, such as the comparable wage index, assess the effect of applying the National Center for Education Statistics' wage index to Maryland's school districts, and develop a Maryland-specific comparable wage index using data from the Bureau of Labor Statistics.

Given the breadth of the studies required under the RFP we have developed a comprehensive data collection plan for both cross-sectional and longitudinal quantitative data and qualitative data at the state and local levels. Our data needs will be wide-ranging and we are mindful of burdens this can create for educators and state administrative staff. We will work with the Maryland State Department of Education, the Stakeholder Advisory Group and other stakeholders to minimize the data collection burden on educators and administrators.

The following sections provide more detailed descriptions of how our research approach will meet the needs of the State of Maryland as they are enumerated in the RFP. We have organized the studies into four categories: 1) Preliminary Studies, 2) Adequacy Studies, 3) School Size Study, and 4) Other Requested Studies.

Scope of Work Requirements

Addressing RFP Section 3.2

Below we more fully describe how we will implement each of the three adequacy approaches. This section briefly describes where and how each of the specific scope of work-requirements for the adequacy study will be addressed.

- 3.2.1.1. Conduct an adequacy study using at least two approaches – The project team will employ the three most widely used adequacy approaches. These are the evidence-based, successful schools and professional judgment approaches.
- 3.2.1.2. Base the study on funding required to implement the Maryland College and Career-Ready Standards – The focus of all three approaches will be to determine the resources necessary for students, schools, and districts to meet the Maryland College and Career-Ready Standards.
- 3.2.1.3. Identify a base level of funding – All three approaches provide the ability to identify base cost figures. Once all analyses are completed, the project team will use its years of state finance formula design experience and work with the Stakeholder Advisory Group to determine the appropriate base funding level for meeting the Maryland College and Career-Ready Standards.
- 3.2.1.4. Identify per pupil weights for students with special needs – The evidence-based and professional judgment approaches both explicitly examine the appropriate weights for special needs students. The case studies and literature review will also contribute to this work.
- 3.2.1.5. Analyze the effect of concentrations of poverty on the results – Both the evidence-based and professional judgment approaches will examine the issue of what, if any, additional adjustments are required to adequately serve students served in schools with high concentrations of poverty. The professional judgment approach allows Maryland educators to examine the differences in resource needs in schools based on different concentrations of poverty. Our case studies and literature reviews will also help to address this question.
- 3.2.1.6. Identify gaps in growth and achievement among student groups – The project team will analyze state and district level data to assess the types and magnitude of achievement gaps among student groups. The results of this analysis will help to guide our work using the three adequacy approaches in addressing the resource needs of different subgroups. The successful schools approach will include an examination of student performance at the school level, and research, through the case studies, will identify the specific strategies and programs being used to address these gaps.

- 3.2.1.7. Correlate deficits in student performance with deficits in funding – Traditional production function research thus far has found a weak correlation between funding and student achievement (Hanushek, 1986; 1989). However, more recent thinking suggests that, while the amount of resources going to schools is important, the capacity to make effective use of these resources may be just as necessary (Cohen, 2002; Grubb, 2009). This question will be addressed by all three adequacy approaches in part by comparing the resource needs identified by the adequacy studies to the actual resources available. More explicitly the successful schools study will examine spending levels for different groups of students within schools and compare these to performance levels in the schools. Our case studies will serve to answer the question: how are successful schools using resources differently to achieve their success? Adjustments will be made to account for student needs at the school level when examining performance and spending.
- 3.2.1.8. Impact of quality prekindergarten on school readiness – High quality prekindergarten programs will be considered in all three approaches. The professional judgment and evidence-based approaches will examine the need for prekindergarten within the framework of meeting the Maryland College and Career-Ready Standards and examine the resources needed to provide quality prekindergarten programs. The successful schools study will incorporate the costs of prekindergarten programs in the identified successful schools.
- 3.2.1.9. Contractor may recommend other factors to be included – The project team will work with MSDE staff and the Stakeholder Advisory Group to identify any additional factors to be considered in these analyses.
- 3.2.1.10. Conduct a review other states and provide a report of best practices and recommendations for the Maryland study; review the current student assessment data to determine if timeline is feasible – The project team will produce a report on best practices and a report on our recommendations for the approaches to be used in the adequacy study. For more detail, please see our study description in the section on Preliminary Studies. We will work with MSDE staff and the Stakeholder Advisory Group to ensure all data is available to complete the studies during the timeline or make recommendations for adjustments to the timeline.
- 3.2.1.11. The project team will use its years of experience in adequacy studies and state finance design to generate a final report and recommendations for implementing the results of the adequacy study.

Preliminary Studies

Review of State Adequacy Studies

Lead: Anabel Aportela, POA. Assisted by Larry Picus, Allan Odden POA, Mark Fermanich and Justin Silverstein, APA.
Addressing RFP section 3.2.1.

Over the past 15 years, an estimated 100 school finance adequacy studies have been conducted for various states. All four approaches for estimating adequacy – evidence-based, successful schools, professional judgment panels and cost function – have been used. Some states seek adequacy recommendations from all four methods, others select a specific method, and some specify at least two methods be used as required by this RFP. We will focus our review on adequacy studies conducted over the past ten years, as these will provide a comprehensive picture of the current adequacy landscape and will reflect the refinements made in methodology in recent years.

Our review will be comprised of five parts:

First we will create a table summarizing adequacy study activity in all 50 states, including those states that have not conducted a study to date. The table will include all studies done in the last 10 years and will include all methods and approaches used. The table will indicate the degree to which any specific method, or combination of methods, has dominated state adequacy analysis during the last decade. To the degree possible, the table also will indicate whether the studies were conducted for official state bodies – departments of education, legislative commissions, interim legislative committees, etc. – or conducted outside of official state sanction.

Second, we will create a set of adequacy summary tables that concentrate on the professional judgment and evidence-based methods and show the recommendations the different studies have made for each state by key programmatic elements. These elements will include at least the following:

- Core class size;
- Electives class size;
- Ratios of instructional coaches to students;
- Funds for instructional materials, technology, formative/short cycle/benchmark assessments;
- Staff for Tier 2 interventions, such as tutoring for struggling students;
- Staff for Limited English Proficient student services;
- Staff for special education services;
- Prototypical school sizes; and
- Other key factors identified by the Stakeholder Advisory Group.

Where available, we will include recommendations for base cost levels from studies using the successful schools approach. These tables will not include base expenditure figures for

the cost function studies because a cost function study cannot be conducted for Maryland due to the small number of districts and because cost functions produce spending level amounts that are specific to each individual state, and thus are not applicable to Maryland.

Third, we will identify the average or typical recommendation for each element in the adequacy summary tables. This will provide Maryland with information on how other adequacy studies and other states have addressed some of the key factors involved in determining spending levels (class size, professional development, Tier 2 intervention staffing, etc.). It will also highlight the additional resource studies identified as important to provide adequate resources for the three categories of students needing extra help noted above.

Fourth, to the degree possible, we will assess the key findings from case studies of successful schools completed in a number of adequacy studies across the United States. The goal of this work will be to determine the degree to which the key programmatic elements of states' overall school improvement strategies are reflected in the existing evidence-based and professional judgment panel adequacy recommendations.

Fifth, we will provide an analysis of best practices in adequacy studies as they have evolved over the last decade. Given that our project team includes two of the principal architects of adequacy studies, we are in a unique position to demonstrate how the methodologies have been refined and how more recent studies (e.g., Maine, North Dakota, Washington, D.C.) have effectively integrated professional judgment panels, local successful school case studies and the evidence-based approach to provide a state-specific context to the adequacy results. We also will indicate whether or not the adequacy study recommendations were adopted by the state.

Case Studies of Improving Schools and Schools Closing the Achievement Gap

Lead: Robert Croninger and Jennifer King Rice, MEP. Assisted by Anabel Aportela and Allan Odden, POA.
Addressing RFP sections 3.2.1.1, 3.2.1.3-3.2.1.8, and 3.2.2

The project team proposes to conduct multiple case studies of improving schools in Maryland. In other states it has been difficult to find schools that have made substantial improvements. However, we believe the sample frame of improving schools will be larger in Maryland because the state as a whole has produced some of the largest gains in student performance over the past decade. Our case studies will include four categories of schools:

1. Schools that meet a specified high performance level;

2. Schools that have produced large improvements in student learning over a four to six year time period;
3. Schools that have reduced the achievement gap between minority and non-minority students; and
4. Schools that have dramatically improved the performance of minority, low-income and/or Limited English Proficient (LEP) students.

To identify schools in each category, the project team will work closely with the Maryland State Department of Education (MSDE) and the Stakeholder Advisory Group to develop criteria based as closely as possible on current state standards. Because Maryland recently adopted its more rigorous College and Career-Ready Standards and is currently in the process of transitioning to the PARCC assessments in 2014-15, it is unclear whether performance results based on the Maryland School Assessments are valid indicators of current performance expectations. Therefore, we will work with MSDE to assess what, if any, adjustments to school performance data should be made to account for these emerging performance expectations. This same issue applies to our selection of schools for the successful schools adequacy approach discussed below. For purposes of this proposal we will assume that the Maryland College and Career-Ready Standards are the performance benchmarks to which the adequacy and other studies will be calibrated.

The school selection process will make use of performance data across all Maryland schools over a six year time period (2008-2013). We will seek to find schools in each of the above four categories: high performing – percent of all students that are proficient and advanced in reading and math; rapidly improving – schools showing large absolute gains in achievement over a four to six year time period; closing the achievement gap – specifically minority-related; and high performing and high student needs – improving the performance of minority/poverty/LEP students. We will select schools in each of the four categories and, if the number of schools is sufficient, select schools with high, medium and low poverty levels (using free and reduced price lunch as the likely measure of poverty) within each category. With this four by three sampling frame, we can determine whether schools in different poverty contexts produce improvements in different ways, and identify the strategies behind those differences, if found.

For all the cases, we will use a structured case protocol using a focused approach that seeks to determine how schools produced improvements in student learning, the macro and micro strategies deployed to make those improvements and the costs of those strategies. As appropriate, the staffing and cost recommendations that emerge from the evidence-based and professional judgment analyses will be adjusted based on the results from these case studies.

The structured case studies will include the following components:

- An overview of the school community and context, school size and demographics. We will select schools so that we can estimate the degree to which school size is an important and independent factor in whether schools produce significant improvements in student performance over time.
- An overview of the changes in student learning over a four to six year time period for all students in multiple subject areas, and to the extent possible for students eligible for free and reduced price meals and who are LEP.
- A description of the performance standards and goals at both the state and local levels that are driving the performance gains at the schools.
- The use of time at the school including the school schedule and how collaborative teacher time and individual teacher planning and prep time are provided and utilized.
- The school's curriculum and instruction strategy including a description of the promising instructional strategies that have been developed.
- The performance assessments employed by the schools and how they are used at the school level, focusing on formative assessments and student data used by collaborative teacher teams.
- The interventions for struggling students used at the schools, including individual and small group tutoring, extended day and summer school programming, structures for providing services to students with disabilities, structures and strategies for delivering services for LEP students. We will also explore the degree to which these strategies are embedded in a Response to Intervention (RTI) framework.
- The professional development in which the schools engage, including summer institutes, training during the year and the use of instructional coaches. We will also look at how data based decision-making is used to support instruction and teacher learning.
- The characteristics of the school culture, including teacher collaboration and the degree to which schools are characterized by ongoing discussions of instruction that are oriented to individual student learning ability.
- A description of the density of leadership, including the extent to which teachers perform instructional leadership roles.
- Each of the case study reports will include a table showing school staff by the staffing categories in the evidence-based and professional judgment models

Examples of cases produced by Picus Odden and Associates can be found in their Wisconsin, Vermont and Maine adequacy studies (www.picusodden.com), as well as in Odden and Archibald (2009), and Odden (2009; 2012). The staffing table will provide the

detail we need to compare staffing recommendations from the evidence-based and professional judgment methods to those in improving Maryland schools.

For each school, the principal, instructional coaches and key teachers, including teachers providing an array of extra help strategies, will be interviewed. Most of the interviews will be done individually but in some cases groups of two to three teachers will be interviewed. We expect the cases to require ten days per school, including three days for planning, scheduling interviews and reviewing school improvement plans and other relevant documents, two days for interviews and five days for case write up and editing following internal reviews and a review by each school principal.

The information derived from our case studies will feed into a number of the other studies we are conducting in response to the RFP. They will be used to inform all three of the adequacy approaches being used by providing detailed information about cost differentials among schools and the types of strategies and programs high performing schools and schools doing particularly well with students with special needs are supporting with their resources. For the evidence-based approach in particular, the case studies will serve to shape the model's components to reflect what we will learn about proven practices being used currently by successful Maryland schools.

Other studies that the case studies will support include our analyses of the impacts of concentrations of poverty and effective strategies for mitigating its effects, recommending specific strategies and programs for addressing achievement gaps among different student groups, assessing the relationship between deficits in student performance and school funding and the school size study.

Literature Reviews

Lead: Mark Fermanich, APA. Assisted by MEP and Kathryn Rooney, APA
Addressing RFP sections 3.2.1.1, 3.2.1.3-3.2.14, 3.2.2, and 3.2.3.1.1

For several of the studies required in the RFP, the project team will conduct systematic literature reviews to inform our analyses, provide the latest thinking from relevant research and provide insights on promising approaches used in other states and schools. The search process will involve using keyword searches of electronic databases such as Educational Resources Information Center (ERIC), Education Research Complete and Academic Search Premier. Where necessary, the project team will attempt to find other relevant studies by contacting topic-related organizations or experts and searching websites related to the topic. All articles will be reviewed critically for meeting acceptable methodological standards for inclusion in a literature review.
The studies in which literature reviews will be employed are:

- The study of the effects of concentrations of poverty on the adequacy funding targets (3.2.1.5);

- The school size study (3.2.2);
- The study of alternative proxies for identifying economically disadvantaged students (3.2.3.1.1);
- The evaluation of prekindergarten programs and the potential impact of universal access (3.2.3.2);
- The study of the impact of increasing and declining enrollments on local school systems (3.2.3.4); and
- An update to the literature base on effective practices used to guide our professional judgment panel process (3.2.1).

More specific information about each of the literature reviews is presented in the methods section of each of the referenced studies.

The Adequacy Studies

Our Adequacy Study Approaches

Since the Bridge to Excellence Act was enacted in 2002, Maryland has focused on providing an adequate funding level to ensure its students have the opportunity to meet state standards. This update focuses on ensuring students can meet the new, more rigorous Maryland College and Career-Ready standards. Working with MSDE staff and the Stakeholder Advisory Group to clearly define the standard used for the state's adequacy study is key to the success of the study. The standards to be met are the guiding focus of adequacy work and creating a document that summarizes the state standards that can be agreed upon by state stakeholders is important to ensure the credibility of the study and to guide the work for any adequacy approach selected.

While there are currently four generally accepted approaches to estimating adequacy, as described in the introduction to this proposal, early adequacy studies relied on only one approach to estimate adequacy. In 2001-02, the Maryland adequacy study became the first to use multiple approaches to estimate adequacy and implement those results into the state's funding system. Since this time numerous states have used multiple approaches. We understand that a final approach to studying adequacy will be agreed upon in November of 2014 and the project team looks forward to working with the state to finalize a plan for the study. Below is the framework we are suggesting for undertaking the work, which includes using three of the four approaches to studying adequacy: the evidence-based, the successful schools and the professional judgment approaches. We do not feel the cost function approach is a good fit in Maryland. The limited number of districts, only 24, and the lack of school level revenue and expenditure information would limit the usefulness of the approach. Jennifer Imazeki, an economist who will be undertaking the

study of the Maryland Geographic Cost of Education Index and has conducted cost function studies in several states, concurs with this assessment.

- Based upon the project team's decades of experience with adequacy studies, we feel the three approaches we propose to use in this study will provide Maryland with robust information to ensure it can provide every student in elementary and secondary education with an adequate base of financial support to be successful and meet all state standards. Further, we feel that the three approaches each have unique strengths and are best used in tandem so that the findings of each approach can be used to strengthen those of the others. The successful schools approach focuses on the actual expenditures and resource allocations of schools currently meeting state performance standards. It allows researchers and policymakers to understand what it takes to meet current standards and allows for the inclusion of efficiency screens in the approach. Our goal is to identify not only schools that are successful with students with no special needs, but schools that are beating the odds and are showing success and growth for those students with special needs as well. Case studies will also be undertaken in a number of these successful schools to understand the resources and interventions the schools are using to succeed. This case study information will be used to strengthen both the professional judgment and evidence-based approaches.
- The professional judgment approach allows state educators to identify the programming and resources they believe are needed to meet all state standards. It allows for the examination of the resource differences based on differences in student characteristics between schools and districts across the state. It also specifically examines the differences in school size and district size across the state. District and school staff from the identified successful schools will be selected to populate the panels. Information on the types of interventions and resources used in the successful schools, as well as information from the case studies, literature review, and evidence-based approach, will be used as a starting point for the process.
- The evidence-based approach brings together the best research available to identify the strategies and programs needed for students to be successful and then costs these out to estimate the necessary level of resources required. The basic evidence-based model will be reviewed by a number of professional judgment panels made up of educators from the successful schools and districts to ensure that the model provides sufficient funding for meeting Maryland's state standards and otherwise accommodates the Maryland educational context. Information from the case studies will be used to inform the evidence-based resources presented to the panels.

The three approaches will allow us to examine the needed adequate base cost and the adjustments for students with special needs in multiple ways. They will also provide the project team and state policymakers with insights into the types of inventions that are being successfully used to support students in meeting state standards. The table below shows the information that will be gained from each of the three approaches.

Table 1: Adequacy Analyses

		Professional Judgment	Successful Schools	Evidence-Based
KEY FUNDING FORMULA ELEMENTS				
IDENTIFY BASE ADEQUACY COST		X	X	X
Student-Driven Adjustments to the base adequacy cost				
Poverty/At-risk		X		X
Limited English proficiency		X		X
Special education		X		X
Gifted and talented		X		X
District/School-Driven Adjustments to the base adequacy cost				
District size differences		X		X
School size differences		X		X
Information on Interventions and Resource use				
Interventions		X	X	X
Resource Use		X	X	X

The work plan described here represents our best recommendation for how this study may be conducted. However, the ultimate approach used for this study will emerge from a collaborative process between the project team, MSDE staff and the Stakeholder Advisory Group as we design the final adequacy study methodology.

The Evidence-Based Approach

Lead: Allan Odden and Lawrence Picus, POA. Assisted by Anabel Aportela and Michael Goetz, POA

Addressing RFP Section 3.2.1

The evidence-based (EB) approach to determining the adequate financial base follows the principle of determining a funding level that would be adequate to allow each school district to provide a quality education that is effective in delivering standards to prepare all students to be college and career ready. In Maryland, those are Maryland's College and Career-Ready Standards that have incorporated the Common Core State Standards. The project team will use its extensive team experience in this approach to help Maryland determine an adequate level of school funding.

A school improvement component has become embedded in the EB model over the years. These ten school improvement strategies are described below. If districts expend the funds for the base foundation level and the adjustments for student needs to support these school improvement strategies are made, districts should be able to produce large improvements in student academic achievement for all students, and substantially reduce student achievement gaps linked to demographic variables. The EB approach identifies an adequate base fiscal foundation and signals to schools ways to use those resources to dramatically boost student learning.

The School Improvement Model

The EB model that we use to estimate an adequate spending level for schools is based on two major types of research:

1. Reviews of research on the student achievement effects of educational strategies used in the EB model. In recent years, we have included the growing number of randomized controlled trials (RCTs) that have been conducted on educational strategies to identify components of the model.
2. Studies of schools and districts that have dramatically improved student performance over a four to six year period – what we have sometimes labeled "a doubling of student performance" on state tests.

These research findings are summarized in Odden and Picus' textbook, *School Finance: A Policy Analysis, 5th edition* (2014), as well as in several books that profile schools and districts that have moved the student achievement needle (e.g., Odden & Archibald, 2009; Odden, 2009; Odden, 2012). Furthermore, we have studied improving schools in Vermont and Maine where Picus Odden and Associates have recently conducted school finance studies. We have found that the theory of improvement embodied in the evidence-based model is reflected in nearly all these cases (see Picus, Odden, et al., 2012; Picus, Odden, et al., 2013). We also found similar strategies in the improving schools we studied in our 2006 school finance adequacy studies for Washington (Fermanich, Mangan, Odden, Picus, Gross, B. & Rudo 2006), our 2007 adequacy study for Wisconsin (Odden, Picus, Archibald,

Goetz, Mangan, & Aportela 2007), our 2008 adequacy study in North Dakota (Odden, Picus, Goetz, Aportela & Archibald, 2008), our 2012 equity study in Vermont (Picus, Odden, Glenn, Griffith, & Wolkoff, 2012), and our 2013-14 adequacy study in Maine (Picus, Odden, Goetz, Griffith, Glenn, Hirschberg & Aportela, 2013; Picus, Odden, Goetz, Archibald & Griffith, 2013). These studies show that the EB model identifies how districts and schools can use their resources to implement programs and strategies that allow them to produce dramatic gains in student academic performance for all students.

In general, we find that schools and districts that produce large gains in student performance follow ten similar improvement strategies, resources for which are included in the EB model:

1. Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap. The test score analysis first includes analysis of state test results and then the use over time of formative and benchmark assessments to help tailor instruction to precise student needs and to identify and monitor interventions for struggling students.
2. Set higher goals including aiming to educate 95 percent of the students in the school to proficiency or higher on the state exam; seeing that a significant portion of the school's students reach advanced achievement levels, which for Maryland, are Maryland's College and Career-Ready Standards; and make significant progress in closing the achievement gaps linked to demographics.
3. Review evidence on good instruction and effective curriculum. Successful schools throw out the old curriculum, replace it with a different and more rigorous curriculum, and over time, create their own specific view of what good instructional practice is to deliver that curriculum.
4. Invest heavily in teacher training that includes intensive summer institutes and longer teacher work years, and provide resources for trainers and, most importantly, fund instructional coaches in all schools. Time during the regular school day and week is provided for teacher collaborative work groups to use student data to improve instruction.
5. Provide extra help for struggling students and, with a combination of local, state funds and federal Title 1 funds, provide some combination of tutoring in 1:1, 1:3 or 1:5 tutor-student ratio formats. Over time this also includes extended days, summer school and English language development for all Limited English Proficient (LEP) students.
6. Create smaller classes in early elementary years, often lowering class sizes in grades kindergarten through three to 15 students, citing research from randomized trials. Sometimes this includes small overall school size as well.

7. Restructure the school day to provide more effective ways to deliver instruction. This includes multi-age classrooms in elementary schools and block schedules and double periods of mathematics and reading in secondary schools. Schools also protect instructional time for core subjects, especially reading and mathematics.
8. Strong leadership support around data-based decision making and improving the instructional program by the superintendent, the principal and teacher leaders, including instructional coaches.
9. In the process, create professional school cultures characterized by ongoing discussion of good instruction and by teachers taking responsibility for the student performance.
10. Bring external professional knowledge into the school. For example, hiring experts to provide training, adopting research-based new curricula, discussing research on good instruction and working with regional education service agencies, as well as the state department of education.

The evidence-based funding model is built upon a theory of action that is designed to allow districts and schools to dramatically improve student performance. Our review of case studies of schools and districts dramatically moving the student achievement needle, and of the individual programs involved, produces a set of resources that we have concluded are adequate to accomplish the student achievement goals of most states. These previous studies are relevant to the proposed work in Maryland because they take into account implementing new standards, including Common Core State Standards, designed to prepare all students to be college and career-ready for the emerging global, information-based economy. We will conduct the EB study and case studies in Maryland to ensure that the overall model and set of recommendations are specifically tailored to the Maryland context.

