

**A PROFESSIONAL JUDGMENT APPROACH TO  
SCHOOL FINANCE ADEQUACY IN KENTUCKY**

Prepared for  
The Kentucky Department of Education

by  
Lawrence O. Picus and Associates,  
Lawrence O. Picus  
Allan Odden  
Mark Fermanich

May 2003

# **A PROFESSIONAL JUDGMENT APPROACH TO SCHOOL FINANCE ADEQUACY IN KENTUCKY**

This document is the second of two reports prepared by Lawrence O. Picus and Associates for the Kentucky Department of Education estimating the costs of financing an adequate education in Kentucky. The first report (Odden, Fermanich & Picus, 2003) completed in February, 2003 relied on a state-of-the-art or evidence-based approach to estimating the level of funding needed to provide an adequate education for all Kentucky school children. Using the evidence based approach, Odden, Fermanich and Picus estimated that it would cost an additional \$565 million to provide an adequate education to current K-12 students in Kentucky, and an additional \$175 million to include a preschool program for all 3 and 4 year olds living below 150 percent of the poverty level. This represents a total increase in spending of approximately \$740 million over current net expenditures of \$3.9 billion. The model assumed the same length school year and that teacher salaries remained at current levels.

This document reports the results of a second estimate of school finance adequacy, this time relying on what is known in the literature as a professional judgment model. To reach our estimates using this approach, we sought input from nine panels of professional educators from across Kentucky on what an adequate system might look like, and then estimated the cost of that system. Our estimates of the increased cost of an adequate education using the professional judgment models developed by our panels is \$1.8 billion over current net expenditures of \$3.9 billion. In addition, we estimate the

costs of increasing average teacher salary to the national average, adopting a 3:1 student to computer ratio for technology, and adding preschool programs for 3 and 4 year old children living below 150 percent of the poverty level would add an additional \$0.5 billion for a total increase of \$ 2.3 billion a year. Below, we describe the background for this study, the alternative methods available for conducting studies of this type, and our findings.

## **1. BACKGROUND**

Kentucky's SEEK school finance program was the first in the country to be designed to provide an "adequate" funding base for each school within the state. In response to the Kentucky Supreme Court's ruling in Rose v. Council for Better Education, [790 S.W. 2d 186 (Kent. 1989)], which stated that the funding system must be adequate, substantially uniform and provide an equal opportunity for all children in Kentucky, the General Assembly created a comprehensive new educational system. Among its components were: content standards that prescribed the curriculum to be taught all students; a new testing system that measured student learning related to those content standards; an aligned accountability system that offered rewards for schools making progress towards those standards, help for struggling schools, sanctions for schools continuously failing to make progress, and the SEEK school finance formula for providing the needed educational resources in a manner that was both equitable and adequate.

Earlier this year, the authors conducted an initial adequacy study (Odden, Fermanich and Picus, 2003) estimating the costs of implementing a model of whole school reform across every school in Kentucky. As discussed above, this resulted in an estimated need for

an additional \$740 million to implement this program across the state and provide early childhood programs for 3 and 4 year olds living below 150 percent of the poverty level.

In 2001, the authors conducted a ten year analysis of the equity of the SEEK formula, concluding that equity had actually improved over the ten year period, and finding that in the 2000-2001 school year, the Kentucky SEEK formula met the benchmarks of several statistical measures for school finance equity (Picus, Odden & Fermanich, 2001). We further concluded that when the fiscal numbers were adjusted by weights used to reflect different student needs and by a geographic price of education index (that quantified the varying purchasing power of the educational dollar across geographic regions in Kentucky holding quality of education resources constant), the equity statistics beat the benchmarks by even wider margins. We concluded that while not perfect, the SEEK school finance formula was equitable according to standard definitions (Odden & Picus, 2000).

The SEEK formula is supposed to be adequate as well as equitable. However, the method used by the Kentucky Legislature to determine the initial “adequate” base SEEK revenue relied on what is essentially a “pragmatic” approach. As we understand it, the method used in 1990 was essentially to define "adequate" as all state funds that were then expended for public schools, increased by an estimated additional cost for all state mandates that at that time were unfunded, as well as all local dollars then spent for schools. For the 1990-91 year, that produced a SEEK Base Guarantee of \$2,305 per pupil. This value rose to \$2,994 per pupil for 2000-2001, which was just short of keeping pace with inflation over those eleven years. In 2000-2001 terms, a fully inflation adjusted SEEK Base Guarantee would have been \$3,160 per pupil (as the CPI rose by about 29 percent over the 1990s). Nevertheless, it would be fair to say that based on the

methodology used in 1990, the SEEK base was about as adequate in 2001 in real terms as it was a decade before in 1990-91.

But the adequacy issue today is not really whether the SEEK base has been appropriately adjusted by some inflation figure or is adequate relative to the 1990-91 base. Rather the adequacy question today is whether the SEEK base provides sufficient funding for each school in the state to deploy powerful enough educational strategies to meet the state's 2014 goals. Those goals seek to have all students performing at or above the proficiency level on the state's student testing system by 2014. This is a more complex and more substantive definition of adequacy than was used in 1990. Today, adequacy in Kentucky requires a more direct link between the funding base and educational strategies that have potential to allow Kentucky's students to meet or exceed the state's established proficiency levels. Since 1990, a variety of methods have been developed in different parts of the country that can help identify this linkage in both programmatic and fiscal terms. Today, a number of alternative methods for determining adequacy have been developed by the school finance community.

To help Kentucky policy makers better understand the many complex issues surrounding establishment of an adequacy level, the first section of this report describes the four primary methods for determining adequacy that have been developed over the past decade, and identifies the states currently using them. Section two then takes one of the approaches – the professional judgment approach, and describes how that approach was used to determine adequacy in Kentucky. Section three then begins to assess the adequacy of the SEEK formula using the professional judgment approach, which estimates the costs of educational resources described as being needed to insure most

school children in Kentucky will be able to meet the states proficiency standards by 2014. These costs are estimated for all of the A1 schools in Kentucky.

## **2. APPROACHES TO SCHOOL FINANCE ADEQUACY<sup>1</sup>**

Determining whether a state's school finance system is adequate is the newest and most dominant issue in school finance across the country (Ladd & Hansen, 1999). To be adequate, the school finance formula must provide sufficient of funds to enable schools to teach all – or at least all but the most severely disabled – students to state and district proficiency standards. This approach has great appeal for both policymakers and the courts; it seeks to link a funding level to a system performance level, a long sought goal.