The theory of action for improved student outcomes includes other specific components. The improvement model incorporated in the EB model envisions teachers working in collaborative groups, meeting daily if possible, using student data to continuously enhance the core curriculum program and identifying and monitoring the progress of students who need extra interventions to achieve the standards. Teachers engage in these collaborative groups with the ongoing assistance of instructional coaches who help teachers interpret the implications of the student data and model effective instructional practices. The teachers and instructional coaches are also engaged in ongoing professional development, focused in part on developing and enhancing standards-based instructional units (each focusing on a specific content concept), and using assessments to determine student learning at the end of each curriculum unit taught.

Students struggling to learn to rigorous standards are then provided multiple strategies

that extend instructional time. The extra help is an individual student-focused combination of tutoring during the regular school day, academic help before and after school, and academic oriented summer school for at least eight weeks during the summer. The model also is robust enough to allow schools and faculties to tap the potential of computer technologies. It also provides ample resources for instructional materials, as well as the short cycle/formative assessments teachers need for their ongoing collaborative work. This theory of action guides the elements of our funding model. The hope is schools would also follow this approach, unless they have a different and equally effective plan, which we have not yet seen in any state.

Methods

Our approach to using the EB method for Maryland will mirror and build on the improvement model described above. Our analysis will include the changes we have made to the model over time and will incorporate findings from the school improvement case studies conducted in Maryland. These changes are based on advances in educational research, changes in policy and practice around the country and other adjustments we have made to our overall analysis approach. For the EB component of this study, we will review the core resources needed for the following programmatic elements for both schools and districts:

Staff:

- Core classes and class size
- Elective classes and class size
- Instructional coaches
- Substitute teachers
- Pupil support: guidance counselors, nurses, etc.
- Instructional aides
- Librarians
- Principals and assistant principals
- School secretarial services

Dollar per pupil figures for various services:

- Gifted and talented services
- Career and technical education
- Professional development and training
- Technology and related computer equipment
- Instructional materials and formative assessments
- Student activities

District level:

- Central office administration
- Maintenance and operations

In addition, we also will assess our recommendations for struggling students:

- Tutors as the first Tier 2 intervention in the Response to Intervention (RTI) framework
- Extended day programming
- Summer school
- Extra pupil support
- LEP students
- Students with disabilities
- Alternative schools

Our approach will be to review the research on each of the topics identified above, update the findings that we have previously published (Odden & Picus, 2014) and used in other state studies with new research, and determine how our core formulas should be updated or changed to meet the needs of Maryland. We will augment this analysis with more recent literature, in many cases with RCTs, and with the results of school case studies that we propose to conduct in Maryland as part of the overall project.

Our approach uses a 3,900 student prototypical district with four 450 student kindergarten through fifth grade elementary schools, two 450 student sixth through eighth grades middle schools and two 600 student ninth through twelfth grades high schools. We estimate the resources needed in each prototypical school, and add to that, resources for central office functions, operations and maintenance and other district costs. This leads to an estimated per pupil funding level. We add to this the estimated per pupil costs of providing programs for students with special needs such as compensatory education, LEP and special education services. Finally, our model includes adjustments for small school districts to accommodate the dis-economies of scale associated with the operation of these districts. This adjusted figure is used to determine total adequate funding for each district and for the state as a whole. The standard size of 3,900 students is appropriate for most states in the country, even states with many smaller, as well as many larger, districts, and we use it as the starting point for computing a per pupil adequacy level in any state. Because virtually all Maryland districts have enrollments exceeding 3,900 students, we will incorporate the results from the professional judgment panels to modify our prototypical district size, if necessary.

As part of the EB model, we will develop a Microsoft Excel-based simulation that estimates adequacy levels for the state and estimates each district's total revenue. The model will be

designed so that each of the cost factors (i.e. class size or teacher salaries) can be modified and new total costs estimated.

Our Excel model will include a funding formula for comprehensive prekindergarten programming. The elements of this model were used in a 2008 Foundation for Child Development project to estimate prekindergarten costs for all 50 states in the country (Picus, Odden & Goetz, 2009), as well as in several adequacy studies where we were asked to estimate costs for an adequate prekindergarten program (e.g., Maine). The elements of the model will be aligned to the analyses of Maryland prekindergarten programs that will be covered by other aspects of the proposed project.

In addition to the model's estimate of adequate levels of resources, we will conduct four professional judgment panel sessions to review the elements of the EB model and consider how they reflect education needs in Maryland. These panels will be organized in a manner similar to that described in the professional judgment section, but will be led by Picus and Odden and designed to solicit input on the EB model.

Successful Schools Approach

Lead: Mark Fermanich and Justin Silverstein, APA.
Addressing RFP Section 3.2.1

The project team will employ the successful schools approach as one way to determine an adequate base level of funding and needs-based student weights for Maryland. We will then integrate the results of this study with those of the evidence-based and professional judgment studies to provide a single, more accurate and comprehensive cost estimate. Typically, the successful schools approach is conducted at the district level (known as the successful school district or SSD approach). However, because Maryland has only 24 school districts we are concerned about the precision and reliability of results based on so few districts. Therefore, in this study we will work at the school level to identify individual successful schools and analyze the costs associated with them. This is the same approach used by APA in its study for the Thornton Commission (Augenblick & Myers, 2001).

The basic process used in the successful schools approach is to: 1) identify high performing schools; 2) analyze school spending levels (excluding spending for student need-based programs such as special education or LEP); and 3) determine a per pupil base spending amount from the school expenditure analysis. An additional step we have added in recent studies is to conduct case studies of particularly high performing schools, especially those with higher concentrations of at-risk students, to learn more about the specific strategies and programs contributing to their success. Each of these steps is described in more detail below.

Methods

Identifying High Performing Schools

APA will work closely with MSDE to develop criteria for identifying successful schools at the elementary, middle and high school levels. We understand that "success" may be defined in multiple ways, including measures of absolute or status high performance, rapidly improving, closing the achievement gaps between diverse groups of students, and/or performing highly for students with high needs. To the extent possible, we will use performance measures aligned with the Maryland College and Career-Ready Standards. We will also work with MSDE to ensure that we are making use of the correct mix of performance data for identifying high performing schools and institute a review process based on their knowledge of the state's schools to ensure that the schools selected are truly representative of high performing schools in the state. Our goal is to ensure that there is agreement among stakeholders that the schools selected are acknowledged as high performing.

In selecting successful schools we will look to include, not only high performing schools generally, but also schools that meet additional performance criteria noted in the case studies method section above, such as schools that have produced large improvements in student learning over a four to six year time period; schools that have reduced the achievement gap between poverty and non-poverty students, as well as minority and non-minority students; and schools that have dramatically improved the performance of minority, poverty and/or LEP students. We will also work with the Stakeholder Advisory Group to identify other criteria for selecting successful schools such as, schools with different levels of need (e.g. differing concentrations of students in poverty, LEP or special education students), different school sizes, and different locales (such as urban, suburban or rural).

Analysis of School Expenditures

Once high performing schools have been identified, we will work to collect school expenditure data. Because Maryland only collects spending data at the district rather than school level, we will develop a school expenditure data collection tool, similar to the tool or template we used for our earlier study for the Thornton Commission, to gather comprehensive and accurate school level expenditure data. We will meet with district administrators in those districts from which schools are selected at the start of our analysis to facilitate expenditure data collection. In our earlier study we limited data collection to 59 high performing schools. We will work with MSDE to determine if new technology, such as a web-based tool, may allow us to collect data from a larger number of schools. We will make use of state and district data sources for the collection of district level expenditures that should be allocated to the participating schools, such as centralized student support services.

The data collection tool will focus on four financial areas: 1) school instruction; 2) school administration; 3) district administration; and 4) other costs. School instruction includes each school's expenditures for personnel providing instruction as well as for instructional supplies and materials, extracurricular activities, professional development and substitutes. School administration will focus on the office of the principal for the school, including salaries, benefits and other spending. District administration includes central office costs including general support services, business support services, centralized support services and instructional administration and support. We will use this data to determine the overall district administration costs and then allocate these to the school based on the school's percent of district-wide enrollment. The final area, other costs, will include student personnel services, student health, operation of plant, maintenance, community services, and fixed charges.

Determining a Per Pupil Base Cost

The final step is to calculate a per pupil base cost amount using the expenditure data collected through the process described above. Because we are only interested in base costs for this part of the analysis, we exclude spending on programs for students with special needs, such as low income, special education and LEP. We will standardize the expenditure data across the participating schools and determine a weighted average base cost per student for each school level: elementary, middle and high. From these, we will derive a single base cost per pupil that is weighted by the distribution of students across the three levels. If applicable, we will also look at how base costs differ by school characteristics such as need level, size or locale.

We will use the results from our evidence-based and professional judgment panel studies to determine what the appropriate funding weights should be to address specific student needs such as poverty, LEP students, students with disabilities or gifted students. This illustrates the strength of applying multiple approaches to determining adequate levels of school funding, the results of one approach may be used to confirm and supplement the results of the other approaches, resulting in more accurate and reliable findings.

Our team will also make use of a series of case studies carried out in a subset of our high performing schools sample. These case studies will be used to identify, describe and cost out any common instructional strategies and approaches found across multiple successful schools. The information from these case studies will be used to inform our base cost estimates developed in this study.

In summary, we will work closely with MSDE staff and the Stakeholder Advisory Group to develop criteria for identifying high performing schools for inclusion in the successful school analysis, to vet our initial selection of schools and to advise and assist with data collection. We also will conduct a series of school case studies for identifying common

resource use patterns which will help to inform our final base cost estimates and to provide policymakers with rich information about effective strategies currently employed in Maryland schools.

Professional Judgment Approach

Lead: Justin Silverstein, APA. Assisted by Amanda Brown, APA
Addressing RFP Section 3.2.1

The professional judgment (PJ) approach is another of the three approaches the project team will use in order to estimate the resources needed to ensure all students can be successful. This component of the study will be led by APA which has the most extensive experience of any firm in conducting this approach.

The PJ approach is the most widely used adequacy approach and is unique because it allows a discussion of the resources needed to meet all state standards and requirements, such as the Maryland College and Career-Ready Standards. Further, this approach relies on the experience of leading state educators to estimate the resources needed to meet all identified state standards and performance expectations. Resources are not discussed as total per pupil figures needed but instead the approach focuses on the specific personnel, technology and interventions that are needed to serve students, both at the school and district level. Examples of the types of resources discussed include: personnel full-time equivalent (FTE) positions needed, such as teachers, pupil support and administrators; non-personnel costs such as supplies and materials, textbooks and assessment costs; technology hardware; and additional interventions like before and after school, or summer school. A base level of resources is first identified for all students regardless of need, then the additional resources above and beyond what is in the base are identified for students with special needs, such as compensatory education, LEP and special education. Further, the approach allows for an analysis of the impact of school and district size on resource needs.

Methods

In our refined PJ approach we facilitate multiple rounds of panels that review and build upon the work of prior panels. Each panel includes experienced and well-regarded educators from successful schools and districts in the state from a variety of positions, including teachers, principals, district administrators and chief financial officers (CFOs). The first school level panels examine the school level resources needed to serve students regardless of need in different sized elementary, middle and high schools to meet performance standards, including personnel, non-personnel costs (like supplies and materials), technology and intervention programs such as summer school and afterschool programs. The next round of panels reviews the work of the school level panels, then

identifies the additional resources and interventions needed to serve students with special needs such as compensatory education, LEP and special education. We have found that, due to the special challenges involved with getting very high percentages of these students to reach performance standards, such focused panel expertise is extremely useful. The district level panels then review the work of all prior panels, and layer in the additional district level resources needed to support schools. A separate CFO panel may follow to review all school level and district level non-personnel costs. A final statewide review panel reviews the work of all panels that preceded it, discusses resource prices, examines preliminary cost figures and attempts to resolve any inconsistencies that may arise.

We have found that the PJ process is greatly enhanced when it is informed by other adequacy analyses, and as such will use information gathered from the case studies, literature review and data gathered from successful schools, such as class sizes, pupil support ratios or effective strategies, as a starting point for professional judgment panel discussions. This ensures panelists have access to what the research and best practices say about the types of resources needed for students to succeed. The team will also use the successful schools approach to benefit the PJ analysis by involving educators who work in successful schools and districts on the panels. This helps ensure that panels have the benefit of learning from these successful places and the types of resources they use.

Recommended Panels in Maryland

To implement this approach in Maryland, the project team recommends conducting up to ten professional judgment panels. As noted above, there are several reasons why using multiple PJ panels is important: (1) it allows for the separation of school level resources from district level resources; (2) multiple panels can study schools and districts of varying sizes so that we can determine whether size has an impact on cost; and (3) we believe strongly in the importance of having each panel's work reviewed by another panel.

The panels will include a mix of the following:

- Three to four school level panels to examine the school level resources needed to meet performance standards. Panels will address resource needs in different size elementary, middle and high schools. School sizes to be considered will be based upon average existing Maryland schools, as well as school sizes informed by the school size study. Additionally, a separate school level panel will be held to focus on prekindergarten programs, which will be informed by the preliminary results of our prekindergarten evaluation.
- Two to three special needs panels to review the work of the school level panels, and then address the specific resources needed for schools and districts to adequately serve students with special needs, including those who are in special education, compensatory education, LEP, or gifted programs.

- One to two district level panels to review the work of all prior panels and examine district level staffing and resource needs to support schools.
- One CFO panel to review all school-level and district-level non-personnel costs.
- One statewide overview panel to review all previous panel work, discuss resource prices, examine preliminary cost figures and attempt to resolve any inconsistencies that may arise. In consultation with MSDE, individuals from around the state who have broad experience with Maryland's education system will be selected to serve on this panel. Depending on its specific makeup, this role may be played by our Stakeholder Advisory Group.

Identifying a Per Pupil Base Cost and Adjustments

After resources have been identified and rigorously reviewed though this iterative process, Maryland salaries and prices will be applied to each of the school and district level components identified by the panels to determine program costs. This process will allow us to develop a base cost and a series of weights for special needs and possibly for school size. A total cost is calculated by building up the cost components for the school types and district administration.

Using the Results

Once all three approaches have been completed the full results will be analyzed together. Table 1 above, described the information that will come from each approach. Using multiple approaches will yield adequate base cost information from all three approaches. The additional resource needs for students with special needs will be derived from the professional judgment and evidence-based approaches. Information on the different resource needs for varying school and district sizes will also be derived from the professional judgment and evidence-based approaches.

The project team team will work with the MSDE and the Stakeholders Advisory Group to first understand the causes of any differences in results among the three approaches. Once these causes are understood, the team will work with the Stakeholder Advisory Group to reconcile the differences and determine a single adequate base cost that best reflects the resources needed for all students to meet the Maryland College and Career-Ready Standards. We will also determine the appropriate adjustments for students with special needs and any necessary adjustments for school or district size differences.

School Size Study

Lead: Cheryl Humann, Humann Consulting. Assisted by Shawn Stelow Griffin, Collaborative Communications, and Justin Silverstein, APA.

Addressing RFP Section 3.2.2

There are many factors that contribute to educational outcomes and system efficiency: school size, class size, grade configuration, consistent matriculation patterns, geographical constraints and local governing requirements to name just a few. There is research and data available on many of these factors and their impact on education. The project team will collect and synthesize the available data and provide overall recommendations to Maryland regarding optimal school size.

The Context and the Study

Maryland has a relative small number of districts. There is, however, significant diversity in population size and density as well as economic status that affects school system operational costs. Radiating out from the Washington D.C. suburbs, Maryland's school system consists of:

- Large, urban districts with relatively high levels of average income and high real estate values that are performing well in most areas (Montgomery, Prince George's County and Baltimore City);
- Large suburban school systems, some of which are still highly urbanized (Howard, Anne Arundel, and Baltimore County);
- Exurban school districts that have experienced significant growth over the past decade (Harford, Frederick, Queen Anne's, Carroll, Washington, Calvert, St. Mary's and Charles); and
- Relatively rural districts with one or two high schools and middle schools (Alleghany, Worcester, Wicomico, Caroline, Dorchester, Kent, Garrett, Talbott, Somerset and Cecil).

Through a carefully designed approach that contains four main components: data collection from the districts, data collection from recognized facility planner professionals, a thorough literature review, and analysis of the collected data, the study team will be able to provide overarching recommendations on school size. The table below shows how each study component contributes to the completion of each of the study elements.

Table 2: School Size Study Elements

Study Element	Data Collection – District and Local Municipalities	Data Collection – Facility Planner Professionals	Literature Review	Analysis of Data and Recommendations
Local policies regarding size of schools	X			
Best practices in other states regarding school size	X	X		
Educational and extracurricular impacts of school size, and the impact, if any, on the surrounding neighborhoods	X	X		
Factors that contribute to large school size and recommendations for mitigating those factors	X	X		X
Recommendations for the ideal school size		X	X	X
Processes that can assist in ensuring public input into school size standards or guidelines		X	X	X
Models for the creation of smaller schools, including the subdivision of existing schools into multiple administrative units within the same campus, which share common areas such as cafeterias and sports fields		X	X	X
The costs and impacts of zoning laws that require new schools to be built to accommodate new development and how those costs can be reduced	X	X		X
The potential impacts on the Maryland Public School Construction program of establishing stricter policies regarding smaller schools, such as higher costs	X			X
School boundaries and attendance areas and how those affect school size	X		X	X
Whether opportunities are available for alternative methods to create space for smaller schools, including the purchase and renovation of existing buildings where available and including suburban and rural school design	X	X		X

Methods

Collection of Data from the Districts

In addition to completing a review of published district board and facilities department's policies and regulations, the project team will look for generally collected and reported data both nationally and statewide, such as the National Center for Education Statistics' school district boundary and demographic information, which can be exported to our mapping software. This information will be validated for accuracy by the districts, through the development of a comprehensive survey and request for information from the districts. The survey will be implemented in electronic format, i.e. Survey Monkey, to minimize the impact to the school administrative staff.

We will follow-up with each district facilities planning director to review the data request and clarify any questions. In addition to school size policies or guidelines, the survey request will include information related to capital construction funding, class size guidelines, current school capacity, enrollment forecasting, district boundary and matriculation patterns, student mobility rates, policies of use of portable classrooms, free and reduced meal data, standardized achievement data for each school and transportation policies.

The project team will also research and contact the following national and Maryland organizations and agencies for information related to school size:

- County and local planning departments – demographic data, zoning and development requirements, planning requirements for growth and impact of extracurricular activities on communities;
- Maryland Public Secondary Schools Athletics Association (MPSSAA) – awareness and understanding of the enrollment-based athletic classification system 4A to 1A;
- The Maryland Association of Student Councils – impacts of extracurricular activities on school size;
- The Maryland State Education Association – impacts of school size on education; and
- National Center for Education Statistics – base demographic data.

Collection of Data from Educational Facility Planners

To collect current research and best practices related to school size requirements and community engagement, we will complete the following activities:

- Review other U.S. state education agencies that have adopted school size guidelines or commissioned similar studies;
- Contact and interview representatives from the Council of Educational Facility Planners International (CEFPI);

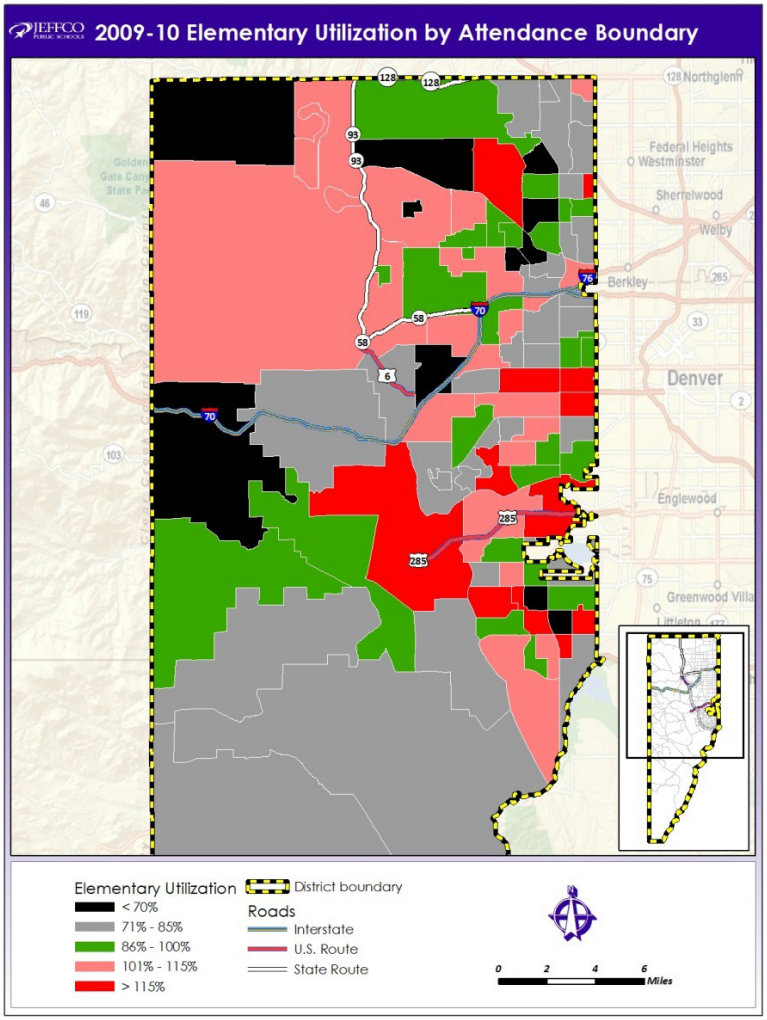
- Contact and interview representatives from the Council of Great City Schools (CGCS); and
- Complete an extensive literature review – including scanning the National Clearinghouse for Educational Facilities for posted research articles.

The project team will also conduct a work session with Mr. Sam Wilson and Mr. Tracy Richter; two nationally recognized K-12 facilities planners.

Summarizing the Data

A mock-up of the resulting map for a single district is displayed in the image below.

Figure 1



Data Analysis and Recommendations

After the data have been collected from the districts and Educational Facility Planners, the study team will compile and present the data in easy to understand maps, charts and graphs that will become part of the Summary of School Size Findings. The study team will then begin their analytical review of the data. The analysis will include the development of sample cost models that include programmatic costs and operational support costs for different school sizes at each educational level: elementary, middle, high schools, and alternative schools. The results of the analysis, case studies, the cost modeling and recommendations will be included in the preliminary and final school size study report.

The results of the study should lead to various recommendations for funding in Maryland in the future. The results will be used in Phase II to help guide the final recommendations of the school size study as well as contribute to the adequacy study recommendations and the increasing and declining enrollment study. For example, the school size study results will be used to inform any adjustments for school size emerging from the adequacy study approaches. The School Size Study report will be a tool or "road map" for districts as they develop and implement a maximum enrollment plan that relates to the needs of their student and parent population. Finally, it will provide the MSDE the Public School Construction program short-term and long-term cost impacts.

Other Requested Studies

In addition to the preliminary and adequacy studies the RFP calls for several other related studies of specific issues related to Maryland's school finance system. The following section describes our approach to undertaking each of these studies.

Identifying Economically Disadvantaged Students Using Free and Reduced Price Meals Eligibility

Lead: Gail Sunderman and Bob Croninger, MEP
Addressing RFP section 3.2.3.1.

Community Eligibility Provision

Under the Healthy, Hunger-Free Kids Act (HHFKA) of 2010, Congress included a Community Eligibility Provision (CEP) that permitted all students in high-poverty schools to receive free breakfast and lunch in schools that serve communities with 40 percent or more of students participating in one or more of the following programs: Supplemental Nutrition Assistance, Temporary Assistance for Needy Families, or the Food Distribution Program on Indian Reservations. In addition to participation in these programs, schools

may consider the percent of students who are in foster care, enrolled in Head Start, homeless, runaway or migrant. Families that attend a school with 40 percent or more of students that meet one or more of these criteria qualify to receive a free breakfast and lunch under the School Breakfast Program and the National School Lunch Program.

The Healthy, Hunger-Free Kids Act increases federal reimbursement for schools providing meals to students through the Community Eligibility Provision, and the United States Agriculture Department (USAD) claims that the law reduces administrative costs, making the cost of delivering services less expensive for schools (Levin & Neuberger, 2013). Even so, states may experience added expenses depending on the number of schools that qualify for providing free meals under CEP. Ten states and the District of Columbia have piloted implementation of the law. Maryland implemented the law during the 2013-2014 school year, and the law will be implemented nationwide during the 2014-2015 school year. The actual costs to Maryland due to the implementation of the law have not been evaluated.

According to the Food Research and Action Center, most schools that currently enroll 75 percent of their students in the free and reduced price meals program (FRPM) will meet CEP criteria (Levin & Neuberger, 2013). Because this is a national estimate, the project team will perform sensitivity analyses using MSDE enrollment and implementation data from 2013-2015 to determine the percent FRPM enrollment that best captures CEP eligibility in Maryland. Using the results of these analyses, we will examine FRPM enrollment trends in Maryland using Common Core Data (CCD) to identify the number of eligible schools in the past ten years, and then use these data to project the number of eligible schools for the next ten years. The Maryland Equity Project has used the CCD to estimate past and future racial/ethnic and low-income enrollments in school districts throughout the state. The CCD provides reliable data for estimating the number of schools in each district that are and will become eligible for free meals under CEP.

Methods

To estimate the costs associated with the implementation of HHFKA in Maryland, we will use implementation data from the 2013-2014 school year. We will examine costs associated with implementation, increased federal support and projected savings in administration of the free and reduced-price meal program anticipated by USAD (Osmon & Rymut, 2013). When appropriate, we will also collect data from other states that implemented the program between 2010 and 2013 (a total of ten states and the District of Columbia). Some of these states have multiple years of implementation data that may be useful in estimating the costs associated with the growth in the number of schools that use CEP to expand their free breakfast and lunch programs.

Alternative Indicators for Poverty or Economic Disadvantage

A fundamental goal of the adequacy studies conducted by the project team is to estimate the cost of educating students at elevated risks of school failure. While many studies use a student's FRPM status as an indicator of students who come from economically disadvantaged homes (Duncombe & Yinger, 2005; Verstegen & Jordan, 2009), other indicators are possible and may be more appropriate when considering the costs associated with the education of at-risk students (Odden & Picus, 2014).

One consideration is whether FRPM enrollments accurately capture variation between schools in the challenges that educators face in addressing the needs of economically disadvantaged students. Because students who qualify for FRPM fall within a broad range of family incomes, schools with equal percentages of FRPM enrollments may enroll students from substantially different economic backgrounds. Moreover, many families do not apply for FRPM services, even though they are eligible, especially in the upper grades where students fear being stigmatized by participating in the program (Kurki, Boyle, & Aladjem, 2005). There is also growing evidence that FRPM enrollments, though a convenient indicator of economic disadvantage, may not capture fully the effects of having concentrated enrollments of low-income students at schools (Jargowsky, 2013; Starkey, 2013).

As part of the proposed adequacy study for Maryland, we will explore alternative indicators of economic disadvantage that might be used in Maryland's school funding formula. For example, in their study of adequacy in the District of Columbia public schools, where FRPM enrollments are uniformly high, APA used indicators associated with CEP under HHFKA (The Finance Project & Augenblick, Palaich, & Associates, 2013). To capture the effects of different concentrations of students from low-income families for their adequacy study for Connecticut, APA developed a graduated scale for FRPM enrollments that assigned increasingly larger weights for higher concentrations of FRPM enrollments (Augenblick, Palaich, & Associates, 2005). In some states, such as Colorado and Minnesota, the at-risk funding formula adjusts funding upward for districts with higher concentrations of at-risk students (Verstegen, 2011).

Because APA and Picus Odden & Associates have conducted the vast majority of adequacy studies across the nation, each has developed a detailed database of education formulas in most states. These databases will be combined, and, where necessary, supplemented with additional detail about the indicators states use to identify at-risk students. We will also conduct a literature review to identify alternative indicators that have been proposed by research that connects indicators of school and neighborhood disadvantage to education outcomes, such as census data on family households and neighborhoods (Kingsley & Pitingolo, 2013), as well as factors from human services and other sources that could be accessed by the state (Fantuzzo, LeBoeuf, & House, 2014).

Once we have developed a list of possible indicators of economic disadvantage, we will explore the statistical relationship of these indicators with each other and as predictors of education outcomes, primarily achievement. Possible indicators will be assessed in terms of accessibility, accuracy, stability and face validity. Accessibility refers to the difficulty associated with gathering the information required to develop and use the indicator as part of the funding formula; accuracy refers to how well an individual indicator (or set of indicators) predicts education outcomes; stability refers to the extent to which an association between an indicator and education outcomes persists over time, especially in the case of data that is not available annually; face validity refers to the extent to which the validity of an indicator would be accepted broadly by policymakers, educators, and the public.

Using these analyses, we will provide recommendations to the state regarding the trade-offs associated with different indicators of economic disadvantage, including FRPM. We will identify an indicator or set of indicators that are readily accessible, accurate in predicting education outcomes, stable over time and have strong face validity.

Prekindergarten Study

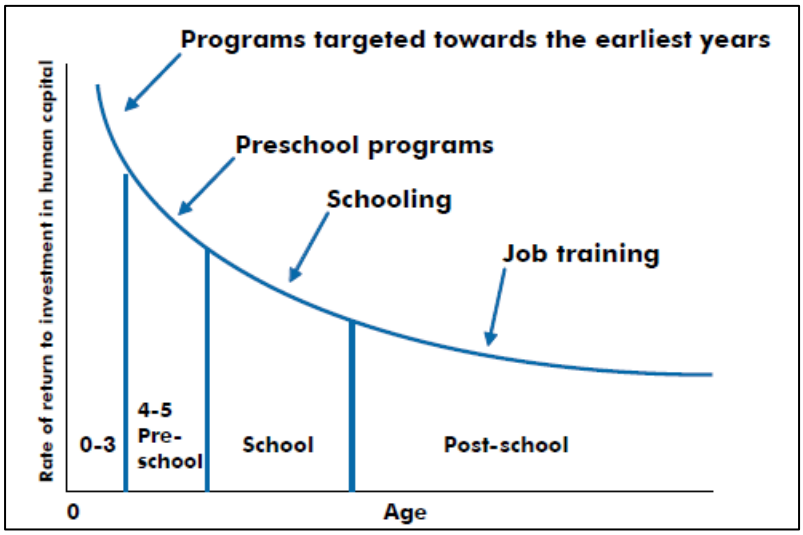
Lead: Bob Palaich, APA. Assisted by Simon Workman, APA, and Anne Mitchell, Early Childhood Policy Research.
Addressing RFP section 3.2.3.2.

Since the 2002 Bridge to Excellence in Public Schools Act was implemented, the number of 4-year-olds enrolled in prekindergarten in Maryland has increased over 50%, with all local school districts required to provide prekindergarten to disadvantaged 4-year-olds. Services are provided beyond this requirement by both school districts and private providers. In 2013, an estimated 35% of 4-year-olds were enrolled in publically funded preschool (Maryland Equity Project, 2014). A bill passed in 2014 will expand access to half-day prekindergarten to about 1,600 students from moderate-income families.

Numerous studies have been completed recently that highlight the importance of early childhood education, both to the individual student and to society as a whole (Aos et. al., 2007; Aos et. al., 2011; Belfield, 2006; Daniels et. al., 2007; Heckman, 2008a, 2008b, 2014; Karoly, 2005; Reynolds et. al., 2009). Heckman (2008a; 2008b; 2014) has shown that early investments in education result in greater returns later in life, including increased college graduation rates, reduced criminal justice costs and improved adult health outcomes. As shown in the chart below (Heckman, 2008b), returns are greatest for investments made in the early years as compared to later investments.

Figure 2

Returns to Unit Dollar Invested at Different Ages (Heckman, 2008b)



Given the evidence about the benefits of early childhood education it is important for Maryland to have a complete and accurate picture of its current prekindergarten landscape in order to determine the costs and benefits of expanding access. The study team will analyze the current capacity and enrollment profile of prekindergarten services in Maryland, including both the mandated programs and the additional services provided by districts and private providers.

With no dedicated state funding stream for prekindergarten, local school districts provide the largest proportion of program funding. According to the National Institute for Early Education Research, 2012 per pupil funding for preschool in Maryland averaged $8,599 per child enrolled, with $3,609 of this total coming from state funding. This study will include a detailed discussion of all current funding streams available for prekindergarten. The study will develop a cost-benefit methodology detailing the projected return on investment of current and expanded services, using Maryland specific data. Finally the study will make recommendations for expanding prekindergarten access, including steps to phase-in universal access, focusing on the required additional capacity, additional funding and projected return on investment.

The proposed study will comprise three parts:

1. Overview and comparative analysis of current prekindergarten services and funding
    - The first part of this study will evaluate current prekindergarten services and funding in Maryland. The evaluation will include services provided by both

districts and private providers, and will analyze all funding sources (state, federal, local and private).

- The evaluation will include analysis of current enrollment and capacity across the state, with breakdowns by region and provider type.
- The study will analyze the distribution of quality across the state, using Maryland EXCELS to define quality. Separate quality distribution profiles will be produced for public and private providers.
- Specific comparisons with data from states similar to Maryland will be presented, based on geography, economy and population profiles.

2. Cost-benefit analysis of providing universal prekindergarten
    - Nationally recognized and reviewed studies will be utilized to inform a cost-benefit analysis of providing universal prekindergarten services in Maryland. Data will be modified for the specific Maryland context to provide a customized cost-benefit methodology for the state.
    - The study will define high-quality prekindergarten using Maryland EXCELS and the methodology will include variations in costs and benefits based on the different quality levels. A cost-benefit analysis will be produced for the current system, showing the return on current spending. Additional scenarios will model the variation in projected return for different levels of investment, including expansion at the current quality distribution and expansion at an increased level of quality. In order to estimate the cost of quality, the study will utilize the Provider Cost of Quality Calculator that APA developed in partnership with Anne Mitchell from the Alliance for Early Childhood Finance and the U.S. Office of Child Care.
    - The study will also model the effects of serving children from families at varying income levels, as well as the impact of serving 3-year-old children in addition to 4-year-olds.
3. Recommendations
    - Informed by the cost-benefit analysis and research on the current services and funding, the study will make recommendations detailing how Maryland can expand access to high-quality prekindergarten. The recommendations will focus on the cost to provide services that will ensure children leave prekindergarten ready for school.
    - The recommendations will detail the number of additional prekindergarten seats required to offer expanded access, including phasing-in universal access. The estimated cost to provide these services at a level of quality that promotes school readiness, and the expected returns of the proposed investment will be presented.

- The study will include recommendations for alternative approaches to funding, including those based on enrollment.

Equity Analysis

Lead: Larry Picus and Michael Goetz, POA
Addressing RFP section 3.2.3.3.

Using data from all 24 of Maryland's school districts, we will conduct a comprehensive school finance equity analysis for the state. We start with the standard framework for equity analysis first developed by Bob Berne and Leanna Stieffel, as described in Berne and Stiefel (1984) and Odden and Picus (2014). The equity analysis will cover 12 years depending on data availability. We will analyze both per pupil revenue and expenditures excluding revenues and expenditures for transportation and capital outlay.

To assess equality of resources across districts, we will use the standard school finance statistics including the range, range ratio, coefficient of variation, the McLoone Index, and the Verstegen Index. We will address vertical equity, or the degree to which the system makes appropriate adjustments for varying student needs, by using traditional pupil weights from the literature, turning the resources triggered by the current Maryland school finance system into virtual pupil weights, and estimating the equity statistics.

To determine the degree of fiscal neutrality of the Maryland school finance system, i.e., the degree to which revenues per pupil are linked to local measures of fiscal capacity, we will calculate the correlation and elasticity between multiple revenue per pupil figures and multiple fiscal capacity measures, including property wealth per pupil, income per capita and some combination of property and income (examining results from our study of alternative fiscal capacity measures as requested in the RFP).

This analysis will also include an examination of the trends in school finance showing both the change in per pupil spending and the effect changes in the state's funding formula (including the implementation of the current adequacy formula) have had on these measures of school finance equity.

Increasing and Declining Enrollment Study

Lead: Robert Palaich, APA. William Hartman, Pennsylvania State University, and Justin Silverstein, APA.
Addressing RFP section 3.2.3.4.

Increases and declines in student enrollments are a driving force behind many instructional and operational costs in school systems. Changing enrollments can affect the demand for and efficiency of various aspects of school system operations. Although

enrollment changes are rarely extreme during the course of a single year, the effect of changes over time can be substantial. This enrollment study will focus on the effects of enrollment changes on local school systems. It will specifically focus on school systems with small enrollments serving large geographic areas.

This study will rely on three analyses for examining the impacts of enrollment change. The first is data analysis for all Maryland school districts over the past ten years. Data will be collected from the MSDE and will include:

- Local school system characteristics – geographic size, wealth, student demographic characteristics, population density;
- Students – enrollments, students eligible for transportation, school sizes and students transported;
- Transportation – number of vehicles, total miles traveled, transportation expenditures;
- State funding for transportation – formula and components, state aid to local school systems; and
- Other enrollment-related operating areas – facilities, staffing.

The study team will use this assimilated data to examine the cost per student for transportation and the differences that may occur in these costs for school systems with different enrollments, geography, and demographics. The analysis will also assess how changes in local school systems enrollments have impacted transportation costs for all Maryland school systems over time. There will be a particular emphasis on examining school systems with small enrollments and large geographic areas.

In addition to the analysis of transportation costs, the study team will analyze other school system operations costs, including differences for school systems with varying enrollments, geography, demographics, and enrollment changes over time. The analysis of operations costs will include maintenance and operations costs, facility utilization, staffing levels, and technology.

The second analysis in this study will review information on how enrollment changes are addressed across the country. First, this analysis will examine how other states address enrollment changes in their school funding systems. Specifically, this analysis will look at the impact of enrollment changes on transportation costs and other operational costs in other states. Second, this analysis will review the research literature on the best ways to address school system enrollment changes.

The third analysis in this study will examine the state's current transportation formula. We will use the information and results from the previous enrollment study analyses to

understand the impacts of the current funding system on Maryland school systems. The information from other states and research literature will be used to identify best practices in transportation formulas.

As a result of the three analyses conducted in this enrollment study, the study team will make recommendations on policies to address the impacts of enrollment changes on school systems' operations and transportation. Particular emphasis will be placed on creating recommendations for small local school systems with large geographic areas.

This study focuses on the impacts of enrollment changes on local school systems and does not specifically examine the impacts at the school site. The study team believes the enrollment study will help to identify the factors that might lead school systems to face school size issues, either large schools or small underutilized facilities.

Each of the three adequacy study methods will also generate estimates of the size adjustments needed for operating costs in Maryland. Furthermore, the school size study will generate estimates of the fixed and operating costs associated with schools of different sizes and configurations.

Supplemental Grants Evaluation

Lead Researcher: Robert Reichardt, APA
Addressing RFP section 3.2.3.5.

The study of Supplemental Grants will result in a recommendation as to whether these grants should continue to be funded. The Supplemental Grants program was created in Section 2 of Chapter 2 of the 2007 Special Session to mitigate the impact of an inflation freeze in the per pupil base amount in fiscal years 2009 and 2010. These grants totaled $46.6 million in FY 2014 and were awarded to nine counties.

The analysis of the Supplemental Grants will address two main questions:

1. What is the role of the grants in the equity and adequacy of the Maryland education finance structure?
2. What is the impact on local school systems that receive these grants?

The answer to the first question, regarding the role of these grants in the equity and adequacy of the state's education finance structure, will be largely addressed through the interim findings of our adequacy and equity analyses. These studies will show whether the presence of these grants increases or decreases fiscal equity among school districts or contributes to funding adequacy at the district level and from a system-wide perspective. We will also conduct an analysis of administrative documents, records and changes to state statutes, along with interviews with state policymakers, to compile a narrative of the need

and origin of the supplemental grants and current thoughts on their role and impact from a state perspective. The end result of this analysis will be a description of why the grants were initiated, current state level perspectives on their ongoing role and impact, and the effect of these grants on the school finance system in terms of equity and adequacy.

The second question will be addressed through both quantitative and qualitative data collected from the districts that received the grants and examination of historical budget allocations in those districts. First, through our qualitative data collection, including case studies, interviews or focus groups with school or district administrators in districts receiving Supplemental Grants, we will gather information on how these dollars have been used and how they have affected school and district operations. Second, we will look for impact of these grants through examination of historical budgets and resource allocations within those districts that receive supplemental grants.

Based on the results of this study and the preliminary results of our adequacy and equity studies, the project team will make a recommendation on whether the Supplemental Grants should be continued, modified or repealed. We expect that the question of Supplemental Grant funding will also be a factor in discussions about possible changes to the state's school funding formulas at the end of the study.

Regional Cost of Education Indices

Lead: Jennifer Imazeki, POA
Addressing RFP section 3.2.3.6.

An issue that gained prominence in school finance beginning in the 1970s and remains relevant today is the difference in prices that school districts face in purchasing educational resources. Districts not only purchase a different market basket of educational goods (just as individuals purchase a different market basket of goods), but districts also pay different prices for the goods they purchase. District expenditures determine quantity issues (numbers of different types of educational goods purchased, such as teachers, books, buildings, etc.), the level of quality of those goods and the cost of or price paid for each good. The variety, number, quality and price of all educational goods purchased determine school district (and/or school) expenditures. While "expenditures" are often referred to as "costs" in school finance parlance, there is a difference between these two economic terms. "Expenditure" refers to the money spent on school resources; "cost" refers to the money spent on school resources to receive a certain level of output such as student performance or to provide a certain level of service. So comparing just expenditures would not indicate differences in costs; the comparison would have to be for expenditures for the quality of services.

Prices that school districts (and/or schools) face in purchasing educational resources differ across school districts, and many states, like Maryland, have taken an interest in trying to adjust school aid allocations to compensate for geographic cost or price differences. For example, a teacher of a certain quality will probably cost more in an urban area, where generally costs of living are higher, than in nonurban areas, where generally costs of living are lower. But prices or cost variations that districts must pay for teachers of the same quality also differ among school districts because of variations in the nature of the work required, the quality of the working environment, and the characteristics of the local community. Teachers might accept marginally lower salaries if, for example, they teach four rather than five periods a day or have smaller classes, or if there are numerous opportunities for staff development, relative to other districts. Or teachers might want marginally higher salaries if there are few cultural opportunities in the surrounding community. The combination of differences in general cost of living, working conditions and the amenities of the surrounding community produces differences in prices that districts must pay for teachers of a given quality.

As previously noted, Maryland implemented a new school funding system in 2005 based on the Thornton Commission recommendations that included using a Geographic Cost of Education Index. That index, using a hedonic wage model methodology, was created using data on professional wages, non-professional wages and energy costs (Duncombe & Goldhaber, 2003). It was, however, determined that the statutory language governing the Geographic Cost of Education Index was not a legal mandate since it did not include a specific formula or funding level. After much debate, the index was first funded in fiscal year 2009 and fully funded since 2010. Under this index, 11 districts receive no adjustment and 13 receive positive adjustments due to higher than average costs. No districts receive a negative adjustment for having lower than average costs (Duncombe & Goldhaber, 2003).

Though several different approaches can be taken in constructing cost-of-education indices, the two primary ones are the hedonic approach and the comparative wage index (CWI). Whatever methodology is used, price differences can vary substantially across districts. In earlier studies of California, New York and Texas, within-state price variations ranged from 20 percent (10 percent above and below the average) in California to 40 percent (20 percent above and below the average) in Texas. And price ranges remain about the same according to more recent studies of Wyoming and Texas (e.g., Baker, 2005; Taylor, 2004). These are substantial differences. These results mean that high cost districts in California must pay 20 percent more for the same educational goods as low-cost districts. Thus, with equal per pupil revenues, high cost districts are able to purchase only 75 percent of what low cost districts can purchase. The differences in Texas are even greater. Such price differences, caused by circumstances and conditions essentially outside

the control of district decision makers, qualify as a target for adjustments in some state aid formulas.

Though the hedonic index approach dominated regional cost approaches up to the mid-1990s, a new approach to developing geographic adjustments for teacher salaries, called the "comparable wage" approach, emerged in the late 1990s. Under this new approach, the adjustment for teachers is taken from salary variations in occupations that require similar skills, competencies and job responsibilities as teaching (for a recent study, see Taylor, 2010). Taylor and Fowler (2006) used all occupations requiring a bachelor's degree or greater while Imazeki (2006) used salaries only for occupations that were similar to teaching – community college teaching, adjunct professors, nurses, psychologists, professional development trainers, etc. Imazeki's analysis showed, moreover, that the indices produced for all occupations were different from those produced only for occupations similar to teachers.

States then use various approaches to apply the price or cost-of-education index to their funding system. The preferred approach is to multiply the major elements of a school aid formula by the price index to ensure that total education revenues can purchase the same level of resources across all school districts. Thus, the price index would be applied in Maryland to the foundation expenditure level in the foundation program.

As such, including a price index in a school finance formula is relatively simple. And the National Center for Education Statistics (NCES) has recently produced comparative wage indices that can be used for all districts and all states, including Maryland (Taylor and Fowler, 2006), with updated figures for 2010 with documentation and a users' guide.

Management Plan, Location of Services and Problem Escalation Procedure

Addressing RFP sections 3.2.3.6.b, c & d

Project Management

The project team has developed a work plan to successfully complete all of the required analyses and deliverables according to the timeline specified in the RFP. Although we are working with a number of partners and subcontractors, we have designed our approach to the project to ensure that the work is completed on time and will be of high quality. This has been accomplished via two strategies.

First, we have established a clear management plan where APA has been designated as the lead organization while working collaboratively with its two primary partners. APA, and the Project Manager, Mark Fermanich, are ultimately responsible for the organization, timeliness and quality of all work conducted and products submitted by the project team. APA will conduct final reviews and have the final sign-off on all study designs, data requests and deliverables. In addition, our project Management Team, consisting of representatives of the two primary partners, APA and POA, will help to ensure a high level of coordination among the partner groups.

Second, we have strived to assign a clear line of responsibility for each of the major study components. Each study has been assigned a highly experienced lead researcher or principle investigator who is either an associate with one of the partnering organizations, or is a subcontractor reporting to one of the partnering organizations. The lead researcher/principle investigator will be responsible for overseeing the study and keeping the Management Team and the Project Manager informed about each study's progress, the need for problem resolution, or other issues that may arise.

Much of this work will be conducted remotely in various geographic locations. Our primary method of internal communication will be via email and telephone. We also have video conferencing capability and will plan face-to-face meetings as needed to coincide with site visits to Maryland. Throughout the project we will conduct bi-weekly conference calls among the major partners, and when appropriate, the project's subcontractors. At certain times during the project, we may find it necessary to increase the frequency of these calls.