But attractive though the adequacy goal is, it is not easy to define in specific, programmatic and dollar terms. Nevertheless, over the past ten years, education policy analysts have created four different methodologies for determining school finance adequacy (Ladd & Hansen, 1999; Odden & Picus, 2000):

- Economic cost function approach
- The successful district approach, i.e., identifying expenditure levels in districts/schools that meet performance benchmarks
- Professional judgment approach
- The evidence based, or the state-of-the-art approach.

Except for the cost function approach, different states are using various versions of the other three methods. Each is described in detail below.

---

<sup>1</sup> Much of the material presented here is repeated from our first adequacy study (Odden, Fermanich & Picus, 2003).

## **Economic Cost Function Approach**

The economic cost function approach relies on econometric techniques known as cost functions to estimate an adequate level of resources for schools. This method employs regression analysis with expenditure per pupil as the dependent variable, and student and district characteristics as well as *desired* performance levels as the independent variables.<sup>2</sup> The question this approach seeks to answer is: how much money per pupil is needed to produce a given level of student performance? The result produces an adequate expenditure per pupil for the average district. This figure could be used, for example, as the Base Guarantee portion of the SEEK formula. That amount is then adjusted by one overall “index” to account for differences in pupil need and educational prices, as well as diseconomies of both large and small size across districts. The expenditure level is higher (lower) as the expected performance level is increased (decreased). The index adjustment would replace all current SEEK add-ons, except for transportation.

No state currently uses this approach to determine adequacy, though cost function research has been conducted in New York (Duncombe, Ruggiero & Yinger, 1996; Yinger, 2001), Wisconsin (Reschovsky & Imazeki, 1999), Texas (Imazeki & Reschovsky, 1999; Reschovsky and Imazeki, 2002) and Illinois (Reschovsky & Imazeki, 2000). The Reschovsky and Imazeki cost function research found that the adequate expenditure levels in Wisconsin and Texas were close to the median spending levels in those states, when selecting state average performance as the student proficiency target. These studies indicated that there was substantial variation in the average adequacy level due to student and district needs, ranging from a low of 49 percent to a high of 460

---

<sup>2</sup> To economists, the cost function is the dual of a production function.

percent of the average in Wisconsin, and a low of 75 percent to a high of 158 percent of the average in Texas. In most states, the adequate expenditure level estimated for large urban districts was 2-3 times the level estimated for the average district.

Reschovsky and Imazeki (2001) produced an overall assessment of the utility of the cost function approach, arguing that it is the only approach, using data from all districts, which links a specific spending level to a specific performance level and thus is the preferred approach in a standards-based environment. The approach is limited however, by extant management, governance and education strategies, and does not capture efficiencies that could be produced by more dramatic re-engineering or restructuring. Further, the system is so complicated that state policymakers shy away from using it, as too few legislators or members of the taxpaying public understand how it works. Moreover, the procedure produces cost figures just at the *district* level. It has not been used at the *school* level, and conceptually it may not be possible to do so. Ultimately, it is the school level at which adequacy levels need to be determined.

### **The Successful District Approach, Or Linking Expenditure Levels in Districts/Schools That Meet Performance Benchmarks**

This method, which is being used in part by Ohio (Alexander, Augenblick, Driscoll, Guthrie & Levin, 1995; Augenblick, 1997), Illinois (Augenblick, 2001; Hinrichs & Laine, 1996), Maryland (Augenblick, 2001), and Mississippi, identifies districts that have been successful in teaching their students to state proficiency standards, and sets the adequacy level at the weighted average of the expenditures of such districts. Usually, atypical districts are eliminated from such analysis. Unfortunately, atypical districts generally include all *big city districts*, as well as very wealthy and very poor districts, and often very small rural districts as well. The result is that the districts identified in the

analysis are usually non-metropolitan districts of average size and relatively homogeneous demographic characteristics, which generally spend below the state average.

One major criticism of this approach is that the adequate expenditure level is not relevant to big city districts, even when adjustments for pupil needs and geographic price differentials are added to the base. This is because the districts identified as meeting the state standards under the successful district approach are often relatively small (approximately 3,000 students) school districts with a relatively homogeneous student population, making it hard to adjust the model to fit a large district of over 50,000 students with high percentages of poor and minority children. This approach also lends itself to manipulation. Though analysts suggest that the adequate expenditure level should be the weighted average of all the expenditures of the districts meeting the performance benchmark, some policymakers have suggested using the average of only the bottom half of that sample, using an unweighted average, or even using the value of just the lowest expenditure district in the sample – in order to drive down the value of, and thus the state cost of, the adequate foundation expenditure level.

Finally, these two different systems – cost function approach and successful district approach – produce widely varying estimates of an adequate expenditure level, suggesting that more research is needed to determine why the large differences emerge. While both the successful district and cost function approaches link spending levels to performance levels, which is what many policymakers want, neither of these two approaches indicate how funds distributed to school districts would be used. They theoretically identify an adequate revenue level, but are silent on the types of educational

strategies those funds could support. The next two approaches attempt to remedy this shortcoming.

### **Professional Judgment Approach**

A third approach to determining school finance adequacy is known as the professional judgment approach. Under this methodology, the state creates several teams of state and local education leaders who independently identify effective school wide strategies and their key ingredients – numbers of professional staff and other resources. The ingredients are then priced out and added up to determine the adequate fiscal base for a school; the base can then be adjusted for the differing characteristics of students and districts. Originally developed by Jay Chambers and Tom Parrish as the Resource Cost Model (Chambers & Parrish, 1983, 1994,) the professional judgment model (Guthrie & Rothstein, 1999) is being used in Oregon (Calvo, Picus, Smith & Guthrie, 2000), Maine, Maryland (Management Analysis & Planning, 2001a; Augenblick, 2001) and Wyoming (Guthrie, 1997; Management Analysis and Planning, 2001b). Adequacy studies using this approach are being conducted or have just been completed in a number of other states including Kansas (Augenblick, Meyers, Silverstein & Barkis, 2002), Montana (Meyers & Silverstein, 2002), Nebraska, New York and South Carolina.

The basis of this approach is to bring together a group of educational professionals, ask them to identify the components of a “prototype” school that they believe would enable the professional staff to teach the students at that school to some predetermined standards level. Though this approach usually identifies effective educational strategies to some degree, and so provides a stronger linkage between funding levels and possible education programs, its major limitation is that it depends on

the judgments of educational professionals in identifying strategies rather than research that actually shows a linkage between the strategy and student performance. Further, it sometimes provides for little differentiation between strategies for the average school and strategies for schools with higher concentrations of at-risk students (see for example, Management Analysis and Planning, 2001a).

Nevertheless, it is becoming one of the most popular methods states are using to determine school finance adequacy. This model is used to estimate the costs of school finance adequacy in Kentucky in this study.

### **The Evidence Based Approach<sup>3</sup>**

The fourth approach takes research findings often though not always embodied in a high performance, or a comprehensive school design, identifies all the ingredients needed for all research identified educational strategies, determines a cost for each of those ingredients, and then uses that figure to determine an adequate spending base for each school. This system was developed in part because it identifies a set of specific educational programs and strategies that represent state-of-the-art knowledge about education effectiveness and puts a dollar figure on their costs. It combines many of the advantages of the preceding methods:

1. Because each comprehensive school design draws upon research that links several educational strategies to student performance, this method has a pragmatic orientation;
2. By drawing upon the compilation of strategies incorporated into several comprehensive school designs, it taps the craft wisdom of some of the best

---

<sup>3</sup> This section draws from Odden, Archibald & Fermanich, 2003.

educators in the country who have compiled research on individual educational strategies into comprehensive, school wide strategies;

3. When used, this approach provides schools with a funding level that allows them to deploy any of a large number of school wide educational strategies. Each of those strategies represents the best of what both research and top practitioners claim are the most effective educational strategies and represent current state-of-the-art professional knowledge in education.

Odden (1997) identified the costs of seven school wide designs that were created by the New American Schools. In subsequent analyses he showed how via resource reallocation, they were affordable at schools spending at the average or median level of expenditure per pupil in the United States (Odden & Busch, 1998; Odden & Picus, 2000). His analysis, however, did not include adequate planning and preparation time for teachers and did not standardize costs across various designs, so his 1997 cost figures are underestimated.

New Jersey adopted this approach to adequacy in 1998 when its Supreme Court concluded that state's school finance system was adequate because it provided more than sufficient funds for schools to adopt and fund via resource reallocation an enriched version of the most expensive comprehensive school design – the Roots and Wings/Success for All design. Since Roots and Wings, along with the Modern Red Schoolhouse, are the most expensive school designs now on the market, funding in New Jersey was not only adequate for these designs, but there was enough money for any of the other school wide educational designs as well (Odden, 1998).

The last step in both the professional judgment and the evidence-based approach is appropriately pricing all ingredients, and setting teacher salaries. This is a step that usually uses a statewide average teacher salary, but such a strategy potentially understates or overstates what districts and the state might need to pay for quality teacher talent.

There are two approaches to estimating a teacher salary that reflect what it actually takes in dollar terms to recruit and retain teaching talent. The first is to apply to the state's average teacher salary a cost-of-education-index that has been developed by the National Center for Education Statistics. This district level index quantifies the different prices school districts in a state – such as Kentucky – must pay for a given set of teacher qualities. This adjustment insures equal purchasing power of teacher salary dollars across geographic regions in the state.

But this cost-index approach just quantifies price differences across regions/districts within a state; it does not indicate what the state average *should be* in relationship to the labor markets for teacher talent within which a state's districts compete for those teachers. A second pricing strategy, which this study is not able to deploy, is to determine salary benchmarks by labor market regions in a state; this approach would identify not only the salary benchmark for beginning-teachers, but also benchmarks for mid-career and top-career teacher salaries. And the benchmarks would be calculated for the various labor markets within which the state's districts compete for teachers.

All four of the above methods could be used to determine the adequacy of the SEEK spending base. This report presents analyses of school finance adequacy using the professional judgment approach.

### **3. APPLYING THE PROFESSIONAL JUDGMENT APPROACH IN KENTUCKY**

As described above, the professional judgment approach relies on the knowledge and experience of educators to specify the educational resources needed to have a reasonable assurance that all – or almost all – of the school children in a state will be able to meet that state’s educational proficiency standards. The typical result of this approach is the development of a prototype school (or schools) that in the professional judgment of the panel members will meet this requirement. To implement this approach, we empanelled nine groups of Kentucky educators between January and March 2003. The panels were organized as follows:

- Six school level panels, two each for elementary, middle and high schools
- Two district level panels
- One state level panel.

Three of the school level panels representing Eastern Kentucky schools (one at each level) met on January 7-8, 2003 in Richmond, Kentucky. The other three school level panels, representing Western Kentucky schools met on January 22-23, 2003 in Bowling Green, Kentucky. The two district level panels met on February 12, 2003 in Lexington, and the state level panel met on March 5, 2003 also in Lexington.

Staff from Picus and Associates attended all of the panel meetings and served as moderators for each panel. Staff included Lawrence O. Picus, Allan Odden and Mark Fermanich. In addition, staff from the Kentucky Department of Education attended each of the sessions to observe the discussions. Susan Goins of the Department’s staff helped moderate one of the district panel discussions on February 12.

Each panel member received a folder containing instructions for the day and resource materials to help them in their work. Each folder contained the following materials:

- Welcome letter
- Agenda
- Instructions for panel members
- A fact sheet about Kentucky K-12 education
- Seven Capacities of an Efficient System of Common Schools as established by the Kentucky Supreme Court in *Rose v. Council for Better Education, Inc.*,
- Two information pamphlets describing Kentucky's proficiency standards.

Appendices A-1 through A-4 contain copies of these materials for each of the panel sessions. Appendix B lists the names of each of the individuals who participated in the professional judgment panels.

In addition to these materials, copies of the Kentucky State Board of Education's Annual Report for 2001 and the Board's Strategic Plan were provided to each panel to use as a resource during their discussions. These documents are available on the State Board's website at:

<http://www.kde.state.ky.us/KDE/Administrative+Resources/Kentucky+Board+of+Education/default.htm>

Our role as moderators was to direct the discussion to insure that all of the topics posed in the agenda and instructions were adequately discussed during the allotted time, and to take careful notes on the recommendations of the panels. We were careful not to advocate for inclusion or rejection of certain types of resources, and it is important to note that the outcome of these discussions represents the professional judgment of the

panel members who participated in the discussions, and does not necessarily reflect the views or opinions of Picus and Associates or our staff

Each of the school level panels was asked to produce a comprehensive set of school resources for each of elementary, middle and high schools. We then presented these prototype models to the district panels, which were asked to suggest modifications for each of the school designs, as well as suggest a prototypic district design. We then produced a synthesis of the proposed school and district designs and provided these syntheses to the state panel, which recommended further modifications.