Below we have developed a detailed timeline that presents the timing of key meetings, study timelines and deliverable due dates. This timeline assumes project commencement by June 30, 2014 and breaks out the major tasks and due dates through November 2016. At this point we have not incorporated the expected Post Phase II activities that run December 1, 2016 through April 30, 2017.

Project Timeline

The timeline below shows the major events during each quarter of the project. Quarters are three month periods. Phase I has four quarters between June 30, 2014 and June 30, 2015. Phase I actually lasts 17 months between July 1, 2015 and November 2016 and is broken into 5 "quarters." The timeline does not include expected Post Phase II activities that run December 1, 2016 through April 30, 2017.

The following legend shows the events shown in table

Reports	
DP	Draft Preliminary
P	Preliminary Report Due
DI	Draft Interim
I	Interim Report
DF	Draft Final Report
F	Final Report
Data Collection	
MD	Maryland based Data Collection

	Deliverables	**P1 Q1**	**P1 Q2**	**P1 Q4**	**P1 Q4**	**P2 Q1**	**P2 Q2**	**P2 Q3**	**P2 Q4**	**P2 Q5**	**P2 Q6**
		Phase I 7/14- 6/15				**Phase II: 7/15 -0-11/16**					
	I. Preliminary Studies				.						
3.2.1.10	A. Review of adequacy studies	**DP&P**									
3.2.6.1	Initial meeting	**F**									
3.2.6.2	Detailed work plan	**DF &FF**									
3.2.1	**II. Adequacy Studies**	**DP**		**MD**	**DI & I**		**MD**	**MD**	**MD**	**MD**	**F**
3.2.1.3	Identify base funding level	**DP**		**MD**	**DI & I**		**MD**	**MD**	**MD**	**MD**	**F**
3.2.1.4	Determine weights for students with special needs	**DP**		**MD**	**DI**		**MD**	**MD**	**MD**	**MD**	**F**

	Deliverables	P1 Q1	P1 Q2	P1 Q4	P1 Q4	P2 Q1	P2 Q2	P2 Q3	P2 Q4	P2 Q5	P2 Q6
		Phase I 7/14- 6/15				Phase II: 7/15 -0-11/16					
					& I						
3.2.1.5	Effects of concentrations of poverty	DP		MD	DI & I		MD	MD	MD	MD	F
3.2.1.6	Identify gaps in growth among student groups	DP		MD	DI & I		MD	MD	MD	MD	F
3.2.1.7	Correlate performance with deficits in funding	DP		MD	DI & I		MD	MD	MD	MD	F
3.2.1.8	Impacts of quality Pre-Kindergarten on school readiness and adequacy costs	DP		MD	DI & I		MD	MD	MD	MD	F
3.2.1.9	Other factors	DP		MD	DI & I		MD	MD	MD	MD	F
3.2.1.11	1. Recommendations - on formulas										
3.2.2	**III. School Size Study (School Within School)**	DP&P			DF & F						
3.2.1.1	Current school policy				DF & F						
3.2.2.1.2	Best practices in other states				DF & F						
3.2.2.1.3	Impact of school size on community		DP& P		DF & F						
3.2.2.1.4	Factors that contribute to school size ad mitigation				DF & F						
3.2.2.1.5	recommend ideal school size				DF & F						
3.2.2.1.6	Process for public input into school size standards				DF & F						
3.2.2.17	Models for create smaller schools	MD		MD	DF & F						
3.2.2.1.8	Impact on school construction plan	MD		MD	DF & F						
3.2.2.1.9	Cost and impact of zoning laws that require schools be built and ways to reduced	MD		MD	DF & F						
3.2.2.1.11	school boundaries and how affect school size	MD		MD	DF						

	Deliverables	P1 Q1	P1 Q2	P1 Q4	P1 Q4	P2 Q1	P2 Q2	P2 Q3	P2 Q4	P2 Q5	P2 Q6
		Phase I 7/14- 6/15				Phase II: 7/15 -0-11/16					
					& F						
3.2.2.1.11	Opportunities for alternative methods for creating small schools	MD		MD	DF & F						
3.2.3	**IV. Other Studies**										
3.2.3.2	A. Pre-Kindergarten - get kids Read to Learn	MD	MD	MD	MD	DF & F					
3.2.3.1	B. FRPM as proxy for economically disadvantage				DF & F						
3.2.3.3	C. Equity of finance structure and wealth calculation					DF & F					
3.2.3.4	D. Impact of enrollment changes				DF & F						
3.2.3.5	E. Supplemental Grants	MD		MD	DF & F						
3.2.3.6	F. Maryland Geographic Cost of Education Index					DP &P			DP&P	DF	F
3.2.6	**V. Project management and Technical Assistance**										
3.2.4	TA and advice on state aid formulas	TA	TA			TA	TA			TA	TA
3.2.6.3	Monthly Progress Reports	R	R	R	R	R	R	R	R	R	R
3.2.6.4	Quarterly Update	M	M	M		M	M	M	M	M	M
3.2.6.5	Stakeholder Advisory Meeting (other meetings can be scheduled during the project)	M	M	M		M	M	M	M	M	M
3.2.6.6	Presentations and Technical Assistance	TA	TA			TA	TA			TA	TA

Location of Services Provided

The work will be performed at multiple locations throughout the country with specific data collection activities within Maryland. The primary locations for work shown below:

- Headquarters for Augenblick, Palaich and Assoc. located at 1120 Lincoln Ave. Suite 1101. Denver, CO 80203
- Headquarters for Picus, Odden and Assoc. located at 4949 Auckland Ave. North Hollywood, CA 91601
- The Maryland Equity Project, Department of Teaching and Learning, Policy and Leadership, University of Maryland, College of Education at 2110 Benjamin Building, College Park, Maryland 20742

Completion of the project will not require construction of any additional facilities.

Problem Escalation Procedure

As the project lead Augenblick, Palaich and Associates will be responsible for resolving any problems with the contract. The primary contact for contact resolution will the Project Manager Mark Fermanich, Senior Associate at APA who can be contacted at 720-227-0101 or mlf@apaconsulting.net.

All problems that arise under this contract should be sent to Dr. Fermanich by e-mail clearly identifying that there is a problem and the nature of the problem. Dr. Fermanich will acknowledge receipt of the problem notification and conduct a short internal inquiry to understand the nature of the issue. He will then set up a conference call with the Departments Contract officer to discuss potential resolution to the problem. Dr. Fermanich, or his designee, will be available for this conference call within 10 days of the initial problem notification.

Because of the specialized nature of the work involved in this project there are several sub-contractors involved in the work. Dr. Fermanich will the Project Manager and works at APA. Any problem involving with APA components of the work he will deal with directly. As the project lead, APA will have access to contracting officers at each of the sub-contractors as well as project leads for each of the sub-contractors to identify the issues and appropriate mechanism for resolving any issue.

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Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.7 Experience and Qualifications of Proposed Staff

- Resumes: 15
- Letters of Intended Commitment: 8

4.4.3.7 Experience and Qualifications of Proposed Staff

The project team for the proposed Maryland funding adequacy work will be led by the Offeror, Augenblick, Palaich and Associates (APA). The other main partners will be Picus Odden and Associates (POA) and the Maryland Equity Project (MEP). There are five other subcontracting entities that will support this project: Humann Consulting, Bill Hartman of Pennsylvania State University, Early Childhood Policy Research, Leading Edge, Collaborative Communications and Time Printers. The experience and qualifications of these five subcontracting entities will be addressed in the 4.4.3.13 Subcontractors section. The leadership of this project will come from APA, along with POA and MEP.

There will be 15 key personnel (Project Manager, Principal Investigators and Lead Researchers) assigned to this project, whose roles may be different among all the different studies. For example, a Principal Investigator on one study might also be a Lead Researcher on another. There will be five support staff from APA assigned to this project who bring additional school finance and policy research experience, Amanda Brown, Kathryn Rooney, Nathan Roberson, Simon Workman and Yilan Shen. The combined APA experience and qualifications are detailed below.

Augenblick, Palaich and Associates

Augenblick, Palaich and Associates (APA) has worked on school finance issues such as the work outlined in Maryland's current RFP since 1983. We have worked in some capacity in all 50 states – conducting in-depth analyses of school finance systems, helping to create new state aid allocation systems, working with policymakers, comparing one state to others and on many other education policy topics.

No other individual or company has been involved in helping to change school finance funding in as many states. APA has not only conducted the adequacy studies in over 20 states, including for the Maryland Thornton Commission, but we have also designed school finance systems that were enacted in New Hampshire, Kentucky, Louisiana, Colorado, Mississippi, Ohio, Maryland, Kansas, New Jersey and Pennsylvania. In several states, the systems are still operating today.

Similar to the work that is outlined in the RFP, APA has analyzed, or is analyzing, the level of resources school districts need to fulfill state student performance expectations in 23 states: Alabama, Colorado, Connecticut, Delaware, Illinois, Indiana, Kansas, Maryland, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota Tennessee, and Washington, DC. APA developed the Successful Schools model and has worked to develop the Professional Judgment approach over its 16 years of implementation. The firm has analyzed the equity of school finance in most of the states listed above and others such as Kentucky, Louisiana, and Texas.

APA has proven the capacity to communicate and work effectively with all levels of state and local governments, as well as private entities. We are currently one of the partnering managers of the Central Regional Education Laboratory for the Institute of Education Sciences (IES). Mark Fermanich, Robert Palaich and Justin Silverstein from APA will lead the bulk of proposed work, with Mark Fermanich as the main project manager.

Dr. Mark Fermanich is a Senior Associate with Augenblick, Palaich and Associates (APA). Dr. Fermanich has worked extensively on state and local education issues, including education finance, education reform, and educator compensation. He has worked on school finance equity and adequacy studies in six states and has consulted for both large and small school districts on the costs of school improvement strategies, the costs of effective professional development, school-based financing systems, and school and teacher effectiveness. Prior to joining APA, Dr. Fermanich worked in education policy research for the Center for Education Policy Analysis at the University of Colorado Denver and the Consortium for Policy Research in Education (CPRE) at the University of Wisconsin-Madison, served as a professor of education policy and finance at Oregon State University in Corvallis, Oregon and Sonoma State University in Rohnert Park, California, and as an education policy analyst for the Minnesota State Senate. He also served as an administrator working on policy and budget initiatives for the Minneapolis and St. Paul school districts. Dr. Fermanich received his Ph.D. in Educational Leadership and Policy Analysis from the University of Wisconsin-Madison. He holds a Masters in Public Policy and Administration from the La Follette School of Public Affairs at the University of Wisconsin-Madison and a Bachelor's in Political Science from the University of Wisconsin-Oshkosh.

Dr. Robert Palaich is president of Augenblick, Palaich and Associates, Inc. (APA) and Associate Director of REL Central Regional Educational Laboratory. Dr. Palaich joined APA in April, 2003. The Denver-based firm has long been one of the nation's leading resources in understanding what works to increase student achievement and how to pay for it. Prior to joining APA, Palaich was the vice president of the Policy Studies and Programs division at the Education Commission of the States (ECS). He received his Ph.D. from Columbia University in political science and his bachelor's degree from the University of Notre Dame in Chemistry. In the last several years, Dr. Palaich has worked with state and local leaders in Colorado, Connecticut, Delaware, Hawaii, Kentucky, Mississippi, North Dakota, New Mexico, Pennsylvania, Virginia and West Virginia to undertake reviews of their education finance systems. He has also worked with state and local policymakers to evaluate policy in the areas of accountability, at-risk youth, early childhood education, school leadership, teacher policy, P-20 finance and school restructuring. He has written articles on education reform, at-risk youth, teacher policy, finance, district spending patterns, tax and expenditure limitations, and the costs and benefits of dual enrollment policy.

Mr. Justin Silverstein is vice president of APA and has conducted more state studies of the cost of K-12 education than anyone else in the country. He has worked on education finance issues at APA since 1997. Mr. Silverstein has worked on more adequacy studies across the nation than any other individual He has led APA's work on major school finance projects in Pennsylvania, New Jersey, Alabama, Washington, D.C, and other states. Mr. Silverstein also works closely with a number of school districts helping them think through finance and resource issues facing local education

agencies. He is experienced in helping state policymakers and other stakeholders find solutions for complex finance issues.

Dr. Robert Reichardt is a Senior Associate with APA. Dr. Reichardt is an experienced policy researcher, and conducts applied quantitative and qualitative research and evaluation to inform and support education policymaking, strategic planning, decision-making, and non-profit leadership. Technical assistance provided by Dr. Reichardt includes serving as a member of the Jefferson County School District (CO) Consortium on Performance-Based Compensation Systems, the Technical Advisory Panel for the Denver Public Schools Licensure Project, the Western Interstate Commission for Higher Technical Review Panel for High School Projections, technical advisor to Colorado School Grades, and providing staffing to the development of Colorado's first Race to the Top application. Current and recent research and evaluation projects include examining the impact of entrance requirements on student success in Colorado higher education institutions, evaluation of the ProComp teacher compensation system in Denver Public Schools, analyzing resource allocation to music education in a large district, understanding implementation of the portfolio district reform model, and evaluating a one-on-one volunteer tutoring program for reading.

Picus Odden and Associates

Lawrence O. Picus and Allan R. Odden, principal partners in Picus Odden and Associates (POA) have nearly 75 years of experience working at the state and local levels on school finance issues, and have a wealth of expertise to offer the Maryland project. The firm has worked with over three-fourths of the states and scores of school districts across the nation to design, develop, implement and evaluate school finance systems. As the developers of the evidence-based method for estimating the funding resources needed for all schools to provide every student an equal opportunity to perform at high levels, Picus Odden and Associates offers the skill and knowledge needed to help states, districts and schools identify the level and type of resources and educational strategies needed to dramatically increase student academic achievement. Since 2000, the firm has conducted school finance studies in several states, including Arizona, Arkansas, Kentucky, Maine, New Jersey, North Dakota, Ohio, Oregon, Vermont, Washington, Wisconsin, Wyoming and Texas.

Picus Odden and Associates' evidence-based model is the basis of the funding systems in Arkansas, Wyoming, Washington, North Dakota, and briefly in Ohio. The firm has conducted equity studies in 25 states and researched the implementation and impact of school finance reforms in many other states. Both Odden and Picus have served as presidents of the Association for Education Finance and Policy (formerly the American Education Finance Association), a strong indication of the high quality of the firm's work and reputation.

Dr. Lawrence O. Picus is a principal partner of Picus Odden and Associates and professor of education finance and policy in the USC Rossier School of Education. His current research interests focus on adequacy and equity in school finance as well as efficiency and productivity in the provision of educational programs for PreK-12 school children. Picus is past-president of the Association for Education Finance and Policy, and is the president of EdSource where he has been a member of the board of directors for 14 years. Picus' books include: School Finance: A Policy

Perspective (2014), coauthored with Allan Odden and widely recognized as the leading text book in the field of school finance; In Search of More Productive Schools: A Guide to Resource Allocation in Education, published by the ERIC Clearinghouse on Educational Management; and Developing Community Empowered Schools), coauthored with Mary Ann Burke. Picus is the coauthor of the Association of School Business Officials book, Principles of School Business Administration. He has published numerous articles in professional journals as well. Picus has consulted extensively on school finance issues in more than 20 states. In recent years he completed equity studies in Louisiana, Kansas, Massachusetts, and Montana and has conducted adequacy studies in Arkansas, Arizona, Kentucky, Maine, Wyoming, Wisconsin, North Dakota, Ohio, Oregon, Vermont and Washington. Picus earned his Ph.D. in Public Policy Analysis from the RAND Graduate School and hold a Bachelor's degree in economics from Reed College and Master's Degrees from the University of Chicago and the RAND Graduate School.

Dr. Allan R. Odden is Professor Emeritus of Educational Leadership and Policy Analysis at the University of Wisconsin–Madison. He also is co-director of the Consortium for Policy Research in Education (CPRE), a consortium of the University of the Wisconsin–Madison, Teachers College-Columbia University and Harvard, Northwestern, Michigan, Pennsylvania, and Stanford Universities. He is also director of Strategic Management of Human Capital in Education, a project focused on talent management in education. He formerly was professor of Education Policy and Administration at the University of Southern California (USC) and director of Policy Analysis for California Education (PACE), an educational policy studies consortium of USC, Stanford University, and the University of California–Berkeley. Odden is an international expert on education finance, school-based financing, resource allocation and use, strategic management of talent in education, educational policy, school-based management, teacher compensation, district and school decentralization, and educational policy implementation. He worked with the Education Commission of the States for a decade, serving as assistant executive director, director of policy analysis and research, and director of its educational finance center. He was president of the American Educational Finance Association in 1979–80 and received its Distinguished Service Award in 1998. He has served as research director for special state educational finance projects in Connecticut (1974–75), Missouri (1975–77), South Dakota (1975–77), New York (1979–81), Texas (1988), New Jersey (1991), Missouri (1992–93) and Vermont (2011–12).

Mr. Mike Griffith is a widely respected school finance consultant. He previously served as the Senior School Finance Analyst for the Education Commission of the States (ECS). He has worked in the field of school finance policy for the past 17 years. Mike's research has focused on the condition of state and federal budgets, the adequacy and equity of state finance formulas and promising practices in funding programs for high-need students. Mike has been part of school funding studies in Connecticut, Kansas, Minnesota, Montana, South Carolina and Vermont. While at ECS Mike has worked with policymakers in all 50 states to reshape their school funding systems with the goal of improving student achievement. Mike is an expert resource to national news media and has been quoted over 250 times by such outlets as: CNN, Education Week, NBC Nightly News, National Public Radio and The New York Times.

Dr. Michael Goetz is an Education Finance Consultant based in Cincinnati, Ohio. He has worked on school finance adequacy studies in Arizona (2003-04), Arkansas (2005-06), North Dakota (2007-08), Texas (2012), Washington (2005-06), Wisconsin (2005-06), and Wyoming (2005-06). Michael has also performed analyses of school-based resource allocation and restructuring in Hawaii, Missouri, New Jersey, Washington, Wisconsin, and Wyoming. Additionally, Michael has worked with the Foundation for Child Development (FCD) to evaluate the cost of early childhood education. Before focusing solely on school finance policy, he was a Researcher with the Consortium for Policy Research in Education (CPRE) at the University of Wisconsin—Madison. Prior to joining CPRE, Michael managed K-8 educational centers for Score Learning, Inc. in New York and taught middle school math and science in Kansas City. He received a B.A. in Educational Studies from Washington University in St. Louis and a Ph.D. in Educational Leadership and Policy Analysis at University of Wisconsin—Madison. Michael received a Wisconsin-Spencer Doctoral Research Program Fellowship, a dissertation grant from the American Educational Research Association (AERA), and the American Education Finance Association New Scholar Award. He is currently coordinating the work of Picus Odden and Associates in Kentucky.

Dr. Anabel Aportela's work in K-12 public education policy and research is focused on school finance, human resource management, student assessment, school accountability, and data-driven decision-making. Her primary interest is in understanding the connection between resource allocation and instructional effectiveness. Anabel has extensive experience working on state-level policy projects, including school finance projects in Wisconsin, Wyoming, Arkansas, North Dakota, Illinois, Ohio, and Arizona. In Arizona, she has recently created a set of policy recommendations for the Arizona Business & Education Coalition's School Finance Reform Initiative whose goal is to redesign Arizona's school finance system so that it supports increasingly higher levels of student achievement. Prior to her work in school finance, Anabel spent seven years at the Arizona Department of Education where she served as Director of Research & Policy, responsible for the analysis and reporting of student assessment and school accountability results. During this time, she co-developed the Arizona Measure of Academic Progress, the state's first value-added approach to measuring student progress and also led the design of the state's first school accountability system. Anabel holds a Ph.D. in Educational Leadership and Policy Analysis from the University of Wisconsin-Madison, as well as a M.A. in Education Policy and a B.A. in Public Policy and from Stanford University.

Dr. Jennifer Imazeki is a Professor of Economics at San Diego State University where she conducts research in the economics of K-12 education, including work on school finance reform and adequacy and teacher labor markets. She received her M.A. and Ph.D. in economics from the University of Wisconsin-Madison, where she also worked as a researcher for the Consortium for Policy Research in Education and received a Spencer Dissertation Fellowship. She has published several articles on education policy in a range of professional journals, books and policy outlets. Dr. Imazeki conducted an analysis of the costs of an adequate education in Texas for the plaintiffs in *West Orange-Cove et al v. Neeley et al*, and has published several papers related to that work. In Florida, she provided expert assistance on teacher cost adjustments to the plaintiffs in *Miami-Dade et al v. King et al.* She has also completed studies on adequacy and/or teacher costs in Wisconsin, Illinois, Washington and California. In 2008, she assisted California Assemblywoman Julia Brownley

to develop legislation for comprehensive school finance reform, and has been working on a study of California's categorical flexibility provisions. She is an Associate Editor for The American Economist, and the managing editor for Conditions of Education in California, the blog for Policy Analysis in California Education (PACE).

Maryland Equity Project at the University of Maryland

The MEP is uniquely positioned to contribute to the success of this Maryland study. Recent policy briefs and reports published by MEP demonstrate relevant knowledge about issues surrounding educational adequacy in Maryland. The policy and data briefs on early education outlined how early education policy has evolved in Maryland and examined pre-school enrollment trends. In an analysis of demographic changes in public school enrollment, MEP identified where growth in enrollment is taking place and how the racial and economic makeup of districts and schools is changing. Other briefs/reports examined access to college and financial aid policies, disparities in graduation rates and student achievement and community-school partnerships, among other issues. MEP will draw on its expertise in these and related areas, as well as its rich knowledge of the Maryland education system, in contributing to the Maryland Adequacy Study.

Three MEP staff and affiliates will provide the major contributions to the proposed study – Gail Sunderman, Director of MEP, Robert Croninger, faculty advisor to MEP and Jennifer Rice, MEP research affiliate. Each has more than twenty years of experience doing research on education policies and practices, including how policies and practices influence the distribution of educational opportunities, local capacity to improve schools, accountability systems and education finance.

Dr. Gail Sunderman is the director of the Maryland Equity Project and a senior research scientist with the Department of Teaching and Learning, Policy and Leadership in the College of Education at the University of Maryland. As the director of MEP, Dr. Sunderman has primary responsibility for establishing the project's research agenda, coordinating staff and conducting policy seminars. Her research interests include the role of the state in education and the impact of policy on the educational opportunities of low income and minority students. Prior to joining University of Maryland, she directed the Mid-Atlantic Equity Center at The George Washington University where she spearheaded the development of the Equity Planning Tool, a research-based instrument designed to assist districts in assessing the extent to which existing policies and practices promote the equitable distribution of educational opportunities. At the Harvard Civil Rights Project (CRP), she was lead researcher on a five-year study examining the implementation of the No Child Left Behind Act of 2001 and how this legislation influenced educational change in states and local school districts. Dr. Sunderman has served as expert consultant on educational disparities for the U.S. Department of Justice and other organizations. She is editor of *Charting Reform, Achieving Equity in a Diverse Nation* (2013) and *Holding NCLB Accountable: Achieving Accountability, Equity, & School Reform* (2008). She is also a coauthor of *NCLB Meets School Realities: Lessons from the Field* (with James S. Kim and Gary Orfield). Dr. Sunderman has extensive experience conducting qualitative research in schools and communities, including case studies, individual interviews, and focus groups.