The result of these nine panel discussions was a set of prototype school designs that our panel members believe would provide adequate resources to meet Kentucky's student proficiency goals by the year 2014. Table 1 displays the prototype designs developed for elementary, middle and high schools. The table lists core instructional resources as identified by the panels. During the discussions with the state level panel, in conjunction with the recommendation of Commissioner Wilhoit, it was agreed that for the purpose of the cost estimates generated for this study, current expenditures for central office administration, pupil transportation operations and maintenance, and special education for severely disabled children would be used rather than attempt to estimate a prototype district model, or models for these other functions.

The next section describes our estimates of the costs of providing the resources to meet these prototypical school designs in Kentucky. In addition to the estimates of this design, we add the costs of providing pre-school programs for 3 and 4 year old children at 150 percent of the poverty level or below.

**Table 1**  
**Kentucky Prototype School Design**

Element	Elementary	Middle	High School
<b>School Characteristics</b>			
School Size	400	500	800
Average Class Size (Core Inst.)	15 for K-3; 20 for 4-5	20 see regular instruction below	20 (this allows for very small classes i.e. AP as well as larger classes for band and PE etc.)
School Year for students	180 days	180 days	180 days
Teacher Contract length	200 days for all three levels. In addition to the current year of 185 days, 5 days are added for the longer year for students, and an additional 10 days are added for professional development, largely for 10 days of summer training institutes.		
Instructional Day	About 6 hours daily with time for planning and preparation. The instructional day/week should total 360 x 5, or 2100 minutes a week, with a total of about 250 minutes a week for planning and preparation time for teachers (the latter is equivalent to 1 50 minute period per day).		

**Table 1 (continued)**  
**Kentucky Prototype School Design**

<b>Element</b>	<b>Elementary</b>	<b>Middle</b>	<b>High School</b>
Student Characteristics	10 % moderate disability plus speech/language; 50% free and reduced price lunch; 15 English Language Learners children	10 % moderate disability plus speech/language; 50% free and reduced price lunch; 15 English Language Learners children	10 % moderate disability plus speech/language; 50% free and reduced price lunch; 15 English Language Learners children
<b>Cost Elements (Personnel)</b>			
Administration			
Principal	1 (12 month)	1 (12 month)	1 (12 month)
Assistant Principal		1	1
Teachers			
Regular Instruction	18 regular K-3 teachers 6 regular teachers 4-5	25, which is sufficient for a variety of scheduling structures.	40, which is sufficient for a variety of scheduling structures.
Specialist Teachers	~5 (20 % of regular teachers for art, music, PE, library, etc.)	~5 (20 % of regular teachers for art, music, PE, etc.)	~8 (20 % of regular teachers for foreign language, art, music, PE, etc.)

**Table 1 (continued)**  
**Kentucky Prototype School Design**

<b>Element</b>	<b>Elementary</b>	<b>Middle</b>	<b>High School</b>
Curriculum Specialist/Site Based Professional Development Coach/HS Department Chairs	1	1	2
Pupil Support	3 positions to cover health, guidance and coordination of the family resource center	4.5 to cover guidance services, health services, social worker/psychologist, security, and family/youth services	8 positions for guidance, youth services, athletics, family outreach, dropout prevention services, attendance, security, etc.

**Table 1 (continued)**  
**Kentucky Prototype School Design**

<b>Element</b>	<b>Elementary</b>	<b>Middle</b>	<b>High School</b>
Special Education Struggling Students	2 professional tutor types 2 learning support for K-3 2 learning support for 4-5 One speech/hearing specialist Total of 7 certified personnel to handle mild and moderate disabilities and struggling students. Number of tutors to vary by % poverty; minimum of one, maximum of 4.	7 learning support personnel, one for each of the 6 teams plus 1 floating certified staff member and a ½ time speech/hearing specialist 1 reading specialist If more than 75% of students in poverty, one more reading specialist-	8 includes GATE
English Language Learners	1 teacher for every 15 English Language Learners students	1 per 15 English Language Learners students	1 teacher for every 20 English Language Learners students

**Table 1 (continued)**  
**Kentucky Prototype School Design**

<b>Element</b>	<b>Elementary</b>	<b>Middle</b>	<b>High School</b>
Technology	1 technology person at the school site, ½ time instructional, ½ time technical	1 technology person at the school site, ½ time instructional, ½ time technical	2 technology people at the school site, 1 instructional, 1 technical
Media/Library	0; the position is included above in the specialist positions	1	2
Gifted and Talented	Included as part of the responsibility of the curriculum specialist or learning coordinators	Included as part of the responsibility of the curriculum specialist or learning coordinators	
Extra Duty Assignments		\$60 per student	\$120 per pupil
Substitutes	Typical use for illness plus adequate number of days for Professional Development during the school year including 1 full time permanent substitute	1 full time permanent substitute plus typical use for illness plus adequate number of days for Professional Development during the school year	2 full time permanent substitutes plus typical use for illness plus adequate number of days for Professional Development during the school year
Alternative School Staff			One position for every 8 students

**Table 1 (continued)**  
**Kentucky Prototype School Design**

<b>Element</b>	<b>Elementary</b>	<b>Middle</b>	<b>High School</b>
Classified Staff			
Classroom Aides	1 classroom aid for every 50 students to be used as determined at the school site	No classroom aides	No Classroom aides
Clerical Staff	4.5 including one 12 month office manager.	6 including one 12 month office manager. (examples of duties include secretary, receptionist, finance, attendance, pupil support, media center and family resource center)	8 including one 12 month office manager, others include clerical support for guidance, receptionist, bookkeeper, attendance and the multi-media center.