Dr. Robert G. Croninger is the Faculty Advisor for the Maryland Equity Project. He is the associate chair in the Department of Teaching and Learning, Policy and Leadership in the College of

Education and an adjunct associate professor in the Joint Program on Survey Methods at the University of Maryland, College Park. He is also a faculty fellow with the Harvard Strategic Data Project, where he works with school leaders in developing analytics and evidence-based policies and practices to improve educational outcomes. As the faculty advisor, Dr. Croninger assists the director in developing the project's research agenda and conducting research. Prior to taking a position at the University of Maryland, Dr. Croninger was an associate director for the Programs for Educational Opportunity at the University of Michigan, where he worked with school districts and communities to implement desegregation plans and to address race, gender, and language-based inequities in schools. His most recent research focuses on the challenges of studying teaching and identifying instructional practices that affect learning, particularly for students who have been historically disadvantaged in elementary and secondary schools. His latest publications include "Equitable Public Education: Getting Lost in the Shuffle" with Kathleen Hoyer in *Charting Reform, Achieving Equity in a Diverse Society*, edited by Gail Sunderman, and a special issue of *Teachers College Record*, entitled "Researching quality in teaching: Enduring and emerging challenges" edited with Linda Valli and Marilyn Chambliss. His has extensive expertise in research methods, including case study, focus groups, and statistical analyses.

Dr. Jennifer King Rice is a research affiliate with the Maryland Equity Project. She is a professor in the Department of Teaching and Learning, Policy and Leadership and the Associate Dean for Graduate Education and Faculty Affairs in the College of Education. As a research affiliate with MEP, she participates in areas of research that benefit from her expertise in the economics of education, school finance, teacher policy, and high-stakes accountability systems. Prior to joining the faculty at the University of Maryland, Dr. Rice was a researcher at Mathematica Policy Research in Washington, D.C. Her research draws on the discipline of economics to explore education policy questions concerning the efficiency, equity, and adequacy of U.S. education systems. Her current work focuses on teachers as a critical resource in the education process. She has published more than 50 articles and book chapters and serves on the editorial boards of *Educational Evaluation and Policy Analysis* and *Education Finance and Policy*. Her authored and edited books include *Fiscal Policy in Urban Education*; *High Stakes Accountability: Implications for Resources and Capacity;* and *Teacher Quality: Understanding the Effectiveness of Teacher Attributes*, winner of the 2005 American Association of Colleges for Teacher Education book award. As a national expert in education finance and policy, Dr. Rice regularly consults with numerous policy research organizations and state and federal agencies. In 2003, she served as an expert advisor on the development of a geographic cost of education index for the Maryland State Department of Education. She is a past president of the Association for Education Finance and Policy and spent a recent sabbatical leave as a Visiting Fellow at the Urban Institute. She has extensive expertise in both quantitative and qualitative methods, including cost analysis, case study and focus groups.

Organizational Chart

The project will be led and directed by the Project Manager, Mark Fermanich. Dr. Fermanich will be the main point of contact for the State of Maryland during the implementation of the project. He will be assisted by a management team consisting of himself along with Larry Picus and Bob Palaich. The Management Team is responsible for working with the MSDE and Stakeholder

Advisory Group as well as the coordination, integration and timely completion of all tasks within the project.

The three main studies are led by Principal Investigators. The largest study area is the adequacy study, which will be jointly led by a team of three Co-Principal Investigators: Justin Silverstein, Larry Picus and Mark Fermanich. The Principal Investigator for the school size study will be Cheryl Humann. The Principal Investigator for the other studies will be Justin Silverstein. Component studies and approaches will have Lead Researchers as described in the table below and organization chart.

The organizational chart describes the structure we will use for implementing this project and summarizes duties for key personnel (4.4.3.7). The table below is in response to expectations outlined in sections 3.2.5.1 and 4.4.3.7 of the RFP. This table only describes the Lead Researchers and authors, and not all personnel who will be working on studies and deliverables. It is important to note that collaboration will occur across the project team and leaders of one study will provide support in completing other studies. Equally important, time shown is estimated as a percentage of their total working time during the project period.

Organizational Chart: Key Personnel, Duties, Studies and Time on Deliverables (in response to 3.2.5.1 and 4.4.3.7)

Project Member	Project Title	Percent of Time on Project	Duties	Studies	Deliverables and Percent of Time per Deliverable
Mark Fermanich	Project Manager/ Management Team	25%	Overall Project Manager and point of contact for Maryland Department of Education. Member of Management Team. Principal Investigator for adequacy study, Lead Researcher for successful schools approach and literature review.	3.2.1 and 3.2.6.	3.2.7.1.4., 3.2.7.1.10, 3.2.7.1.12, 3.2.7.1.15 and 3.2.7.1.16 (shared with Picus, Silverstein and Odden) (12.5%); 3.2.7.1.7 (5%),
Bob Palaich	Principal Investigator/ Management Team	10%	Coordination, integration and timely completion of project. Lead Researcher of the prekindergarten study.	3.2.3.2	3.2.7.1.9 (6%)

Justin Silverstein	Principal Investigator	20%	Principal Investigator for adequacy studies, Principal Investigator for other studies, Lead Researcher for the professional judgment approach.	3.2.1 and 3.2.3	3.2.7.1.4., 3.2.7.1.10, 3.2.7.1.12, 3.2.7.1.15 and 3.2.7.1.16 (shared with Fermanich, Picus and Odden) (15%)
Robert Reichardt	Lead Researcher	10%	Lead Researcher for the Supplemental Grants evaluation.	3.2.3.5	3.2.7.1.6 (8%)
Larry Picus	Principal Investigator/ Management Team	20%	Coordination, integration and timely completion of project. Principal Investigator for adequacy studies, Lead Researcher of the equity analysis.	3.2.1 and 3.2.3.3	3.2.7.1.4., 3.2.7.1.10, 3.2.7.1.12, 3.2.7.1.15 and 3.2.7.1.16 (shared with Fermanich, Silverstein, and Odden) (15%)
Allan Odden	Lead Researcher	10%	Lead Researcher for the evidence-based approach.	3.2.1	3.2.7.1.4., 3.2.7.1.10, 3.2.7.1.12, 3.2.7.1.15 and 3.2.7.1.16 (shared with Fermanich, Picus, and Silverstein) (8%)
Anabel Aportela	Lead Researcher	10%	Lead Researcher for the review of state adequacy studies.	3.2.1.10	3.2.7.1.1 (8%)
Michael Griffith	Lead Researcher	10%	Lead Researcher supporting evidence-based approach and equity analysis.	3.2.1.3 and 3.2.3.3	3.2.7.1.4 (8%)
Michael Goetz	Lead Researcher	10%	Lead Researcher supporting evidence-based approach and equity analysis.	3.2.1.3 and 3.2.3.3	3.2.7.1.4 (8%)
Jennifer Imazecki	Lead Researcher	7.5%	Lead Researcher for the Regional Cost of Education Index.	3.2.3.6	3.2.7.1.13 and 3.2.7.1.14 (6%)
Gail Sunderman	Lead Researcher	10%	Lead Researcher for the identifying alternative proxies for economically disadvantaged students.	3.2.3.1	3.2.7.1.8 (8%)

Bob Croninger	Lead Researcher	10%	Case studies of improving schools and schools closing the achievement gap and identifying alternative proxies for economically disadvantaged students.	3.2.1.2	3.2.7.1.4 (8%)
Jennifer King Rice	Lead Researcher	10%	Case studies of improving schools and schools closing the achievement gap.	3.2.1.2	3.2.7.1.4 (8%)
Cheryl Humann	Principal Investigator	20%	Principal Investigator school size study.	3.2.2	3.2.7.1.2, 3.2.7.1.3, 3.2.7.1.3 and 3.2.7.1.5 (15%)
Bill Hartmann	Lead Researcher	10%	Lead Researcher for the impact of enrollment.	3.2.3.4	3.2.7.1.11 (8%)

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Anabel Aportela	Proposed Job Title: Lead Researcher
Contractor:	Lawrence O. Picus and Associates; DBA Picus Odden and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Wisconsin—Madison / Madison / WI	Ph.D.	2010	Educational Leadership and Policy Analysis
Stanford University / Stanford / CA	M.A.	1995	Educational Administration and Policy Analysis
Stanford University / Stanford / CA	B.A.	1993	Public Policy

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Center for Student Achievement Director of Research & Evaluation 2012-present Phoenix, AZ Robert DiBacco	Lead the Center's research efforts to inform education policy in the state through the investigation and reporting of the impact or potential impact of key education policies, particularly in the areas of school finance and school accountability.
Picus Odden & Associates Associate 2006-present Multiple Locations Larry Picus	Conduct school visits and interviews with school and district personnel to investigate the u e of resources in schools. States include Maine, North Dakota, and Arkansas. Build and trouble shoot electronic school funding models to simulate the impact of the Evidence-Based Model in various states and policy contexts. Projects include Maine, Texas, and Ohio. Perform school expenditure analyses using statewide school finance expenditure databases. Projects inclu de Arkansas and Wyoming.
Arizona Business & Education (ABEC) 2008-2010 Phoenix, AZ Susan Carlson	Managed the ABEC's School Finance Reform Initiative (SFRI) aimed at redesigning Arizona C's school finance system so that it supports increasingly higher levels of student learning. Con Developed policy proposals and facilitate their discussion among stakeholders and policymakers. Conducted analyses of the current Arizona school finance system and prese nt results to education stakeholders and policymakers. Supervised Project Analyst in the development of an electronic simulation model of Arizona's school finance formula in ord er to simulate the costs of the SFRI.
Strategic Management of Human Capital, a Project of the Consortium for Policy Research in Education Research Staff 2008 Madison, WI Allan Odden	Conducted case studies of teacher recruitment, preparation and professional developme nt organizations.

Consortium for Policy Research in Education, School Finance Project Project Assistant 2005-2008 Madison, WI Allan Odden	Built an electronic simulation model of Wisconsin's school finance formula in order to simulate the costs of all possible scenarios in the design of Wisconsin's Study of School Finance Adequacy. Provided research support for the Wisconsin School Finance Network, a group of education stakeholders seeking to redesign the state's school finance formula. Conducted research on various school finance topics, primarily school finance adequacy, teacher compensation, and the link between resource allocation and student achievement.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2012-present	Director of Research & Evaluation	Center for Student Achievement	
2006-present	Associate	Picus Odden & Associates	
2011-2012	Resource & Sustainability Administrator	Rewarding Excellence in Instruction & Leadership (REIL) Grant Maricopa County Education Service Agency	Began job at Center for Student Achievement
2008-2010	Consultant	Arizona Business & Education Coalition	contract ended
2009-2010	Consultant	City of Phoenix, Communities Learning in Partnership	contract ended
2009-2010	Consultant	National-Louis University	contract ended
2008	Research Staff	Strategic Management of Human Capital, a Project of the Consortium for Policy Research in Education	Finished Ph.D. coursework and moved to AZ
2005-2008	Project Assistant	Consortium for Policy Research in Education, School Finance Project	Finished Ph.D. coursework and moved to AZ
2003 – 2004	Director of Research	Dysart Unified School District	Began Ph.D.
2002 - 2003	Research & Evaluation Officer	Rodel Charitable Foundation of Arizona	Began job at Dysart Unified School District
2001 – 2002	Director of Research & Policy	Arizona Department of Education	Began job at Rodel Foundation
1999 - 2001	Research Associate	Research and Policy, Arizona Department of Education	New position with same organization
1997 - 1999	Program Specialist	Research & Evaluation, Arizona Department of Education	New position with same organization
1995 - 1997	Research Analyst	Research & Evaluation, Arizona Department of Education	New position with same organization

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
Robert DiBacco	Chief Operating Officer	Arizona Charter Schools Association and Center for Student Achievement	602-944-0644 x 305 robert@azcharters.org
David Garcia	Associate Professor	Mary Lou Fulton Teachers College, Arizona State University	602-828-0657 david.garcia@asu.edu
Susan Carlson	Executive Director	Arizona Business & Education Coalition	602-264-8436 usan@azbec.org
Allan Odden	Professor	Educational Leadership and Policy Analysis, University of Wisconsin-Madison	(608) 263-4260 arodden@facstaff.wisc.edu

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Robert G. Croninger	Proposed Job Title
Contractor:	Maryland Equity Project	Lead Researcher

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Michigan/ Ann Arbor/ MI	Ph.D.	1997	Educational Studies
College of William and Mary/ Williamsburg/ VA	MA	1976	Sociology
Valparaiso University/ Valparaiso/ IN	BA	1973	Sociology

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

University of Maryland Assistant/Associate Professor and Associate Chair 2009– Present College Park, MD	Taught advanced courses on educational equity, research design, and statistical methods, including multilevel modeling. Conducted and published research on effective instructional practices of elementary school teachers with students from at-risk backgrounds; conducted and published research on effective/successful schools with students from at-risk backgrounds.
University of Michigan, Associate Director of Race Equity/Senior and Associate Research Assistant, Programs for Educational Opportunity, 1973-2009.	Conducted and published research on at-risk students; identified successful instructional programs with students in desegregated schools, including students from low-income families, language minority students and African American students; coordinated technical assistance to equity-related educational programs in Michigan, Wisconsin, Illinois, Minnesota, Indiana, and Ohio.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2009 – Present	Assistant/Associate Professor and Associate Chair	University of Maryland	
1973 – 2009	Associate Director of Race Equity/Senior and Associate Research Assistant	Programs for Educational Opportunity, University of Michigan	Moved to University of Maryland

D. References

List persons the State may contact as employment references

N/A

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Mark L. Fermanich	Proposed Job Title: Project Manager
Contractor:	Augenblick, Palaich, and Associates, Inc.	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Wisconsin / Madison / WI	Ph.D.	2003	Educational Leadership and Policy Analysis
University of Wisconsin / Madison / WI	MA	1982	Public Administration
University of Wisconsin / Oshkosh / WI	BS	1979	Political Science

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Augenblick, Palaich, and Associates, Inc. Senior Associate August 2013 – Present Denver, Colorado Robert Palaich	Conduct policy research and evaluation in areas of education policy, finance, finance adequacy and equity, reform, and teacher compensation and effectiveness. Serve as principal investigator on small- to large-scale research and evaluation projects. Prepare and present reports, both technical and academic for clients, policymakers and academic journals. Advise and provide technical assistance to state and local education policymakers.
Oregon State University Assistant Professor September 2011 – June 2013 Denver, Colorado Darleen Russ-Eft	Teach courses, both campus-based and online, in the areas of education policy, finance and politics across higher education leadership and K-12 graduate programs in the College of Education. Maintain active research agenda, serve on Master's and Doctoral committees and engage in service activities.
University of Colorado Denver Research Faculty October 2009 – September 2011 Denver, Colorado Paul Teske	Teach courses, both campus-based and online, in the areas of education policy, finance and politics across higher education leadership and K-12 graduate programs in the College of Education. Maintain active research agenda, serve on Master's and Doctoral committees and engage in service activities.
St. Paul Public Schools Compensatory Education Coordinator October 1997 – September 1998 St. Paul, MN Laurin Cathey	Coordinated all activities pertaining to district and site-based compensatory programs for disadvantaged and at-risk students. • Reviewed and approved expenditures for $40 million compensatory education program. • Assisted school sites with budget, administration, best practice, and program implementation issues. • Assumed leadership role in district site-based management initiative. • Provided troubleshooting in areas of budget and state policy.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
August 2013 – Present	Senior Associate	Augenblick, Palaich, and Associates, Inc.	
September 2011 – June 2013	Assistant Professor	Oregon State University	New opportunity
October 2009 – September 2011	Research Faculty	University of Colorado Denver	New position at Oregon State University

D. References

List persons the State may contact as employment references

See submission to RFP section 4.4.3.9

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Michael Goetz	Proposed Job Title: Lead Researcher
Contractor:	Lawrence O. Picus and Associates; DBA Picus Odden and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Wisconsin-Madison / Madison / WI	Ph.D.	2012	Educational Leadership and Policy Analysis
Washington University / St. Louis / MO	B.A.	1996	Educational Studies

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Research on Social and Educational Change (RSEC) Executive Director May 2003 - present Georgetown, KY Allen Odden	Work with policymakers and academics to analyze fiscal data and develop models for PK-12 school finance adequacy in Arkansas, Arizona, Kentucky, Maine, North Dakota, Texas, Washington, and Wyoming. Moderate professional judgment panels for the recalibration of the Maine, Wyoming, and North Dakota school funding models. Analyze school-level resource strategies in Arkansas, Maine, North Dakota, Washington, and Wyoming. Develop a cost framework for preschool education and research effective district-level resource reallocation tools. Clients include Bill and Melinda Gates Foundation, Council for Better Education, Foundation for Child Development, National Academies, Picus Odden & Associates, and several legislative and gubernatorial committees.
University of Wisconsin Instructor Sept. 2008 - May 2009 Madison, WI Allen Odden	Taught graduate-level courses in Financing Elementary and Secondary Education. Developed syllabi, delivered lectures, and facilitated discussions on issues of school finance at the national, state, district, and school levels.
Consortium for Policy Research in Education (CPRE) Research Staff May 2003 - Sept. 2008 Madison, WI Allen Odden	Analyzed the correlation between school fiscal resources, teacher practice, and student academic growth. Determined the level and distribution of resources in schools undergoing comprehensive school reform. Designed school finance adequacy models for the Wisconsin public school finance system. Researched school level resource allocation in five states. Built a national and state level model of school finance. Reviewed human resource structures of alternative teacher and administrator programs, including TFA, TNTP, and New Leaders.
Score Learning, Inc. Project Manager August 2000 - July 2002 Oakland, CA	Designed effective technology and organizational structure for on-line curriculum delivery and teaching system. Produced on-line academic assessments for students in grades 2-8 in reading, language arts, and mathematics. Developed and implemented web-based billing system for educational centers.
Score Educational Centers Senior Director May 1997 - August 2000 New York City, NY	Managed educational centers that use computer-based and traditional tutoring methods. Supervised and provided professional development for nine full-time and thirty part-time staff members. Collected and evaluated qualitative and quantitative indicators of student and center performance.

Summerbridge Program Manager and Teacher June 1994 – May 1997 Germantown, PA	Managed school-year enrichment program by conducting needs assessment, evaluation, program design, and professional development. Produced written evaluations for students, parents, teachers, and school officials. In the first two summers, taught math, physics, and social studies to middle school students for Kansas City Summerbridge.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
May 2003-present	Executive Director	Research on Social and Educational Change (RSEC)	
Sept. 2008- May 2009	Instructor	University of Wisconsin Department of Educational Leadership and Policy Analysis	Left to move to new city to finish dissertation
May 2003- Sept. 2008	Research Staff	Consortium for Policy Research in Education (CPRE)	Took position as Instructor University of Wisconsin
August 2000 - July 2002	Project Manager	Score Learning, Inc.	Left to attend graduate school
May 1997 - August 2000	Senior Director	Score Educational Centers	Left to work at Score Learning headquarters
June 1994 – May 1997	Program Manager and Teacher	Summerbridge [Breakthrough Collaborative]	Left to begin work with Score Learning

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
Allan Odden	Professor Co-Director	Educational Leadership and Policy Analysis; Consortium for Policy Research in Education in the Wisconsin Center for Education Research University of Wisconsin-Madison	(608) 263-4260 arodden@facstaff.wisc.edu
Geoffrey Borman	Professor	Educational Leadership and Policy Analysis; Educational Policy Studies, and Educational Psychology University of Wisconsin-Madison	(608) 263-3688 gborman@education.wisc.edu
Carolyn Kelley	Professor	Educational Leadership and Policy Analysis University of Wisconsin—Madison	(608) 263-5733 kelley@education.wisc.edu

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Michael Griffith	Proposed Job Title: Lead Researcher
Contractor:	Lawrence O. Picus and Associates; DBA Picus Odden and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
Trinity College / Dublin / Ireland	M.Ed.	2006	Educational Management
The Ohio State University / Columbus / OH	MPA	1993	Government Finance
Michigan State University / Lansing / MI	B.A.	1989	Political Philosophy

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Independent School Finance Consultant January 2013 – Present Denver, Colorado	Working with clients on a variety of education policy topics including: Early learning funding, the current condition of state education budgets and the adequacy and equity of school funding in states. Current clients include: Education Commission of the States, the Illinois State Board of Education, the Maine legislature, Pew Charitable Trusts and Lawrence Picus & Associates.
Education Commission of the States Senior Policy Analyst April 2000 – December 2012 Denver, Colorado Kathy Christie	Managed ECS's education finance efforts, produced policy briefs, reports, presentations and other documents that are published to the ECS website and distributed to educators and legislators nationwide. While at ECS I oversaw project and proposal budgets ranging from $15,000 to over $1 million. In addition to working with policymakers and their staff in all 50 states I worked with national policy organizations that include: the National Center on Time and Learning, Pearson Publishing, Pew Center on the States and multiple state government clients. I testified to state legislatures or governors' commissions in twenty-five states on educational issues, including: charter schools, education funding, school choice, virtual learning and vouchers. Worked as part of a team on school funding adequacy and equity studies in Connecticut, Kansas, Maryland, Missouri, Montana, South Dakota and Vermont. During these studies I conducted research on various education topics, including: the condition of state budgets, the adequacy and equity of state finance formulas, state funding of early-learning programs and promising practices in funding programs for high-need students. I was quoted over 250 times by numerous national media outlets, including: CNN, Education Week, NBC Nightly News, National Public Radio and The New York Times. In addition, I presented on various education policy issues to numerous local, state and national organizations, including: Council of State Governments, Education Writers Association, League of Women Voters, National Association of Latino Elected & Appointed Officials, National Conference of State Legislatures and National School Boards Association.
Augenblick & Myers – Education Policy Consultants Policy Analyst August 1999 – March 2000 Denver, Colorado John Myers	Worked on research projects in areas that included adequacy in school funding, school district consolidation and special education funding reform in order to assist policymakers in Kansas, Minnesota and South Carolina.