**Table 1 (continued)**  
**Kentucky Prototype School Design**

Element	Elementary	Middle	High School
<b>Cost Elements (Dollars Per Pupil)</b>			
Professional Development	10 extra days for Summer Institutes included in expanded school year. Additional professional development provided by curriculum specialist included above, considerable collaborative planning during planning and preparation times. Plus \$50 per student for travel, consultants, materials, etc.		
Technology	\$214/pupil for hardware/software replacement and repair \$50 per pupil for moving to ratio of 1 computer for every 3 students		
Instructional Materials	\$250 per pupil		

## **ESTIMATING THE COST OF THE PROTOTYPE SCHOOL MODELS**

This section describes the process we used to estimate the costs of an adequate education using the prototype school models developed by the nine professional judgment panels.

### **Cost Strategy**

Before providing detailed descriptions of the assumptions we used in reaching our cost estimate, it is helpful to understand the conceptual approach we used. Our strategy in estimating the costs of an adequate education under the prototypes developed by the professional judgment panels was as follows:

1. Determine the total costs for school year 2001-02.
2. Subtract from that total the amount spent on functions that would be replaced with new cost estimates based on the elements identified through the professional judgment model. These included:
  - a. 1000 – Instruction
  - b. 2100 – Student support services
  - c. 2200 – Instructional staff support services
  - d. 2400 – School administration support services
3. The remainder was that portion of total expenditures left unchanged from current spending. To that remaining figure we added the following:
  - a. Low incidence special education teachers (40% of all exceptional child teachers)
  - b. Other central office staff previously accounted for in functions 2100 and 2200. The number added back was based on a prototype district of 3,500

students and prorated up or down depending on actual district enrollment.

Staff treated in this manner included:

- i. 1.0 Assistant superintendent for curriculum and instruction
  - ii. 1.0 Special education coordinator
  - iii. 2.0 Program coordinators
  - iv. 1.0 School psychologist
  - v. 2.5 Secretaries/clerical
4. To this figure we added the new costs of the previously subtracted functions (core instruction, instructional support, pupil support and school-based administration) based on the prototype models outlined in Table 1.
  5. We then made adjustments for geographic cost differences across Kentucky using the index developed by Chambers (1995).
  6. We then added the costs of additional staff days for the longer school year and additional professional development.
  7. Finally, we added the costs of providing pre-school programs for 3 and 4 year olds living at 150 percent of the poverty level or below, the cost of increasing teacher salaries to the national average, and the costs of improving the student computer ratio to 3:1.

The details of this approach are described below.

### **Proration of Cost Elements Based on Actual School Size**

The prototype models described in Table 1 specify prototype schools with 400 elementary school students, 500 middle school students and 800 high school students.

Obviously not all Kentucky schools have enrollments that exactly match these prototype

models. To estimate the costs of the resources needed in each school, we prorated the staffing and cost elements based on the actual size of the school. For schools larger than the enrollment specified in the prototypes, we prorated up proportionally. For schools smaller than the enrollments specified in the prototypes, we typically prorated down proportionally, but specified some minimum enrollment level below which the school continued to receive resources at the level it would generate if its enrollment were at that minimum. The specific decision rules we used in prorating resources for our cost estimates are described below.

*Elementary Schools (grades K-5, prototype enrollment of 400)*

1. Principals: One for each school regardless of size. Salary increased to reflect 12-month contract.
2. Assistant principals: None
3. Curriculum specialists: One prorated with a minimum of 0.5 (enrollment of 200) and no maximum.
4. Regular teachers: 15:1 class size for K-3, 20:1 for higher grades with no minimum or maximum enrollment (and thus number of regular teachers) established.
5. Specialist subject teachers: 20 percent of classroom teachers, minimum based on a minimum enrollment of 200 students.
6. Tutors: One tutor for each 25 percent of students in poverty with a minimum of one tutor and no maximum.
7. Special Education: Four teachers prorated up or down with a minimum of one and no maximum.

8. Speech: One speech professional prorated with a minimum of 0.5 (enrollment of 200) and no maximum.
9. English Language Learners: One teacher prorated with a minimum of 0.5 (enrollment of 200) and no maximum.
10. Media/Library: None, included in the specialists.
11. Permanent substitutes: One permanent substitute prorated with a minimum of 0.5 (enrollment of 200) and no maximum.
12. Technology Teachers: One position prorated with a minimum of 0.5 (enrollment of 200) and no maximum.
13. Pupil Support: Three positions prorated with a minimum of 1.5 (enrollment of 200) and no maximum.
14. Aides: One aid for each 50 students with no minimum or maximum.
15. Extra Duty Stipends: None
16. Substitute days: Assume 11 days per teacher net of the days covered by the permanent substitute teacher on staff. This figure is adjusted for enrollment with no maximum or minimum.
17. Other expenditures (assumes a minimum of 200 students and no maximum enrollment):
  - a. Professional development: \$50 per pupil
  - b. Technology: \$214 per pupil
  - c. Instructional materials: \$250 per pupil

*Middle Schools (Grades 6-8, prototype enrollment of 500)*

1. Principals: One for each school. Salary adjusted for 12-month contract.

2. Assistant Principals: One for a school of 500 prorated up or down with no minimum or maximum.
3. Curriculum specialists: One prorated with a minimum of 0.5 (enrollment of 250) and no maximum.
4. Regular teachers: Ratio of 20:1 with no minimum or maximum.
5. Specialist subject teachers: Ratio of 20 percent of regular teachers, with a minimum of 2 (school of 200) and no maximum.
6. Tutors/Reading Specialists: Minimum of 1 teacher plus 1 additional teacher prorated with no minimum or maximum for schools with a concentration of poverty exceeding 75%.
7. Special Education: 7 teachers prorated up and down with a minimum of 1 and no maximum.
8. Speech: A base of 0.5 speech professionals, prorated up or down with the minimum of 0.2 (enrollment of 200) and no maximum.
9. English Language Learners: A base of 1.0 FTE prorated up or down with a minimum of 0.4 (enrollment of 200) and no maximum.
10. Media/Library: A base of 1.0 FTE prorated up or down with a minimum of 0.4 (enrollment of 200) and no maximum.
11. Permanent Substitutes: A base of 1.0 FTE prorated up or down a minimum of 0.4 (enrollment of 200) and no maximum.
12. Technology Resource Teacher: A base of 1.0 FTE prorated up or down a minimum of 0.4 (enrollment of 200) and no maximum.