Michigan State Senate Policy Analyst January 1994 – June 1999 Lansing, Michigan Nancy Green	Staffed the Michigan Senate Taxation/Finance and Capital Construction committees. My committee work required me to draft legislation dealing with taxation, K-12 and higher education funding, bonding and capital construction. I assisted in designing Request for Proposals and Request for Qualifications for state projects. During my time with the legislature I worked with state and national groups to draft or amend legislation, these groups included: AFL-CIO, American Association of School Administrators, Michigan Chamber of Commerce, National Association of State Boards of Education, National Education Association and state universities and community colleges.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
January 2013 – Present	Consultant	Independent school finance consultant	
April 2000 – December 2012	Senior Policy Analyst	Education Commission of the States	New opportunity
August 1999 – March 2000	Policy Analyst	Augenblick & Myers – Education Policy Consultants	New position at Education Commission of the States

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
Kathy Christie	Vice President	Education Commission of the States	(303) 299-3613 kchristie@ecs.org
Nicki Bazer	General Counsel	Illinois State Board of Education	(312) 814-2223 nbazer@isbe.net
Allan Odden	Professor Co-Director	Educational Leadership and Policy Analysis; Consortium for Policy Research in Education in the Wisconsin Center for Education Research University of Wisconsin—Madison	(608) 263-4260 arodden@facstaff.wisc.edu

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	William T. Hartman	Proposed Job Title: Lead Researcher
Contractor:	Subcontractor to Augenblick, Palaich, and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
Stanford University / Palo Alto / CA	Ph.D.	1979	Administration and Policy Analysis
Harvard University/ Boston/ MA	MBA	1967	Marketing and Control
University of Florida/ Gainesville/ FL	BME	1965	Mechanical Engineering

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Pennsylvania State University – Center for Total Quality Schools, Executive Director 1986 – Present University Park, PA	Teach courses, both campus-based and online, in the areas of education finance, school district budgeting, and decision making in educational leadership and K-12 graduate programs in the College of Education. Maintain active research agenda in school finance, serve on Master's and Doctoral committees, and engage in service activities.
Educational Finance Decisions, LLC President, 2008 – Present State College, PA	Provide consulting and technical assistance to school districts in areas of multi-year budget planning, achieving financial stability in difficult economic times, and financial analyses for labor negotiations. Serve as principal investigator on research and evaluation projects. Prepare and present reports, both technical and academic for clients, policymakers and academic journals. Advise and provide technical assistance to state education policymakers regarding educational funding.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
1986 – Present	Professor	Pennsylvania State University	NA
2008 – Present	President	Educational Finance Decisions, LLC	NA

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
Gerald LeTendre	Department Head	Pennsylvania State University	(814) 863-0619

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Cheryl K. Humann	Proposed Job Title: Principal Investigator
Contractor:	Augenblick, Palaich, and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Phoenix / Lakewood / CO	Masters of Science	2007	Computer Information Systems
University of North Dakota / Grand Forks / ND	Bachelor of Science	1987	Mechanical Engineering

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Jefferson County Public Schools Facilities Department Executive Director 2004-2013 Lakewood, CO Dr. Cindy Stevenson	Leadership of department responsible for all facilities related services: planning and property management, design and construction, maintenance, environmental and custodial services. JeffCo Schools is the largest school district in Colorado with over 85,000 students, 12.1 million square feet in 160+ facilities with 3100 acres. Led the 2009 Facilities Usage Committee and the initial development of a long-range District Master Plan in 2009 and annual updates thereafter. Successfully completed delivery of six-year $485M 2004 Capital Improvement Program (CIP) consisting of 350 projects at 130 different sites. Responsible for all budgeting, accounting and consultant and contractor procurement. Managed and reported on 3 separate funding sources. Led Citizen's Oversight Committee and Capital Asset Advisory Committee.
Jacobs Facilities Inc. Program Director 1994-1999 Multiple Locations Don Haydon	Responsible for program setup and operations of 5-year, $210M Alternative Bonding Program for Minneapolis Public Schools. Planning team member that developed District IAQ Standards. Responsible for planning and design phase management of $58M Capital Construction Program for the State of Montana Department of Administration; Helena, MT.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2013-Present	Owner	Humann Consulting, LLC	
2004-2013	Executive Director	Jefferson County Public Schools Facilities Department	To start own business
2001-2004	Manager of Projects / Operations Support	Jacobs Facilities Inc.	New opportunity

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
N/A			

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Jennifer Imazeki	Proposed Job Title: Lead Researcher
Contractor:	Lawrence O. Picus and Associates; DBA Picus Odden and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Wisconsin - Madison / Madison / WI	Ph.D.	2000	Economics
University of Wisconsin - Madison / Madison / WI	M.S.	1997	Economics
Pomona College / Claremont / CA	B.A.	1993	Economics

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

San Diego State University Professor 2000 – present San Diego, CA	Serve as full professor in the Department of Economics. Work includes teaching courses in applied microeconomics, data analysis and economics education. Conduct research on school finance and teacher labor markets.
Policy Analysis for California Education (PACE) Conditions of Education in California (blog) Managing editor 2012 – present	Solicit and edit summaries of research relevant to education policy in California for weekly online publication.
Miscellaneous Consulting 2000-present	Have served as consultant and advisor on several projects and court cases related to school finance, including advising Assemblywoman Julia Brownley to develop legislation to reform California school finance; providing expert testimony in Texas and Florida; and estimating geographic cost indices for adequacy studies in Washington and Wisconsin.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
August, 2000 to present	Professor of Economics	San Diego State University	

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
N/A			

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Allan Odden	Proposed Job Title: Lead Researcher
Contractor:	Lawrence O. Picus and Associates; DBA Picus Odden and Associates	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
Brown University / Providence / RI	B.S.	1965	Aerospace Engineering
Union Theological Seminary / New York / NY	M. Div.	1969	Theology
Teachers College, Columbia University	M.A.	1971	Mathematics Education
Columbia Teachers College / New York / NY	Ph.D.	1975	Ed Policy, School Finance

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Picus Odden & Associates Senior Partner 2000-Present Madison, WI	Since 2000, Odden as principal partner in Picus Odden and Associates has directed adequacy studies in Arkansas, Arizona, Kentucky, Maine, New Jersey, North Dakota (2007 and 2014), Ohio, Vermont, Washington, Wisconsin and Wyoming (2005 and 2010), mostly for state legislatures. Assessed school finance equity, adequacy, productivity, alternative wealth measures, regional cost indices, key elements of schools that produced improvements in student achievement and the linkage back to the school improvement theory embedded in the evidence based model. Sponsored evidence-based studies, cost function, professional judgment and successful schools approaches. Odden has also helped districts develop strategic plans to improve student learning in Little Rock, Arkansas and Beaverton, Oregon.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
8/1993-5/2014	Professor	University of Wisconsin-Madison	Retired
8/1984-9/1993	Professor	University of Southern California-LA	Moved to University of Wisconsin-Madison
6/1975 to 8/1984	Various Positions, including director of the Education Finance Center	Education Commission of the States	Left for University of Southern California

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email
Claire Hertz	Chief Financial Officer	Beaverton School District, Beaverton, Oregon	503-591-4262 Claire_Hertz@beavton.k12.or.us
Jim Argue	Former State Senator; Co-Chair; President; Co-Chair	Little Rock School District Strategic Planning Commission; United Methodist Foundation; Arkansas Joint Legislative Committee on Education Adequacy	501-664-8632 jargue@umfa.org
Dave Nelson	School Finance Manager	Wyoming Legislative Service Office	307-777-7881 Dave.Nelson@WYOLEG.GOV
Steve Klein	Director	Vermont Legislative Joint Fiscal Office	802-828-5769 SKLEIN@leg.state.vt.us
Lucille E. Davy	Former Commissioner of Education; Senior Advisor	James B. Hunt Jr. Institute for Educational Leadership and Policy, The Hunt Institute	609-273-3128 lucille.davy@gmail.com

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Robert M. Palaich	Proposed Job Title	Principal Investigator
Contractor:	Augenblick, Palaich, and Associates, Inc.		

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Complete	Field Of Study
Columbia University / New York / NY	Ph.D.	1981	Political Science
Columbia University / New York / NY	M.Phil.	1978	Political Science
Teachers College, Columbia University / New York / NY	M.A.	1974	Educational Administration
University of Notre Dame / South Bend / IN	B.A.	1973	Chemistry

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Augenblick, Palaich, and Associates, Inc. President (2011 - Present); Vice President (2003-2011) 2003 - Present Denver, Colorado	Manages a small business that conducts financial analysis and evaluation studies in P-20 education. The gross receipts of the company in 2013 were $2.8 million and the company employed 12 staff persons. The focus of the work of the company is on the following topics – education finance, teacher policy and finance, birth to five policy and finance, and evaluation studies. APA is a partner with Marzano Research Laboratory in the Regional Education Laboratory Central. Among other projects, Bob has worked with the New Jersey Department of Education to estimate the cost of high quality preschools, with Jobs for the Future to estimate the return on investment of early college high schools, with the National Center for Education and the Economy to cost out its recommendations about changing the flow of students through the education system, and with several states (including Connecticut, Delaware, and Pennsylvania) to estimate the costs school districts face in meeting state student performance expectations.
Education Commission of the States Vice President (2001-2003); Division Director of K-16 Policy (1999-2001); Division Director of Constituent Services (1998-1999); Director of Field Management (1996 - 1997); Director of Policy Studies (1990-1996);	The Education Commission of the States (ECS) focuses on state education policy and works closely with Governors, state legislators, state education department staff and post-secondary education agency staff. During his time at ECS, Palaich worked on the governors' agenda for Governors Kean, Clinton, McKiernan, Gerringer and Barnes. Nancy Grasmick, Senator Barbara Hoffman and Delegate Pete Rawlings from Maryland were active commissioners of ECS during the period. Transitioned to the role of senior policy analyst with the education Commission of the States (ECS) in 1982. Left the organization in 2003 after serving as vice-president of policy studies and programs and director of P-16 education for four years. Palaich worked with state and local policymakers to evaluate policy in the areas of accountability, at-risk youth, early childhood education, school leadership, teacher policy, P-20 finance and school restructuring. He has written articles while at ECS on education reform, at-risk youth, teacher policy, finance, district spending patterns, tax and

Senior Policy Analyst (1982-1990) 1978 - 2003 Denver, Colorado	expenditure limitations, and the costs and benefits of dual enrollment policy.
Education Finance Center Political Scientist 1978-1982 Denver, Colorado	After joining the Education Finance Center at Education Commission of the States (ECS) in 1978, Palaich helped to direct the project to support the Rubin Commission in New York State come up with a proposed state response to the Levittown vs. Nyquist court case. That project included studies of equity, an analysis of the needs of sub-groups of students, district size, municipal overburden and wealth measurement.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2011 – Present	President	Augenblick, Palaich, and Associates, Inc.	
2003 – 2011	Vice President	Augenblick, Palaich, and Associates, Inc.	Promotion
1978 – 2003	Vice President Division Director, K-16 Policy Division Director, Constituent Services Director, Field Management Director, Policy Studies Senior Policy Analyst	Education Commission of the States	New Opportunity at APA

D. References

List persons the State may contact as employment references

See submission to RFP section 4.4.3.9

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Lawrence O. Picus	Proposed Job Title
Contractor:	Lawrence O. Picus and Associates; DBA Picus Odden and Associates	Principal Investigator

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
The RAND Graduate School / Santa Monica / CA	Ph.D.	1988	Public Policy Analysis
University of Chicago / Chicago / IL	M.A.	1987	Social Science
The RAND Graduate School / Santa Monica / CA	M.Phil.	1986	Public Policy Analysis
Reed College / Portland / OR	B.A.	1977	Economics

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

USC Rossier School of Education
Professor
August 1988 to present
Los Angeles, CA

Serve as a full professor in the school of education. Work includes teaching courses in education finance, economics of education, education policy, school business administration and related fields. Have chaired over 150 Ed.D. dissertations and conduct research on school finance, which is widely published in textbooks and peer reviewed journals.

Picus Odden and Associates (Formerly Lawrence O. Picus and Associates)
Principal Partner and Owner
September 1996 to present
North Hollywood, CA

I am a principal partner and owner of Picus Odden and Associates, a school finance consulting firm. We have conducted school finance adequacy and equity studies in many states including Arkansas, Arizona, North Dakota, Vermont, Maine, Washington, Massachusetts, Kansas, Wyoming, Kentucky, Ohio, New Jersey Wisconsin and others. Several of those states use our adequacy estimates to fund their schools, and Wyoming and Arkansas use our funding model as the basis for their school finance systems. I have testified as an expert witness in several states as well.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
August 1, 1988-Present	Professor	USC Rossier School of Ed	Currently Employed
September 1, 1996-Present	Principal Partner and Owner	Picus Odden & Associates	Currently Employed

D. References

List persons the State may contact as employment references

Reference Name	Job Title or Position	Organization Name	Telephone / Email

RFP# R00R4402342 STUDY OF ADEQUACY OF FUNDING FOR EDUCATION IN THE STATE OF MARYLAND

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Robert Reichardt	Proposed Job Title: Lead Researcher
Contractor:	Augenblick, Palaich, and Associates, Inc.	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
RAND / Santa Monica / CA	Ph.D.	2000	Public Policy Analysis
University of Maryland / College Park / MY	MPP	1995	Public Sector Financial Management
University of Colorado / Boulder / CO	BA	1987	History

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Augenblick, Palaich, and Associates, Inc. Senior Associate 2013 – Present Denver, Colorado Robert Palaich	Conduct policy research and evaluation in areas of education policy, finance, finance adequacy and equity, reform, and teacher compensation and effectiveness. Serve as principal investigator on small- to large-scale research and evaluation projects. Prepare and present reports, both technical and academic for clients, policymakers and academic journals. Advise and provide technical assistance to state and local education policymakers.
R-Squared Research, LLC President 2005 – Present Denver, Colorado	Providing evaluation, research, and analysis to improve education
Center for Education Policy Analysis, Buechner Institute for Governance Director 2006 – 2011 Denver, Colorado Paul Teske	Supervises a team of six researchers and leads teams in the development, implementation and completion of research and evaluation projects.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2013 – Present	Senior Associate	Augenblick, Palaich, and Associates, Inc.	

2005 – Present	President	R-Squared Research	New opportunity at APA
APA Technical Proposal to	R00R4402342 4	9	

2006 –2011	Director	Center for Education Policy Analysis, Buechner Institute for Governance	Started Own Company

D. References

List persons the State may contact as employment references

See submission to RFP section 4.4.3.9

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Jennifer K. Rice	Proposed Job Title
Contractor:	Maryland Equity Project	Lead Researcher

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
Cornell University/ Ithaca/ NY	Ph.D.	1995	Educational
Cornell University/ Ithaca/ NY	MS	1993	Administration and Social Foundations
Marquette University/ Milwaukee/ WI	BS	1990	Mathematics and English

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

University of Maryland Associate Dean for Graduate Studies and Faculty Affairs 2013 – Present College Park, Maryland	Conducts research on the discipline of economics to explore education policy questions concerning the efficiency, equity and adequacy of U.S. education systems. Publishes research articles and book chapters. Oversees the administration of the College of Education.
University of Maryland Professor, 2009-Present Associate Prof, 2002-2007 Assistant Prof, 1995-2002 College Park, Maryland	Responsibilities include teaching graduate level courses and advising graduate students; conducting, publishing, and securing external support for research; and providing service to the university, state, and nation. These teaching, research and service activities have been in the areas of economics of education, education policy, and school finance.
The Urban Institute Visiting Fellow, 2010 Washington, DC	Responsibilities included contributing to work of the National Center for Analysis of Longitudinal Data in Education Research (CALDER). Produced research and policy briefs on issues related to teachers and principals that were widely disseminated. Provided advice on prospective projects and grants. Mentored junior researchers.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2013 – Present	Associate Dean for Graduate Studies	University of Maryland	
2009 – Present	Professor	University of Maryland	

2010	Visiting Fellow	The Urban Institute	End of Contract

D. References

List persons the State may contact as employment references

N/A

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name: Justin R. Silverstein	Proposed Job Title: Principal Investigator
Contractor: Augenblick, Palaich, and Associates, Inc.	

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Colorado / Boulder / CO	BS	1998	Accounting

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

Augenblick, Palaich, and Associates, Inc.
Vice President (2009 – Present);
Senior Associate (2003 – 2008);
Associate (1998 – 2002)
1998 – Present
Denver, Colorado
Robert Palaich

Silverstein has worked on education finance issues at APA since 1997, and has worked on more adequacy studies across the nation than any other individual. He has led APA's work on major school finance projects in Pennsylvania, New Jersey, Alabama, and Washington, D.C, among other states. He also works closely with a number of school districts helping them think through finance and resource issues facing local education agencies. He is experienced in helping state policymakers and other stakeholders find solutions for complex finance issues.

Areas of expertise include school funding adequacy; costing out resources needed to implement specific education policies and practices; advising state policymakers on funding formulas, student enrollment, and other education issues; district and school consolidation; advising school districts on efficiency of resource use; teacher quality and compensation; cost modeling design and implementation; and project leadership/management.

C. Employment History

List employment history, starting with the most recent employment first

Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2009 – Present	Vice President	Augenblick, Palaich, and Associates, Inc.	
2003 – 2008	Senior Associate	Augenblick, Palaich, and Associates, Inc.	Promotion
1998 – 2002	Associate	Augenblick, Palaich, and Associates, Inc.	Promotion

D. References

List persons the State may contact as employment references

See submission to RFP section 4.4.3.9

ATTACHMENT P– RESUMES OF PERSONNEL FORMAT

Instructions: Insert resume information in the fields below; **do not submit other resume formats**. Submit only one resume per Position described in the RFP.

Candidate Name:	Gail Sunderman	Proposed Job Title
Contractor:	Maryland Equity Project	Lead Researcher

A. Education / Training

Institution Name / City / State	Degree / Certification	Year Completed	Field Of Study
University of Chicago / Chicago / IL	Ph.D.	1995	Political Science
University of Chicago / Chicago / IL	MA	1990	International Relations
University of Nebraska/ Omaha/ NE	MA	1976	Psychology
Drake University / Des Moines/ IA	BFA	1972	Art

B. Relevant Work Experience

Describe work experience relevant to the Duties / Responsibilities and Minimum Experience / Knowledge / Skill described in the RFP. Start with the most recent experience first; do not include non-relevant experience.

The Maryland Equity Project, University of Maryland, College of Education Senior Research Scientist June 2013 – Present	Director of the Maryland Equity Project, a research and policy center focused on education in Maryland. Conducts and supervises research on issues relevant to Maryland education policy; conducts research; writes research reports, policy briefs and data briefs; directs the design and implementation of the center, including the solicitation of grants and other sources of funding; supervises graduate assistants and post-doctoral students associated with the center project.
George Washington University Senior Research Scientist Oct. 2008 – Feb. 2012 Washington, DC	Managed and directed a $1.9 million grant from the U.S. Department of Education to operate the Mid-Atlantic Equity Assistance Center, serving the equity needs of school districts in Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia. Worked with school leaders at the state, district and school levels to assess needs, provide technical assistance, and conduct research.
The Civil Rights Project at Harvard University & UCLA 2002-2013 Cambridge, MA	Directed national study on the implementation of NCLB and its effects on low-income and minority students. Conducted research on the changing demographics of school-aged children and the impact of increasing diversity on suburban schools. Developed research design and grant proposals, conducted data collection and analysis, wrote reports and research papers/books for publication, developed and implemented strategies for the dissemination of research findings.

C. Employment History

List employment history, starting with the most recent employment first

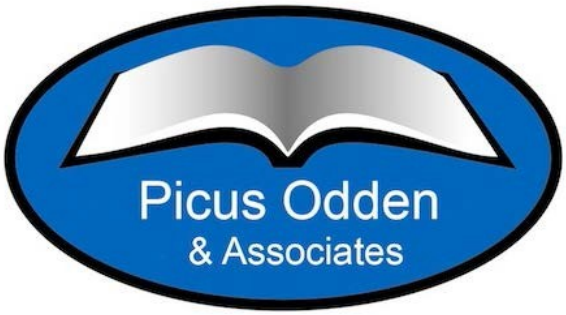
Start and End Dates	Job Title or Position	Organization Name	Reason for Leaving
2013 – Present	Senior Research Scientist	The Maryland Equity Project	

2002 – 2013	Senior Research Associate	The Civil Rights Project	New Position
2008 –2012	Senior Research Scientist	Mid-Atlantic Equity Center	New Opportunity

D. References

List persons the State may contact as employment references

N/A



April 15, 2014

Bob Palaich
APA Consulting
1120 Lincoln St., Suite 1101
Denver, CO 80203

Dear Bob:

This letter confirms the commitment of Lawrence O. Picus and Associates, LLC (doing business as Picus Odden and Associates) to team with APA Consulting to conduct the *Study of Adequacy of Funding for Education in the State of Maryland* as called for in RFP No. R00R44023242. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described as our responsibility in the proposal submitted to Maryland, within the budget included for our subcontract.

Picus Odden and Associates has a long history of conducing school finance adequacy studies across the United States and we believe that combined with the experience and skills of APA and our other partners, we will be able to offer Maryland an unmatched capacity to identify the costs of an adequate education for all school children in that state.

While the partnership is a new venture, on behalf of Allan Odden, the rest of our team and myself, we welcome the chance to work together on this project.

Sincerely,

Lawrence O. Picus

Lawrence O. Picus
Principal Partner and Owner
Picus Odden and Associates

UNIVERSITY OF MARYLAND
OFFICE OF RESEARCH ADMINISTRATION

3112 Lee Building
College Park, Maryland 20742-5141
301.405.6269 TEL 301.314.9569 FAX
oraa@umd.edu
www.ora.umd.edu/

April 10, 2014

Robert Palaich
President; Augenblick, Palaich and Associates
1120 Lincoln Street, Suite 1101
Denver, CO 80203

Proposal Title: Study of Adequacy of Funding for Education in the State of Maryland
UM Principal Investigator: Gail Sunderman
UM Proposal Number: 22562
DUNS Number: 79-093-4285

Dear Dr. Palaich:

Please find enclosed the above referenced proposal submitted on behalf of the University of Maryland and signed by an Authorized Representative. We have assigned a University Proposal Number which you may use to reference this proposal in any future communication with our office. The budget is in the amount of $107,001.00.

We acknowledge that Dr. Sunderman is identified by name as the PI at the University of Maryland and that she intends to carry out all responsibilities identified in the attached proposal. Should this submission result in an award the University of Maryland is prepared to enter into an agreement with Augenblick, Palaich and Associates under mutually acceptable terms and conditions.

Please direct any technical questions regarding this proposal to Dr. Sunderman at gsunderm@umd.edu or 301-405-3572. Administrative or contractual questions should be directed to Rebecca O'Brien, Contract Administrator, at obrienr@umd.edu or 301-405-6271. We look forward to collaborating with you on this project.

Sincerely,

Jakeia M. Bradley

Enclosures

14 April 2014

Mr. Robert Palaich
APA Consulting
1120 Lincoln St., Suite 1101
Denver, CO 80203

Dear Mr. Palaich:

This letter confirms the commitment of Humann Consulting, LLC to team with APA Consulting to conduct the *Study of Adequacy of Funding for Education in the State of Maryland* as called for in RFP No. R00R44023242. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described in the School Size Study in the proposal and budget submitted to Maryland.

I am looking forward to this opportunity to work with APA on this challenging endeavor for the Maryland Department of Education.

Cordially,

Cheryl K. Humann,
Owner
Humann Consulting, LLC

2317 S. Eldridge Ct.
Lakewood, CO 80228 720.841.6335

e
f
d

April 10, 2014

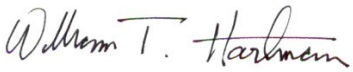
Robert Palaich
APA Consulting
1120 Lincoln St., Suite 1101
Denver, CO 80203

Dear Mr. Palaich:

This letter confirms the commitment of Education Finance Decisions, LLC to team with APA Consulting to conduct the *Study of Adequacy of Funding for Education in the State of Maryland* as called for in RFP No. R00R44023242. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described as our responsibility in the proposal and budget submitted to Maryland.

We are welcome the opportunity to assist APA carry out Maryland's Adequacy of Funding study.

Sincerely,



William T. Hartman
President
Education Finance Decisions, LLC

LEADINGEDGE
SOLUTIONS

April9, 2014

Robert Palaich
APA Consulting
1120 Lincoln St., Suite 1101
Denver, CO 80203

Dear Mr. Palaich:

This letter confirms the commjtment of Leadjng Edge, LLC to team with APA Consulting to conduct the Study of Adequacy of Funding for Education in the State of Maryland as called for in RFP No. ROOR44023242. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described as our responsibility in the proposal and budget submjtted to Maryland.

Leading Edge is a certified veteran-owned Maryland business. We are welcome the opportucity to help APA fulfill Maryland's veteran-owned small business enterprise goals.

Sincerely,

Bernard Jackson
President and CEO
Learung Edge Solutions, LLC

. P 1330A Washinaton Terrace, Suit J01 1 Fort Washington, MD 20744
APA Tech n1ca1 roposa 11o RFP"ffROOR 4402:f42 Office:703:6559432

LETTER OF COMMITMENT

April 14, 2014

Amanda Brown
Senior Associate, APA Consulting
1120 Lincoln Street, Suite 1101
Denver, CO 80203

Ms. Brown:

This letter confirms the commitment of Time Printers, Inc. to team with APA Consulting to conduct a study for the State of Maryland Department of Education. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described as our responsibility in the proposal and budget submitted to Maryland.

Time Printers, Inc. is a certified MBE Maryland business. MBE goals.