13. Pupil Support Personnel: A base of 4.5 FTE prorated up or down with a minimum of 1.8 (enrollment of 200) and no maximum.
14. Instructional Aides: none
15. Other expenditures (assumes a minimum of 200 students and no maximum enrollment):
  - a. Professional development: \$50 per pupil
  - b. Technology: \$214 per pupil
  - c. Instructional materials: \$250 per pupil
  - d. Extra Duty stipends: \$60 per pupil
16. Substitute days: Assume 11 days per teacher net of the days covered by the permanent substitute teacher on staff. This figure is adjusted for enrollment with no maximum or minimum.

*High Schools (Grades 9-12, prototype enrollment of 800)*

1. Principals: One for all schools. Salary adjusted for 12-month contract.
2. Assistant Principal: One for a school of 800, prorated up or down with no minimum or maximum.
3. Curriculum specialists: Two prorated with a minimum of 0.5 (enrollment of 200) and no maximum.
4. Regular teachers: A ratio of 20:1 with no minimum or maximum.
5. Specialist subject teachers: Ratio of 20 percent of regular teachers, with a minimum of 2 (enrollment of 200) and no maximum.
6. Tutors: None

7. Special Education: 8 teachers prorated up or down with a minimum of one and no maximum.
8. Speech: Included in 8 special education teachers listed above in necessary.
9. English Language Learners: A base of 0.75 (enrollment of 200) and no maximum.
10. Media/Library: 2.0 FTE prorated up or down with a minimum of 1.0 (enrollment of 400) and no maximum.
11. Permanent Substitute: 2.0 FTE prorated up or down, with a minimum of 0.5 (enrollment of 200) , and no maximum.
12. Technology Resource Teacher: 2.0 FTE prorated up or down a minimum of 0.5 (enrollment of 200) , and no maximum.
13. Pupil Support Personnel: 8.0 FTE prorated up or down with a minimum of 2.0 (enrollment of 200) , and no maximum.
14. Aides: None
15. Other expenditures (assumes a minimum of 200 students and no maximum enrollment):
  - a. Professional development: \$50 per pupil
  - b. Technology: \$214 per pupil
  - c. Instructional materials: \$250 per pupil
  - d. Extra Duty stipends: \$120 per pupil
16. Substitute Days: Assume 11 days per teacher net of the days covered by the permanent substitute teacher on staff. This figure is adjusted for enrollment with no maximum or minimum.

### *K-12 Schools*

1. Principals: One for each school. Salary adjusted for 12-month contract.
2. Assistant principals: 1 for each 500 students prorated up or down with no minimum or maximum.
3. Curriculum specialists: One prorated with a minimum of 0.5.
4. Regular teachers: 15:1 class size for K-3, 20:1 for higher grades with no minimum or maximum enrollment (and thus number of regular teachers) established.
5. Specialist subject teachers: Ratio of 20 percent of regular teachers, with a minimum of 2 (enrollment of 200) and no maximum.
6. Tutors: One tutor for each 25 percent of students in poverty (or each 100 students for larger schools) with a minimum of one tutor and no maximum.
7. Special Education: 7 teachers prorated up and down with a minimum of 1 and no maximum.
8. Speech: A base of 0.5 FTE speech professionals, prorated up or down with a minimum of 0.2 (enrollment of 200) and no maximum.
9. English Language Learners: A base of 1.0 FTE prorated up or down with a minimum of 0.4 (enrollment of 200) and no maximum.
10. Media/Library: A base of 1.0 FTE prorated up or down with a minimum of 0.4 (enrollment of 200) and no maximum.
11. Permanent Substitutes: A base of 1.0 FTE prorated up or down with a minimum of 0.4 (enrollment of 200) and no maximum.

12. Technology Resource Teacher: A base of 1.0 FTE prorated up or down with a minimum of 0.4 (enrollment of 200) and no maximum.
13. Pupil Support: Base of 6.0 prorated up or down with a minimum of 2.4 (enrollment of 200) and no maximum.
14. Aides: 1.0 per 50 pupils in grades K-5 with no minimum or maximum.
15. Other expenditures (assumes a minimum of 200 students and no maximum enrollment):
  - a. Professional development: \$50 per pupil
  - b. Technology: \$214 per pupil
  - c. Instructional materials: \$250 per pupil
  - d. Extra Duty stipends: \$90 per pupil
16. Substitute Days: Assume 11 days per teacher net of the days covered by the permanent substitute teacher on staff. This figure is adjusted for enrollment with no maximum or minimum.

### **Additional Cost Assumptions**

This section details the cost assumptions that were made in estimating the total cost of the professional judgment model as established by the nine panels.

#### *Schools in the Analysis*

There were a total of 1, 739 schools in our analysis. Table 2 provides a breakdown by type of school.

**Table 2**  
**Number of Schools In Used in Computing the Estimated Costs**  
**of the Kentucky Professional Judgment Model (2001-02 school year)**

<b>Type of School</b>	<b>Number of Schools</b>
Elementary	779
Middle School	214
High School	235
Alternative Schools	506
Total Number of Schools	1,739
Total enrollment	646,854

*Actual and Proposed School Year*

Table 3 displays the proposed changes in the length of the school year for teachers. The current model of 175 student instructional days and 185 teacher contract days was increased to 180 instructional days and 200 contract days. It is estimated that this change would cost \$250.8 million without any changes in the current level of teacher salaries. In addition, classified staff were assumed to work an additional five days a year for a cost of \$5.9 million. Again, no pay increases were included in this estimate. As a result, the estimated cost of increasing the length of teacher contracts and increasing the number of days worked by classified staff amounts to \$256.7 million.

**Table 3**  
**Comparison of current school year with Proposed School Year**  
**Kentucky Professional Judgment Model**

<b>Category</b>	<b>Current</b>	<b>Proposed</b>	<b>Difference</b>
Student Instructional Days	175	180	5
Teacher Contract Days	185	200	15

## **Estimating the Costs of Each Component of the Professional Judgment Model**

Table 4 details the total costs for each component of the professional judgment model. This is the portion of the cost model that replaces existing expenditures. The figures represent estimated costs for teachers, specialists and other personnel using the prototype models specified in Table 1 and adjusted for actual enrollments as described above. Estimated expenditures unadjusted for the NCES Cost Index for the components of the professional judgment model total \$3.955 billion.