Sincerely,

Sincerely,
Al Maddox
Time Printers, Inc. • 227 N. Warwick Avenue • Baltimore, MD 21223 • 410-566-3005
fax: 410-566-9105 • email: aljr@timeprinters.com

COLLABC·)RATIVE
(•
COMMUNICATIONS GROUP
wwwcollaborativ.communic.uons com

1029 Vermont AVfl,t>IW
Ninth Floor
Washongton, DC 20005

202.986.4959 MAIN
202.986.4958 FAX

April14,2014

Robert Palaich
APA Consulting
1120 Lincoln St., Suite 1101
Denver, CO 80203

Dear Mr. Palaich:

This letter confirms the commitment of Collaborative Communications Group, Inc. to team with APA Consulting to conduct the *Study of Adequacy of Funding for Education in the State of Maryland* as called for in RFP No. ROOR44023242. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described as our responsibility in the proposal and budget submitted to Maryland.

Collaborative is a certified economically disadvantaged woman owned small business (EDWOSB) based in Washington, DC. We welcome the opportunity to help APA fulfill Maryland's economically-disadvantaged and small business enterprise goals.

Sincerely,

Shawn Stelow Griffin
Director
Collaborative Communications

Early Childhood Policy Research

1250 Honey Hollow Road
Climax, New York 12042

Voice: (518) 966-4585
E-mail: anne@earlychildhoodfinance.org
Website: www.earlychildhoodfinance.org

April 14, 2014

Robert Palaich
APA Consulting
1120 Lincoln St., Suite 1101
Denver, CO 80203

Dear Mr. Palaich:

This letter confirms the commitment of Early Childhood Policy Research to team with APA Consulting to conduct the Study of Adequacy of Funding for Education in the State of Maryland as called for in RFP No. R00R44023242. We agree to work cooperatively with the staff of APA and other subcontractors to complete the scope of work described as our responsibility in the proposal and budget submitted to Maryland.

The prekindergarten section of the scope of work, in which we will participate, is especially timely given the current high interest in preschool across the nation. We are very pleased to join the strong team that has been assembled.

Sincerely,

Anne W. Mitchell
President

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.8 Offeror Qualifications and Capabilities

4.4.3.8 Offeror Qualifications and Capabilities

Founded in 1983, Augenblick, Palaich and Associates, Inc. (APA) is a privately owned S corporation with extensive experience in analyzing public education systems and policies. Founder John Augenblick developed the company from a small, two-person operation in 1983 to a 12-employee company that now operates with an annual budget of close to $3 million. Since its founding, this small business has served clients in all 50 states.

Over the years, APA has been awarded research, analysis, evaluation, technical assistance and other contracts from a wide variety of state and local government agencies and school districts, foundations and not-for-profit entities. Examples of just a few of the clients APA has served include the Pennsylvania State Board of Education, the Maryland Department of Education, the New Jersey Department of Education, the Colorado Department of Education, the Kansas Department of Education, the Kansas State Legislature, the Nebraska Department of Education, the Illinois State Board of Education, the Indiana State Legislature, the New York Attorney General's Office, the Institute for Wisconsin's future, Jobs For the Future, the BellSouth Foundation, the Charles Stewart Mott Foundation, the David and Lucille Packard Foundation, the Ford Foundation, the Arizona Business and Education Coalition, the North Carolina Attorney General's Office, the Associated School Boards of South Dakota, the Austin Independent School District in Texas, the Denver Public School District in Colorado, Helena Public Schools in Montana, Aurora Public Schools in Colorado, the Center on Education Policy, the Mid-Continent Regional Education Laboratory, Missouri Education Coalition for Adequacy, the National Board for Professional Teaching Standards, the National Center for Education Statistics, the National Center on Education and the Economy and the National School Boards Association.

In 2014, APA will work on projects for 30 clients with sites in at least 14 states.

Geographic Locations of Current APA Clients

State	City	State	City
Alabama	Montgomery	**Kentucky**	Lexington
Arizona	Phoenix	**Maryland**	Rockville
California	San Francisco	**New York**	Albany
Colorado	Boulder	**New York**	Climax
Colorado	Denver	**Ohio**	Cincinnati

Colorado	Centennial	**Oregon**	Portland
Colorado	Golden	**Pennsylvania**	Philadelphia
District of Columbia	Washington	**Virginia**	Arlington
Florida	Boynton Beach	**Virginia**	Fairfax
Illinois	Lombard		

APA's extensive experience in school finance and costing out studies provides APA with a clear and deep understanding of how fiscal systems interact with various initiatives and priorities within states. Examples of APA expertise in this area are described in sections below.

Adequacy/Costing Out Studies

The demand to know the cost of an adequate education has continued to grow, and APA has continued to be the consulting firm chosen most frequently to conduct studies on this topic. This work helps state leaders better understand the level of resources that is adequate to the primary task set before schools and districts: ensuring all students can meet state and federal academic performance expectations. Adequacy study results therefore play a key role in helping policymakers understand what it will cost for schools to meet the student performance objectives in legislation, such as the federal No Child Left Behind Act. To date, APA has conducted costing out studies in 25 states. The following table presents the studies that APA has been involved in:

State	Year	Title
Alabama	Current	*Not yet released*
Arkansas	1998	A Report on Selected Areas of the Arkansas School Funding
Colorado	2011	Costing Out the Resources Needed to Meet Colorado Education Standards and Requirements
	2006	Estimating Colorado School District Costs to Meet State and Federal Education Accountability Requirements
	2003	Calculation of the cost of an Adequate Education in Colorado using the Professional Judgment and the Successful School District Approaches
Connecticut	2005	Estimating the Cost of an Adequate Education in Connecticut
Delaware	2006	Estimating the Cost of an Adequate Education in Delaware

Illinois	2001	A Procedure for Calculating a Base Cost Figure and an Adjustment for At-Risk Pupils That Could be Used in the Illinois School Finance System
Indiana	2002	Calculation of the Cost of an Adequate Education in Indiana in 2001-2002 Using the Professional Judgment Approach
Kansas	2002	Calculation of the Cost of a Suitable Education in Kansas in 2000-2001 using Two Different Analytical Approaches
Maine	1993	Determining A Base Cost level for Maine's School Finance System: Issues and Alternatives
Maryland	2001	Calculation of the Cost of an Adequate Education in Maryland in 1999-2000 Using Two Different Analytic Approaches.
Minnesota	2006	Estimating the Cost of an Adequate Education in Minnesota
Mississippi	1993	School Finance in Mississippi : A Proposal for an Alternate System
Missouri	2003	An Estimation of the Total Cost of Implementing the Result of the School Finance Adequacy Study Undertaken by the Missouri Coalition for Education Adequacy
Montana	2007 2002	Estimating the Cost of an Adequate Education in Montana Calculation of the Cost of a Suitable Education in Montana in 2001-2002 Using the Professional Judgment Approach
Nebraska	2003	Calculation of the Cost of an Adequate Education in Nebraska in 2002-2003 Using the Professional Judgment Approach
Nevada	2006	Estimating the Cost of An Adequate Education in Nevada
New Hampshire	1998	Alternative Approaches for Determining a Base Figure and Pupil-Weighted Adjustments for Use in a School Finance System in New Hampshire
New Jersey	2003	Report on the Cost of Education
North Dakota	2003	Calculation of the Cost of an Adequate Education in North Dakota in 2002-2003 Using the Professional Judgment Approach
Ohio	1997 1993	Recommendations for a Base Figure and Pupil-Weighted Adjustments to the Base Figure for Use in a New School Finance System in Ohio Determining a Base Student Cost Figure for Use in Ohio's School Foundation Program
Oklahoma	2005	Calculating the Cost of an Adequate Education in Oklahoma
Pennsylvania	2007	Costing Out the Resources Needed to Meet Pennsylvania's Public Education Goals
South Carolina	2000	Determining an Adequate Per Pupil Funding Level for Public K-12 Education in South Carolina in Relationship to Pupil Performance Objectives: Creating the Basis for an Agreement Between the State and Local School Districts with Appropriate Accountability at Both Levels

South Dakota	2006	Estimating the Cost of an Adequate Education in South Dakota
Tennessee	2004	Calculation of the Cost of An Adequate Education in Tennessee in 2001-02 Using the Professional Judgment Approach and the Successful School District Approach
Texas	2003	An Estimation of the Total Cost in 2002-03 of Implementing the Results of the School Finance Adequacy Study Undertaken By Augenblick, Palaich and Associates, Inc.

In addition to the studies listed above, our proposed partner for this Maryland study, Picus Odden & Associates, since 2000, has conducted school finance studies in Arizona, Arkansas, Kentucky, Maine, New Jersey, North Dakota, Ohio, Oregon, Vermont, Washington, Wisconsin, Wyoming and Texas. Overall, the combined efforts of APA and POA make up the vast majority of the adequacy studies completed in the states.

School Funding Equity and Funding Formula Development

APA also has significant experience analyzing and designing state systems that allocate funds to schools. Ensuring that such systems are equitable and efficient is a key priority for clients. APA has helped design the school funding formulas used in several states, including Colorado, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, New Hampshire, Ohio and South Dakota. APA has also worked at the county and district level to determine whether inequities exist in the resources available to districts and schools. APA was for instance, hired by business leaders in Lehigh County, Pennsylvania to determine whether resource disparities existed for the state's third largest urban school district. Based on data gathering, analysis and interviews with county leaders and district superintendents, APA was able to document significant resource disparities that led the state legislature to provide nearly $11 million in new funding for the Allentown City School District.

Efficiency of Resource Use

APA is often hired by counties, state legislatures and state departments of education to review the efficiency of school systems and to offer recommendations for changes that may be required to implement reforms. APA has developed a series of efficiency screens to appropriately identify districts that not only achieve at a high level, but do so in an efficient fiscal manner. Using these screens, APA can: (1) offer recommendations for updates to state education funding formulas; (2) offer recommendations for how states can incorporate district efficiency incentives into the state's education funding system; (3) analyze school district spending to identify overall efficiency; and (4) analyze school district staffing to identify areas where districts may require more or less support to be successful.

A History of Direct Service to State Education Agencies

APA has a long history of providing direct service to state education agencies (SEAs), and is experienced in working with SEA leaders and staff to develop an appropriate scope of work to best meet SEA needs. A sample of direct assistance provided to SEAs includes:

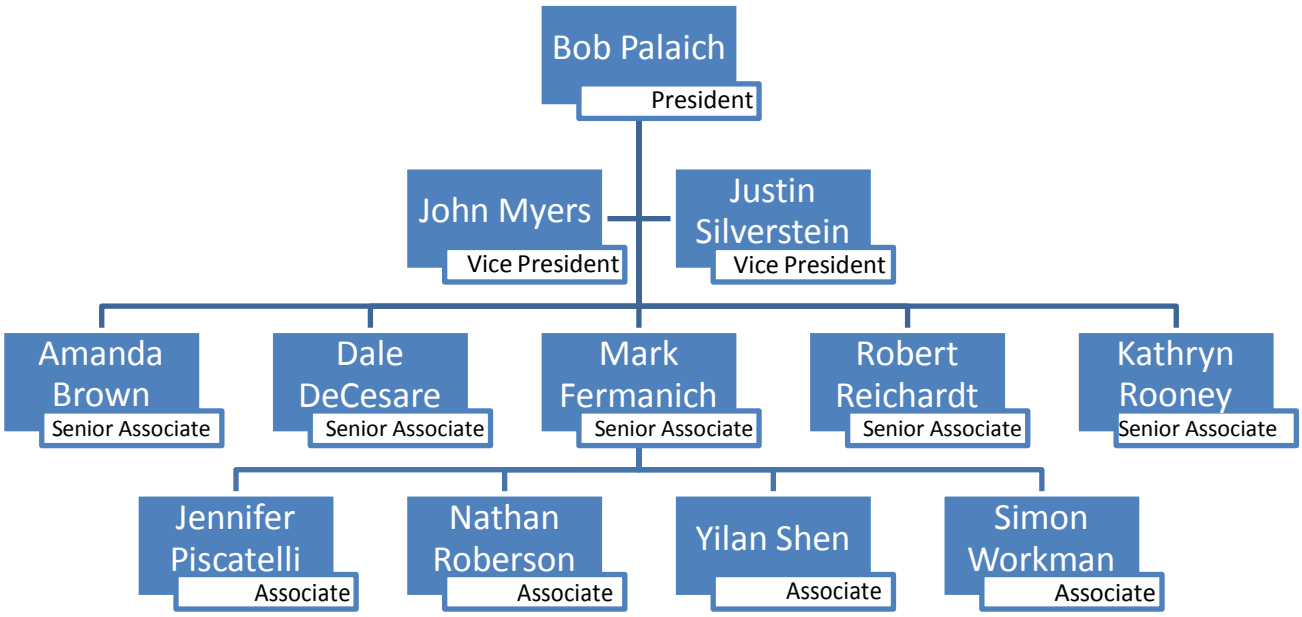
- APA has examined aspects of the school finance systems in more than 10 states at some point during the last 15 years. In some cases, this work was performed directly for the SEA, although in other cases the work was undertaken for the legislature or a special study group with the involvement of the SEA. While APA made recommendations to restructure the way the state allocates aid to school districts in each state, those recommendations were implemented in some of these states where litigation was not the stimulus for the examination.
- In Colorado, APA completed analyses of the costs associated with new policies enacted by the legislature. These new policies included broad legislation designed to change the way state assessments were administered and utilized, as well as legislation designed to change the way teachers and administrators were being evaluated. In one case, this work was done directly for the SEA while in the other case the work was done for the foundation that supports the SEA.
- APA is working with the Nebraska SEA to design a system to evaluate teachers, based in part on student assessment data, and to use such assessments to provide professional development to teachers. This work is being done under the auspices of the Central Regional Education Laboratory sponsored by the U.S. Department of Education.
- APA provided technical assistance to the Louisiana SEA to determine a set of common characteristics that distinguished highly successful school districts from less successful districts, in terms of student academic performance. This work was done after the firm had worked with the SEA for almost 20 years in redesigning the state's school finance system. Louisiana modified their school finance system in 1994 after APA studied the system and made recommendations.
- APA recently worked with the Mississippi SEA to improve the delivery of professional development and other services to the state's lowest performing school districts, located in the Delta region of the state. APA met with a team of people involved with the sponsoring foundation, reviewed the team's planning, met with community and education leaders in several school districts in the region, and suggested changes in the way services are organized and delivered. Many of these recommendations have now been implemented.

APA is a client-driven company whose philosophy is to bring an array of skills to bear in order to help federal, state, and local education policymakers make the best, most informed decisions possible with regard to public education policies and programs. APA currently employs 12 staff, all working out of the Denver office. All of our staff members have doctorate-level degrees, advanced degrees or unique and extensive field experience in public education policy. Some have been teachers, served on charter school boards or served as staff to state legislatures and executive offices, while others have diverse backgrounds in public policy development, research and analysis.

APA staff members typically work in teams, with differing team members each bringing a unique set of qualitative, quantitative and communications expertise. Using this team-based approach, our staff members are exposed to a wide range of education issues that gives them a strong breadth of knowledge across multiple topics that impact public education. Experienced, senior staff members monitor the development and creation of all products and services.

Project managers at APA work studiously to bill accurately and in a timely manner. If it becomes clear that a mistake has been made, APA will work with the officer assigned by the Maryland State Department of Education to rectify the error and APA will assume all fiscal responsibility for the problem.

APA President, Bob Palaich, along with Vice President, Justin Silverstein and Senior Associate, Mark Fermanich will have responsibility for supervising and coordinating the services performed for this contract. The following organizational chart presents the organizational structure of APA.



Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for Education in the State of Maryland

4.4.3.9 References

4.4.3.9 APA References

Reference 1

a. Alabama Department of Education
b. Chief of Staff, Dr. Craig Pouncey, 334-242-9755, cpouncey@alsde.edu
c. Value: $338,950
   Type: Equity Analysis and Adequacy Study
   Duration: 18 months
   Description: Full review of the state's school finance structure including an equity analysis, adequacy study using professional judgment and successful schools and recommendations on how to change formula.

Reference 2

a. District of Columbia Deputy Mayor for Education, Office of the Deputy Mayor for Education
b. Deputy Mayor, Abigail Smith, (202) 727-3636, abigail.smith@dc.gov
c. Value: $463,751, APA share $130,000
   Type: Adequacy Study
   Duration: 15 months
   Description: APA served as the lead for implementing two adequacy approaches, the professional judgment and successful schools approaches, to determine the resources needed for D.C. students to meet education standards. APA worked with The Finance Project to involve stakeholders across D.C. in completing the work. After completing the adequacy studies, a set of recommendations were created for D.C. on how to implement the findings. APA worked with the Deputy Mayor's office to estimate the costs of implementing the recommendations and helped prepare the final report. The findings of the study have been used to propose changes to the coming budget year's funding for D.C. study. APA has been retained to provide additional support for creating models D.C. can use to update the work into the future.

Reference 3

a. New York State Council on Children and Families
b. Deputy Director, Robert Frawley and Project Manager, Stephanie Woodard, bob.frawley@ccf.ny.gov, stephanie.woodard@ccf.ny.gov, 518-486-4690
c. Value: $227,525
   Type: Early childhood cost model
   Duration: 3 years and 4 months
   Description: Web-based early childhood cost estimation model, including return-on-investment module and data on all NYS early childhood programs.

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.10 List of Current or Prior State Contracts

APA is not currently performing nor has APA within the past five years performed services under contract with any entity of the State of Maryland. This is also true for POA.

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.11 Financial Capability

- 2012 Income Statement
- 2013 Income Statement
- 2012 Balance Sheet
- 2013 Balance Sheet

Augenblick, Palaich and Associates, Inc
Income Statement
For the Twelve Months Ending December 31, 2012

	Current Month		Year to Date	
Revenues				
Consulting Income	$ 2,248,230.01	99.92	$ 2,248,230.01	99.92
Sales of Materials	0.00	0.00	0.00	0.00
Interest Income	123.44	0.01	123.44	0.01
Finance Charge Income	0.00	0.00	0.00	0.00
Other Income	1,589.17	0.07	1,589.17	0.07
Sales/Fees Discounts	0.00	0.00	0.00	0.00
Total Revenues	2,249,942.62	100.00	2,249,942.62	100.00
Cost of Sales				
Cost of Sales	0.00	0.00	0.00	0.00
Cost of Sales-Salary & Wage	0.00	0.00	0.00	0.00
Inventory Adjustments	0.00	0.00	0.00	0.00
Total Cost of Sales	0.00	0.00	0.00	0.00
Gross Profit	2,249,942.62	100.00	2,249,942.62	100.00
Expenses				
John Augenblick Employee Ret.	0.00	0.00	0.00	0.00
John Augenblick Employee Retir	0.00	0.00	0.00	0.00
Bob Palaich Employee Ret.	0.00	0.00	0.00	0.00
Bob Paliach Employee Retir	0.00	0.00	0.00	0.00
Justin Silverste Employee Ret.	0.00	0.00	0.00	0.00
Justin Silverst Employee Retir	0.00	0.00	0.00	0.00
John Myers Employee Ret.	0.00	0.00	0.00	0.00
John Myers Employee Retir	0.00	0.00	0.00	0.00
Dale DeCesare Employee Ret.	0.00	0.00	0.00	0.00
Dale DeCesare Employee Retir	0.00	0.00	0.00	0.00
Doug RoseEmployee Ret.	0.00	0.00	0.00	0.00
Doug Rose Employee Retir	0.00	0.00	0.00	0.00
Amy Anderson Employee Ret.	0.00	0.00	0.00	0.00
Amy Anderson Employee Retir	0.00	0.00	0.00	0.00
Amanda Brown Employee Ret.	0.00	0.00	0.00	0.00
Amanda Brown Employee Retir	0.00	0.00	0.00	0.00
Wages Expense	1,242,744.56	55.23	1,242,744.56	55.23
Contract Labor	451,720.44	20.08	451,720.44	20.08
Dependent Set Aside	0.00	0.00	0.00	0.00
Employee Benefit Programs Exp	80,287.63	3.57	80,287.63	3.57
Payroll Tax Expense	84,944.87	3.78	84,944.87	3.78
Medical Set Asides	0.00	0.00	0.00	0.00
Payroll Expenses	21,752.25	0.97	21,752.25	0.97
Worker's Comp	2,805.91	0.12	2,805.91	0.12
Bad Debt Expense	0.00	0.00	0.00	0.00
Additional Retirment Plan cont	0.00	0.00	0.00	0.00
Income Tax Expense	0.00	0.00	0.00	0.00
Tax Prep Expense	0.00	0.00	0.00	0.00
Other Taxes Expense	646.82	0.03	646.82	0.03
Rent or Lease Expense	76,495.43	3.40	76,495.43	3.40
Maintenance & Repairs Expense	0.00	0.00	0.00	0.00
Utilities Expense	0.00	0.00	0.00	0.00
Office Supplies Expense	7,681.98	0.34	7,681.98	0.34
Software	0.00	0.00	0.00	0.00
Telephone Expense	13,942.93	0.62	13,942.93	0.62
IT Support	13,792.89	0.61	13,792.89	0.61
Other Office Expense	11,813.43	0.53	11,813.43	0.53
Airline Expense	0.00	0.00	0.00	0.00
Legal Fees	7,579.20	0.34	7,579.20	0.34

Lodging Expense	0.00	0.00	0.00	0.00

Augenblick, Palaich and Associates, Inc
Income Statement
For the Twelve Months Ending December 31, 2012

	Current Month		Year to Date	
Food Expense	0.00	0.00	0.00	0.00
Meeting Expenses	31,279.07	1.39	31,279.07	1.39
Other Travel Expenses	133,684.72	5.94	133,684.72	5.94
Expense Reimbursement	6,198.20	0.28	6,198.20	0.28
Ex[emse Reimbursement - Meals	1,641.09	0.07	1,641.09	0.07
Phone Reimbursement	5,517.50	0.25	5,517.50	0.25
Commissions and Fees Expense	0.00	0.00	0.00	0.00
Freight Expense	0.00	0.00	0.00	0.00
Service Charge Expense	0.00	0.00	0.00	0.00
Purchase Disc-Expense Items	0.00	0.00	0.00	0.00
Insurance Expense	2,819.16	0.13	2,819.16	0.13
Disability Insurance	1,311.46	0.06	1,311.46	0.06
Health Insurance	0.00	0.00	0.00	0.00
Fees	44.00	0.00	44.00	0.00
Penalties	0.00	0.00	0.00	0.00
Interest Expense	595.94	0.03	595.94	0.03
Loan interest expense	35.00	0.00	35.00	0.00
Misc. Expense	50.00	0.00	50.00	0.00
Depreciation Expense	19,002.96	0.84	19,002.96	0.84
Gain/Loss - Sale of Assets Exp	0.00	0.00	0.00	0.00
Meals and Entertainment	0.00	0.00	0.00	0.00
Banking Fees	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
Insurance Expense	0.00	0.00	0.00	0.00
Total Expenses	2,218,387.44	98.60	2,218,387.44	98.60
Net Income	$ 31,555.18	1.40	$ 31,555.18	1.40

Augenblick, Palaich and Associates, Inc
Income Statement
For the Twelve Months Ending December 31, 2013

	Current Month		Year to Date	
Revenues				
Consulting Income	$ 2,662,616.94	99.70	$ 2,662,616.94	99.70
Sales of Materials	0.00	0.00	0.00	0.00
Interest Income	445.00	0.02	445.00	0.02
Finance Charge Income	0.00	0.00	0.00	0.00
Other Income	7,454.06	0.28	7,454.06	0.28
Sales/Fees Discounts	0.00	0.00	0.00	0.00
Total Revenues	2,670,516.00	100.00	2,670,516.00	100.00
Cost of Sales				
Cost of Sales	0.00	0.00	0.00	0.00
Cost of Sales-Salary & Wage	0.00	0.00	0.00	0.00
Inventory Adjustments	0.00	0.00	0.00	0.00
Total Cost of Sales	0.00	0.00	0.00	0.00
Gross Profit	2,670,516.00	100.00	2,670,516.00	100.00
Expenses				
John Augenblick Employee Ret.	0.00	0.00	0.00	0.00
John Augenblick Employee Retir	0.00	0.00	0.00	0.00
Bob Palaich Employee Ret.	0.00	0.00	0.00	0.00
Bob Paliach Employee Retir	0.00	0.00	0.00	0.00
Justin Silverste Employee Ret.	0.00	0.00	0.00	0.00
Justin Silverst Employee Retir	0.00	0.00	0.00	0.00
John Myers Employee Ret.	0.00	0.00	0.00	0.00
John Myers Employee Retir	0.00	0.00	0.00	0.00
Dale DeCesare Employee Ret.	0.00	0.00	0.00	0.00
Dale DeCesare Employee Retir	0.00	0.00	0.00	0.00
Doug RoseEmployee Ret.	0.00	0.00	0.00	0.00
Doug Rose Employee Retir	0.00	0.00	0.00	0.00
Amy Anderson Employee Ret.	0.00	0.00	0.00	0.00
Amy Anderson Employee Retir	0.00	0.00	0.00	0.00
Amanda Brown Employee Ret.	0.00	0.00	0.00	0.00
Amanda Brown Employee Retir	0.00	0.00	0.00	0.00
Wages Expense	1,304,349.90	48.84	1,304,349.90	48.84
Contract Labor	526,185.60	19.70	526,185.60	19.70
Dependent Set Aside	0.00	0.00	0.00	0.00
Employee Benefit Programs Exp	79,782.52	2.99	79,782.52	2.99
Payroll Tax Expense	89,565.69	3.35	89,565.69	3.35
Medical Set Asides	221.87	0.01	221.87	0.01
Payroll Expenses	22,058.04	0.83	22,058.04	0.83
Worker's Comp	2,942.00	0.11	2,942.00	0.11
Bad Debt Expense	0.00	0.00	0.00	0.00
Additional Retirment Plan cont	0.00	0.00	0.00	0.00
Income Tax Expense	0.00	0.00	0.00	0.00
Tax Prep Expense	0.00	0.00	0.00	0.00
Other Taxes Expense	499.00	0.02	499.00	0.02
Rent or Lease Expense	92,520.53	3.46	92,520.53	3.46
Maintenance & Repairs Expense	0.00	0.00	0.00	0.00
Utilities Expense	1,550.27	0.06	1,550.27	0.06
Office Supplies Expense	3,423.42	0.13	3,423.42	0.13
Software	0.00	0.00	0.00	0.00
Telephone Expense	12,854.67	0.48	12,854.67	0.48
IT Support	16,374.25	0.61	16,374.25	0.61
Other Office Expense	8,182.87	0.31	8,182.87	0.31
Airline Expense	0.00	0.00	0.00	0.00
Legal Fees	4,137.50	0.15	4,137.50	0.15

Lodging Expense	0.00	0.00	0.00	0.00

Augenblick, Palaich and Associates, Inc
Income Statement
For the Twelve Months Ending December 31, 2013

	Current Month		Year to Date	
Food Expense	0.00	0.00	0.00	0.00
Meeting Expenses	39,172.63	1.47	39,172.63	1.47
Other Travel Expenses	133,411.84	5.00	133,411.84	5.00
Expense Reimbursement	6,439.55	0.24	6,439.55	0.24
Ex[emse Reimbursement - Meals	2,253.06	0.08	2,253.06	0.08
Phone Reimbursement	6,910.00	0.26	6,910.00	0.26
Commissions and Fees Expense	0.00	0.00	0.00	0.00
Freight Expense	0.00	0.00	0.00	0.00
Service Charge Expense	0.00	0.00	0.00	0.00
Purchase Disc-Expense Items	0.00	0.00	0.00	0.00
Insurance Expense	7,558.75	0.28	7,558.75	0.28
Disability Insurance	1,134.84	0.04	1,134.84	0.04
Health Insurance	0.00	0.00	0.00	0.00
Fees	904.00	0.03	904.00	0.03
Penalties	0.00	0.00	0.00	0.00
Interest Expense	0.00	0.00	0.00	0.00
Loan interest expense	0.00	0.00	0.00	0.00
Misc. Expense	1,875.00	0.07	1,875.00	0.07
Depreciation Expense	9,418.99	0.35	9,418.99	0.35
Gain/Loss - Sale of Assets Exp	0.00	0.00	0.00	0.00
Meals and Entertainment	0.00	0.00	0.00	0.00
Banking Fees	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00
Insurance Expense	516.26	0.02	516.26	0.02
Total Expenses	2,374,243.05	88.91	2,374,243.05	88.91
Net Income	$ 296,272.95	11.09	$ 296,272.95	11.09

Augenblick, Palaich and Associates, Inc
Balance Sheet
December 31, 2012

ASSETS

Current Assets			
Chase Money Market	$	16,306.43	
Chase Checking		4,932.28	
Total Current Assets			21,238.71
Property and Equipment			
Computer Equipment		74,149.96	
Funriture and Fixtures		9,475.00	
Accumulated Depr. - Computer		(73,787.96)	
Acccumulated Depr. Furn and Fi		(9,475.00)	
Total Property and Equipment			362.00
Other Assets			
Total Other Assets			0.00
Total Assets			$ 21,600.71

LIABILITIES AND CAPITAL

Current Liabilities			
Total Current Liabilities			0.00
Long-Term Liabilities			
Total Long-Term Liabilities			0.00
Total Liabilities			0.00
Capital			
Retained Earnings	$	(28,944.46)	
Paid-in Capital		11,000.00	
Common Stock		20,240.00	
Dividends Paid		(12,250.01)	
Net Income		31,555.18	
Total Capital			21,600.71
Total Liabilities & Capital			$ 21,600.71

Unaudited - For Management Purposes Only

Augenblick, Palaich and Associates, Inc
Balance Sheet
December 31, 2013

ASSETS

Current Assets			
Chase Money Market	$	202,926.39	
Chase Checking		6,593.67	
Irvine Holding Account		63,374.81	
Total Current Assets			272,894.87
Property and Equipment			
Computer Equipment		83,398.95	
Funriture and Fixtures		9,475.00	
Accumulated Depr. - Computer		(83,206.95)	
Acccumulated Depr. Furn and Fi		(9,475.00)	
Total Property and Equipment			192.00
Other Assets			
Total Other Assets			0.00
Total Assets			$ 273,086.87

LIABILITIES AND CAPITAL

Current Liabilities			
Deferred Revenue	$	63,213.21	
Total Current Liabilities			63,213.21
Long-Term Liabilities			
Total Long-Term Liabilities			0.00
Total Liabilities			63,213.21
Capital			
Retained Earnings		(9,639.29)	
Common Stock		28,240.00	
Dividends Paid		(105,000.00)	
Net Income		296,272.95	
Total Capital			209,873.66
Total Liabilities & Capital			$ 273,086.87

Unaudited - For Management Purposes Only

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.12 Certificate of Insurance

- General Liability Insurance
- Workman's Compensation Insurance
- Miscellaneous Errors and Omissions Liability Insurance

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 2/4/2014

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Keller-Lowry Insurance Inc
1777 S Harrison St #700
Denver CO 80210

CONTACT NAME: Teresa Heupel
PHONE (A/C, No, Ext): (303)756-9909 **FAX (A/C, No):** (303)756-8818
E-MAIL ADDRESS: icanhelp@kellerlowry.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: Philadelphia Insurance Company	23850
INSURER B: Pinnacol Assurance	41190
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
Clayton Early Learning, Trustee,
George W.Clayton Trust
3801 Martin Luther King Blvd
Denver CO 80205

COVERAGES **CERTIFICATE NUMBER:** 13-14GL,AU,WC,UM,E&O **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC			PHPK1041144	7/1/2013	7/1/2014	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ 5,000 $ 1,000,000 $ 3,000,000 $ 3,000,000
A	AUTOMOBILE LIABILITY ANY AUTO X ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS			PHPK1041144	7/1/2013	7/1/2014	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10,000			PHUB426142	7/1/2013	7/1/2014	EACH OCCURRENCE AGGREGATE	$ 4,000,000 $ 4,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N: N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		4058502	7/1/2013	7/1/2014	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 500,000 $ 500,000 $ 500,000
A	PROFESSIONAL LIABILITY			PHPK1041144 DED $0	7/1/2013	7/1/2014	PER AGGREGATE PER CLAIM	$3,000,000 $1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER

rmp@apaconsulting.net

Augenblick, Palaich & Associates, Inc.
1120 Lincoln St.,
Suite 1101
Denver, CO 80203

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

T Sibelius CIC CRM/TM

AUTOMATIC DATA PROCESSING INS AGCY
PO BOX 33015
SAN ANTONIO TX 78265

DENVER PRESCHOOL PROGRAM
DENVER RISK ADMINISTRATOR
201 W COLFAX AVE DEPT 1105
DENVER CO 80202

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 2/4/2014

THIS CERTIFICATEIS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATIONIS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
AUTOMATIC DATA PROCESSING INS AGCY 250717 P: F: PO BOX 33015 SAN ANTONIO TX 78265	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC#
	INSURER A : Trumbull Ins Co	27120
INSURED	INSURER B :	
AUGENBLICK, PALAICH AND ASSOCIATES 1120 LINCOLN ST STE 1101 DENVER CO 80203	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS,EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY CLAIMS-MADE / OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY / PRO-JECT / LOC OTHER:						EACH OCCURRENCE	$
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
							GENERAL AGGREGATE	$
							PRODUCTS - COMP/OP AGG	$
								$
	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED AUTOS / SCHEDULED AUTOS HIRED AUTOS / NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident)	$
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB / OCCUR **EXCESS LIAB** / CLAIMS-MADE DED / RETENTION $						EACH OCCURRENCE	$
							AGGREGATE	$
								$
A	*WORKERS COMPENSATION AND EMPLOYERS' LIABILITY* Y/N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? *(Mandatory in NH)* If yes, describe under DESCRIPTION OF OPERATIONS below	N/ A		76 WEG GC4345	01/01/2014	01/01/2015	X PER STATUTE / OTH-ER	
							E.L. EACH ACCIDENT	$100,000
							E.L. DISEASE- EA EMPLOYEE	$100,000
							E.L. DISEASE - POLICY LIMIT	$500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES **(ACORD 101, Additional Remarks Schedule, may be attached if more space is required)**

Those usual to the Insured's Operations.

CERTIFICATE HOLDER	CANCELLATION
DENVER PRESCHOOL PROGRAM DENVER RISK ADMINISTRATOR 201 W COLFAX AVE DEPT 1105 DENVER, CO 80202	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. ***AUTHORIZED REPRESENTATIVE***

State Farm Fire and Casualty Company
A Stock Company with Home Offices in Bloomington, Illinois
Herein called the Insurer

MISCELLANEOUS ERRORS AND OMISSIONS LIABILITY INSURANCE POLICY

Policy No: PS0000004740300
Renewal of Policy No:

PART 1. DECLARATIONS PAGE

THIS IS A CLAIMS MADE POLICY. DEFENSE COSTS ARE INCLUDED IN THE LIMIT OF LIABILITY. PLEASE READ THE ENTiRE POLiCY CAREFULLY.

THIS DECLARATIONS PAGE, ALONG WITH YOUR SIGNED APPLICATION OR RENEWAL APPLICATION AND ALL FORMS AND ENDORSEMENTS LISTED IN ITEM 8. BELOW COMPLETE THE POLICY.

IN RETURN FOR THE PAYMENT OF THE PREMIUM, WE AGREE WITH YOU TO PROVIDE INSURANCE UNDER THE PROViSiONS OF THiS POLiCY.

Item 1. Named Insured: AUGENBLICK, PALAICH AND ASSOCIATES, INC.

Address: 1120 Lincoln, Suite 1101
Denver, CO 80203

Item 2. Policy Period:
Effective Date: November 1, 2013 Expiration Date: November 1, 2014
(12:01 A.M. Standard Time at the Address stated in Item 1.)

Item 3. Retroactive Date: November01, 2013 IF NO DATE IS STATED HERE, COVERAGE DOES NOT APPLY TO WRONGFUL ACTS COMMiTTED PRiOR TO THE EFFECTiVE DATE STATED iN ITEM 2. ABOVE.

Item 4. Schedule of Insured Services:

Management consulting services including research and analysis, strategic planning and related project management services.

PART 1. DECLARATIONS PAGE (Continued)

Named Insured: AUGENBLICK, PALAICH AND ASSOCIATES, INC.

Policy No: PS0000004740300

Item 5.	Limit of Liability:	a.	$1,000,000	Each **Wrongful Act**
		b.	$1,000,000	Total Limit of Liability
Item 6.	Retention:		$15,000	Each **Wrongful Act**
Item 7.	Premium:		$13,235.00	

Item 8. Form(s) and Endorsement(s) made part of this Policy at the time of issuance:

PSMS4000(01/01)	Miscellaneous Errors and Omissions Liability Insurance Policy
PSMS4037(01/01)	Management Consultant Endorsement
PSMS4047(01/01)	Independent Contractors - **Persons** Insured Endorsement
PSMS4049CO(01/02)	Amendatory Endorsement

Item 9. Notices to the Insurer- All notices to the Insurer pertaining to this Policy must be sent to:

State Farm Specialty Products
111 North Canal Street, Suite 940
Chicago, IL 60606-7201

By: _____
Authorized Representative

Date of Issue: November 8, 2013

Response to Request for Proposals
Solicitation No. R00R4402342:

Study of Adequacy of Funding for
Education in the State of Maryland

4.4.3.13 Subcontractors

4.4.3.13 Subcontractors

Augenblick, Palaich and Associates has assembled one of the strongest project teams ever to conduct such a comprehensive set of school finance analyses. Picus Odden and Associates (POA) and the Maryland Equity Project will partner with APA to undertake key elements of the project. In addition, we are subcontracting with a number of nationally recognized experts to lead or assist with several of the other studies requested in the RFP, several of which are Maryland based. The qualifications and experience of APA, POA and the Maryland Equity Project are described in-depth in the 4.4.3.7 Experience and Qualifications of Proposed Staff section of the proposal. Below, we provide details of the additional subcontractors.

In the process of assembling renowned experts of the field and fulfilling Maryland's MBE and VSBE subcontracting goals, APA was able to meet some specific requirements of the law, and in other ways, meet the spirit of the law. In addition to the woman-owned, minority-owned and veteran-owned subcontractors listed below, we would also note that Jennifer Imazeki, who is an affiliate and subcontractor of POA, is an Asian and female small business owner. Not all these minority enterprises are Maryland certified per say. However, the certification process is lengthy and we wanted to indicate that these experts will be parts of our project team, and show our commitment to Maryland's MBE and VSBE subcontracting goals.

Organization	**Tasks**	**MBE/VSBE**
Collaborative Communications	School Size Study	Woman-Owned, Not Certified
Early Childhood Policy Research	Prekindergarten Study	Woman-Owned, Federally Certified
Humann Consulting	School Size Study	Woman-Owned, Not Certified
Leading Edge	Case Studies and Professional Judgment Panels	VSBE, Maryland Certified
Time Printers	Administrative	Minority-Owned, Maryland Certified
William Hartman, Pennsylvania State University	Impact of Enrollment Study	N/A

Collaborative Communications

Collaborative Communications, a Washington, D.C. based firm that focuses solely on education and learning, will be supporting the school size study, specifically in geographic information systems. The firm is a woman-owned business. The Collaborative team members include Shawn Stelow Griffin, Katherine Ward and Chris Givens.

- Ms. Stelow Griffin brings 20 years of experience designing and implementing education reform initiatives at the local, state and federal level. Shawn previously worked at The Finance Project, where she served as Vice President of Education and Children's Services. There she co-authored the Washington DC Education Adequacy Study, a comprehensive study of the adequacy of the current per student funding formula as well as the adequacy of the current capital and operational funding policies.
- Ms. Katherine Ward is an experienced project manager and strategist for government, corporate and non-profit clients. She currently leads the strategy and development of LearnDC.org, an initiative of the Office of the State Superintendent of Education of the District of Columbia (OSSE), that offers information about local schools, resources about what's happening in classrooms and strategies and services to support young children.
- Mr. Chris Givens integrates technology, interactivity and multimedia solutions into a variety of technical topics. He has expertise in information design and data visualization, and he prototypes and develops solutions to complex presentation challenges. Most recently, he served as information design lead for the DC Office of the State Superintendent of Education's LearnDC School Profiles website, crafting the visual language of the site with the goal of empowering a broad audience to understand and take action based on school data.

Early Childhood Policy Research

The Early Childhood Policy Research center is a federally certified woman-owned firm. Anne Mitchell will be working on the prekindergarten study with APA. She will be consulted for her expertise on the cost of getting children to be kindergarten ready. Ms. Mitchell is the president of Early Childhood Policy Research, an independent consulting firm specializing in evaluation, policy analysis and planning on early care and education. She is also the co-founder (with Louise Stoney) of the Alliance for Early Childhood Finance, a learning community on finance reform and system-building for early care and education. She is an expert on preschool quality and funding and has worked closely with a number of states to help implement QRIS systems and to cost-out expansions of state or city prekindergarten programs, including recently in Rhode Island, Cleveland, OH and Seattle, WA. Ms. Mitchell is a co-author of the 2004 report "The Price of School Readiness: A Tool

for Estimating the Cost of Universal Preschool in the States", and the 2008 report "Meaningful Investments in Pre-K: Estimating the Per-Child Costs of Quality Programs."

Ms. Mitchell is a Past-President of the National Association for the Education of Young Children and completed five years on the State Professional Standards and Practices Board for Teaching appointed by the New York State Board of Regents. Ms. Mitchell received her B.S. degree (1972) in astronomy from Wellesley College, her M.S. degree (1988) in early childhood education leadership from Bank Street College of Education and an honorary certificate in Early Childhood Leadership Development (1995) from the University of North Carolina at Chapel Hill.

Humann Consulting

Cheryl Humann will be conducting and writing the school size study. Ms. Humann is the owner of Humann Consulting, LLC, and is a registered professional engineer who has over 25 years in the planning, construction and operations of facilities with 15 years specific to K-12 organizations. Ms. Humann has been a member of the Council of Educational Facility Planners International for over 20 years. Most recently Ms. Humann was the executive director of facilities for Jefferson County School District (Jeffco) the largest school district in Colorado with over 85,000 students. From 2009 through 2011 Ms. Humann led the effort for the Jeffco district to complete a facilities utilization study, and as a result of that process, to develop a long-range facilities master plan for the district, both of which included significant community engagement.

Leading Edge

Leading Edge will be supporting the case studies and professional judgment panels. Specifically, they will help coordinate site visits and interviews. Leading Edge Solutions, LLC, is a Business Management and Technology Consulting firm that specializes in creating innovative solutions to enhance competitive advantage in the global market space. Leading Edge is a certified Service Disabled Veteran Owned Small Business (SDVOSB).

Leading Edge is experienced in and actively participating in research and development across a range of subjects of interest to or in support of Navy programs. This research has been or is being performed in support of the Chief of Naval Operations (CNO), Assistant Secretary of the Navy for Research Development and Acquisition, Chief of Naval Research, as well as for commercial clients.

Leading Edge has extensive experience working with educational organizations at the middle school, high school and undergraduate level. Leading Edge supports the middle school supplementary educational program sanctioned by the Alexandra Public School Systems. Leading Edge is responsible for coordinating the participation of high school

students from over eighteen high schools in the Maryland, Washington DC and Northern VA area in the annual Black Engineer of The Year Mentoring program. In the past two years over 600 students have participated in the BEYA Mentoring program. Over the past four years Leading Edge has supported a very successful Historically Black College and University (HBCU) College Fair. The HBCU College Fair in its 12th year of existence and attracts over 68 HBCUs and averages over 2500 students in attendance annually.

Time Printers

Time Printers will be subcontracted for report design and printing of project reports. It is a Maryland registered minority-owned business enterprise. They have extensive knowledge of the industry and deep seeded Baltimore community roots. Employees bring unique qualities to the company that allows them to build upon its reputation in the community by combining quality products, quick turn around and outstanding customer service.

In 2009, Al Maddox Jr., President of Time Printers, became the first African American to serve as the Chairman of the Board of any print trade association in the United States when he assumed the position in the Printing and Graphics Association Mid Atlantic. Time Printers is on the cutting edge of the industry's standards without giving up their personal touch. They offer their clients the newest technology while at the same time adhering to their extensive history and timeless traditions.

William T. Hartman, Pennsylvania State University

William Hartman will contribute to the study on the impact of increasing and declining enrollment. He will be part of the analysis and writing of the report. Mr. Hartman was the director of "Analysis of Student Transportation Operating Practices and Spending," a component of the Pennsylvania costing out study. He also directed the "Study of State Transportation Subsidy to Districts" and "Analysis of Transportation Policies, Operating and Fiscal Procedures," a component of the North Carolina costing out study. He is the founding member of PASBO Benchmarking committee that designed and implemented a transportation benchmarking survey for Pennsylvania. He has been involved in a variety of projects for state departments of education and school districts involving financial modeling and simulations of basic education and special education funding formulas.

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4.4.3.14 Legal Action Summary

APA has never had any outstanding legal actions, potential claims or judgments against APA.

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4.4.3.15 Economic Benefit Factors

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This project will result in accrual of considerable economic benefits to Maryland. Because the RFP explicitly requests that we not include "actual fees or rates paid to subcontractors or information from our Financial Proposal," we discuss these benefits as a percentage of our total budget, including travel.

The primary economic benefit will be the 16% of our total budget that represents subcontracts to three Maryland based firms or entities. We have signed agreements from these firms to conduct this work, which is the industry standard for a high level of commitment prior to the awarding of the contract. These firms will be conducting data collection, research, analysis, project support and printing within Maryland as part of this project. These firms or entities include a minority-owned business (Time Printers), a veteran-owned business (Leading Edge) and the University of Maryland Equity Project.

Another significant economic benefit that will accrue to Maryland is the 10% of our total budget that is allocated to travel- and meeting-related expenses within the state. Because of our extensive data collection throughout Maryland and stakeholder engagement, we plan 72 trips to Maryland over the contract period. Our calculation of benefits accrued to Maryland from travel does not include airfare. Included in this calculation are meeting expenses that include paying for substitute teachers while full time teachers attend interviews.

We do not have an estimate of tax revenue that will accrue to the state of Maryland or other jurisdictions within Maryland from this project. We would expect the tax revenue to include sales taxes on our travel expenses and income taxes on Maryland residents who work at one of the subcontracted Maryland businesses or entities. We note that there is an additional subcontract with a Washington D.C. based firm that may also have Maryland residents.

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4.4.2 Additional Required Technical Submissions

- Bid/Proposal Affidavit (Attachment B)
- Maryland Living Wage Requirements Affidavit of Agreement (Attachment G-1)
- MDOT Certified MBE Utilization and Fair Solicitation Affidavit (Attachment D-1)
- Conflict of Interest Affidavit and Disclosure (Attachment I)
- Veteran-Owned Small Business Enterprise (VSBE) Utilization Affidavit and Subcontractor Participation Schedule (Attachment M-1)
- Non-Disclosure Agreement (Attachment J-1 and J-2)