Table 5 summarizes the total costs derived using the professional judgment model. The first section of the table details the expenditure functions that were left intact in our analysis. A total \$1.57 billion in current spending was left unchanged in our analysis. This includes most components of school district central offices. The row numbered 3 in the row number column summarizes this total. The row numbered 4 provides the total for those expenditure functions that were replaced by the professional judgment model. This represented a total of \$2.48 billion. We then added the total derived in Table 4 -- \$3.956 billion to the \$1.57 billion to arrive an estimated total for K-12 expenditures under the plan devised by the professional judgment panels of \$5.26 billion. This figure was then adjusted for regional cost differences with the final total reaching \$5.72 billion.

This figure assumes that teachers have a longer school contract year, and that the extra pay for those days of work will bring Kentucky teacher salaries to the Southern Regional Education Board (SREB) average salary without increasing salary levels.

The last page of table 5 shows what it would cost to adopt the national school average teacher salary and add that to the model. Other cost items include providing 3

and 3 and 4 year olds living below 150 percent of the poverty level with preschool, and improving the student to computer ratio. If all of these items were included, the total cost under this model would be \$6.2 billion, an increase of \$2.3 billion.

**Table 4**  
**Estimated Costs of Professional Judgment Cost Elements**  
**(Using current salary levels with cost of additional days calculated separately)**

Element	Amount (\$000s)
K-12 Teachers	1,640,563.2
Specialist Teachers	319,781.1
Instructional Facilitator/Curriculum Coord.	70,048.4
Tutors	95,389.9
Mild/Moderate Special Ed. Teachers	313,714.9
Speech Teachers	42,812.9
ELL Teachers	56,767.3
Media Specialists	33,807.4
Technology Teachers/Specialists	70,007.0
Permanent Substitutes	70,007.0
Pupil Support Professionals	249,560.5
Aides	86,089.7
Principals (12 month)	98,199.5
Assistant Principals	31,000.6
School Secretary (12 month)	30,679.4
Other Clerical	114,768.8
Additional 15 Days Professional Staff	242,470.3
Additional 5 Days for Classified Staff	5,744.6
<b>Total Unadjusted Staff Costs</b>	<b>3,571,412.8</b>
Professional Development Costs (50/pupil)	32,606.6
Technology Costs (214/pupil)	139,556.0
Instructional Materials (250/pupil)	163,032.7
Extra Duty Pay	30,309.0
Substitute Days (11 days per teacher net of permanent substitutes)	18,986.3
<b>Total Unadjusted Non-Salary Costs</b>	<b>384,490.6</b>
<b>Total Unadjusted Costs</b>	<b>3,955,903.4</b>

**Table 5**  
**Summary of Total K-12 Costs for the Professional Judgment Model**

Row Number	Function	Description	Amount (\$000)
<b>Net Total Current Expenditures</b>			3,894,063.40
<b>Functions Carried Forward unchanged</b>			
	0000	Untracked	497.30
	2300	District Administrative Support Services	117,488.90
	2500	Business Support Services	47,927.60
	2600	Plant Operations & Maintenance	351,307.00
	2700	Student Transportation	235,275.20
	2800	Central Office Support Services	83,639.50
	2900	Other Instructional Support Services	610.7
	3100	Food Services Operations	233,542.90
	3300	Community Service Operations	55,435.00
	3900	Other Non-Instructional Services	104.3
	4100-5100	Capital Expenditures	529,452.60
		Less Fund 360 Bond Proceeds	(304,252.20)
		Plus Fund 360 Operating Expenditures	57,275.60
	5200	Transfers (Excluded from Analysis)	0
1	<b>Total Functions Not Changed in the Model</b>		1,408,304.40

**Table 5 (Continued)**  
**Summary of Total K-12 Costs for the Professional Judgment Model**

<b>Row Number</b>	<b>Function</b>	<b>Description</b>	<b>Amount (\$000)</b>
	<b>Additions to Excluded Functions 2100 and 2200 for Estimated Central Office Expenditures</b>		
		Low Incidence Special Education Teachers (40% of all Exceptional Child Teachers)	94,627.30
		Other Central Office Staff	67,929.80
2		<b>Total</b>	<b>162,557.10</b>
3	<b>Total of Expenditures Not Changed in the Model (Rows 1 plus 2)</b>		<b>1,570,861.50</b>
	<b>Functions Replaced by the Model</b>		
	1000	Instruction	2,000,852.30
	2100	Student Support Services	127,989.40
	2200	Instructional Staff Support Services	155,030.70
	2400	School Administration Support Services	201,886.50
4	<b>Total Current Costs of Functions Replaced by the Model</b>		<b>2,485,758.90</b>

**Table 5 (Continued)**  
**Summary of Total K-12 Costs for the Professional Judgment Model**

Row Number	Function	Description	Amount (\$000)
5		<b>Prof. Judgment Model Costs Including Extra Days as specified in Table 1</b>	<b>3,955,903.40</b>
6		<b>Total K-12 Expenditures under Professional Judgment Model (sum of rows 3 and 5)</b>	<b>5,526,764.90</b>
7		<b>Professional Judgment Total with adjustments for cost differences</b>	<b>5,717,318.30</b>
		<b>Additional Components</b>	
8		Net Cost of SREB Average Salary	-
9		Net Cost of National Average Salary	291,377.50
10		Cost of adopting 3:1 student/computer ratio (\$50/pupil)	33,727.10
11		Net cost of 3-4 year old preschool @ 150% of poverty	176,000.00
12		<b>Potential total of all components (sum of rows 7-11)</b>	<b>6,218,422.90</b>

## 5. CONCLUSIONS

This document describes the results of an extensive professional judgment adequacy study conducted for the State of Kentucky. The model for which we have estimated costs was developed by teams of Kentucky professional educators who generously shared their knowledge and expertise with us on four separate occasions during the first three months of 2003. The costs of the model they developed were estimated by our research team and are reported in this document.

Clearly, the costs of this model are both substantial, and considerably higher than the results of our Phase I adequacy study which was based on the state-of-the-art, or evidence based, approach for determining adequacy.

The two methodologies produced additional cost estimates that differed by about \$1,259 million. The major differences in the cost estimates from these two methodologies derive primarily from four major aspects of the professional judgment recommendations and are as follows.

- The additional cost for the extra student and teacher days, i.e., the extended teacher contracts, was about \$257 million.
- The additional costs for the instructional aides were about \$86 million.
- The additional costs for the class sizes of 20 (versus class sizes of 25) for grades 4-12 were about \$414 million.
- The additional costs for the additional special education teachers, tutors and family support personnel were about \$488 million.

The delineation of the costs of these different recommendations provides Kentucky with both the programmatic and fiscal data to assess the differences in the recommendations

and the costs from the two different studies. If the state wishes to accept any of the more generous recommendations of the professional judgment panels, the above cost estimates indicate how much each such recommendation would cost, in comparison to the Phase I, state-of-the-art or evidence-based approach to determining school finance adequacy for Kentucky.

## REFERENCES

- Alexander, Kern, John Augenblick, William Driscoll, James Guthrie, & R. Levin. (1995). Proposals for the Elimination of Wealth-Based Disparities in Public Education. Columbus, OH: Department of Public Instruction.
- Augenblick, John, Myers, John, Silverstein, Justin, and Barkis, Anne. (2002). Calculation of the Cost of a Suitable Education In Kansas 2000-01 Using Two Different Analytic Approaches. Denver, CO: Augenblick and Myers.
- Augenblick, John, Myers, John, Silverstein, Justin, and Barkis, Anne. (2002). Calculation of the Cost of a Suitable Education In Kansas 2000-01 Using Two Different Analytic Approaches. Denver, CO: Augenblick and Myers.
- Augenblick, John. (2001). Calculation of the Cost of An Adequate Education in Maryland in 1999-2000 Using Two Different Analytic Approaches. Denver, CO: Augenblick and Meyers.
- Augenblick, John. (1997). Recommendations for a Base Figure and Pupil-Weighted Adjustments to the Base Figure for Use in a New School Finance System in Ohio. Columbus, OH: Ohio Department of Education.
- Calvo, N. Picus, L.O., Smith, J.R., and Guthrie, J.W. (2000). A Review of the Oregon Quality Education Model. Davis, CA: Management Analysis & Planning. Prepared for the Oregon Department of Education
- Chambers, J.G. (1995). "Public School Teacher Cost Differences Across the United States: Introduction to a Teacher Cost Index (TCI)," *Developments in School Finance*. Retrieved from the World Wide Web: <http://www.ed.gov/NCES/pubs/96344cha.html>
- Chambers, Jay & Thomas Parrish. (1994). "State-Level Education Finance." In Herbert J. Walberg (Ed.), Advances in Educational Productivity (pp. 45-74). Greenwich, CT: JAI Press.
- Chambers, Jay, & Thomas Parrish. (1983). The Development of a Resource Cost Model Funding Base for Education Finance in Illinois. Stanford, CA: Associates for Education Finance and Planning.
- Duncombe, William, John Ruggiero, & John Yinger. (1996). "Alternative Approaches to Measuring the Cost of Education." In Helen F. Ladd (Ed.), Holding Schools Accountable: Performance-based Reform in Education, (pp. 327-356). Washington, DC: The Brookings Institution.
- Guthrie, James & Richard Rothstein. (1999). Enabling 'Adequacy' to Achieve Reality: Translating Adequacy into State School Finance Distribution Arrangements. In

- Janet Hansen and Rosemary Chalk, Eds. Equity and Adequacy in Education Finance: Issues and Perspectives (pp. 209-259). Washington, DC: National Academy Press.
- Guthrie, James et al. (1997). A Proposed Cost-Based Block Grant Model for Wyoming School Finance. Davis, CA: Management Analysis and Planning Associates, LLC. Available online at: <http://legisweb.state.wy.us/school/cost/apr7/apr7.htm>
- Imazeki, Jennifer & Andrew Reschovsky (1999). "Measuring the Costs of Providing an Adequate Public Education in Texas." In Howard Chernick (Ed.), Proceedings of the 91<sup>st</sup> Annual Conference on Taxation (275-290). Washington, DC: National Tax Association.
- Ladd, Helen, & Janet Hansen. (1999). Making Money Matter. Washington, DC: National Academy Press.
- Management Analysis & Planning. (2001). A Professional Judgment Approach to Determining Adequate Education Funding in Maryland. Davis, CA: Author.
- Odden, A., Fermanich, M., and Picus, L.O. (2003). *A State of the Art Approach To School Finance Adequacy in Kentucky*. Report prepared for the Kentucky Department of Education.
- Odden, Allan (1997). How to Rethink School Budgets to Support School Transformation. Getting Better by Design Series, Volume 3. Arlington, VA: New American Schools.
- Odden, Allan , & Lawrence O. Picus. (2000). School Finance: A Policy Perspective: Second Edition. New York: McGraw Hill.
- Odden, Allan, Sarah Archibald & Mark Fermanich. (2003). Rethinking the Finance System for Improved Student Achievement. In William Boyd, Ed. American Educational Governance on Trial: Change and Challenges. Chicago: National Society for the Study of Education.
- Odden, Allan. (1998). Recommendations for Resolving New Jersey Abbott v. Burke IV, after the November and December 1997 Hearings. Report to the Honorable Judge Patrick Michael King.
- Picus, Lawrence O., Allan Odden & Mark Fermanich. (2001). Assessing the Equity of Kentucky's SEEK Formula: A Ten-Year Analysis. Report prepared for the Kentucky Department of Education.
- Reschovsky, Andrew & Imazeki, Jennifer. (1999). "Reforming State Aid to Achieve Educational Adequacy: Lessons from Texas and Wisconsin." In Barbara A. Nye and Gary L. Peeveley (Eds.), Education Funding Adequacy & Equity in the Next

- Millennium: Conference Proceedings. Nashville, TN: Tennessee State University.
- Reschovsky, Andrew & Imazeki, Jennifer. (2002). Let No Child Be Left Behind: Determining the Cost of Improving Student Performance. Madison, WI: Finance Center of the Consortium for Policy Research in Education, May.
- Reschovsky, Andrew & Jennifer Imazeki. (2001). Achieving Educational Adequacy Through School Finance Reform. Journal of Education Finance.
- Reschovsky, Andrew & Jennifer Imazeki. (April, 2000). Developing a Cost Index for School Districts in Illinois. Paper submitted to the Illinois State Board of Education.
- Yinger, John. (2001). Fixing New York's State Education Aid Dinosaur: A Proposal. Policy Brief, No. 21/2001. Syracuse, NY: Syracuse University, Maxwell School of Citizenship and Public Affairs, Center for Policy Research.