

# Proposed Methodology for Establishing Adequate Funding Levels in the State of Maryland

Prepared for  
Maryland State Department of Education

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*The Maryland General Assembly enacted Chapter 288, Acts of 2002 – the Bridge to Excellence in Public Schools Act, which established new primary state education aid formulas based on adequacy cost studies using the professional judgment and successful schools/districts methods and other education finance analyses that were conducted in 2000 and 2001 under the purview of the Commission on Education Finance, Equity and Excellence. State funding to implement the Bridge to Excellence Act was phased-in over six years, reaching full implementation in fiscal 2008. Chapter 288 required a follow up study of the adequacy of education funding in the State to be undertaken approximately 10 years after its enactment. The study must include, at a minimum, adequacy cost studies that identify a base funding level for students without special needs and per pupil weights for students with special needs to be applied to the base funding level, and an analysis of the effects of concentrations of poverty on adequacy targets. The adequacy cost study will be based on the Maryland College and Career-Ready Standards (MCCRS) adopted by the State Board of Education and include two years of results from new state assessments aligned with the standards, which are scheduled to be administered beginning in the 2014-2015 school year.*

*There are several additional components mandated to be included in the study. These components include evaluations of: the impact of school size, the Supplemental Grants program, the use of Free and Reduced Price Meal eligibility as the proxy for identifying economic disadvantage, the federal Community Eligibility Program in Maryland, prekindergarten services and funding, the current wealth calculation, and the impact of increasing and decreasing enrollments on local school systems. The study must also include an update or revision of the Maryland Geographic Cost of Education Index.*

*Augenblick, Palaich and Associates, in partnership with Picus Odden and Associates, and the Maryland Equity Project at the University of Maryland, will submit a final report to the State no later than October 31, 2016.*

This report, required under Section 3.2.1 of the Request for Proposals (R00R4402342) describes the approach APA and its partners will take to estimate a per student base funding level and per student weights for those students with special needs such as an impoverished background, Limited English Proficiency, and cognitive or physical disabilities. The report describes the study team’s approach as presented in its proposal to the Maryland State Department of Education (MSDE), input on that approach received since work began on the study, and the study team’s proposed changes to its approach.

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## **Introduction**

In March of 2014, the Maryland State Department of Education issued a Request for Proposals (Maryland State Department of Education, 2014) for a school funding adequacy study “using at least two methods” along with related analyses of the State’s school finance system, that in total represent a comprehensive assessment of how the State finances its public schools. Augenblick, Palaich and Associates (APA), in partnership with Picus Odden and Associates (POA), and the Maryland Equity Project at the University of Maryland (MEP), responded with a proposal for a study making use of three of the four generally accepted adequacy methods, successful schools/districts, evidence-based and professional judgment (Augenblick, Palaich and Associates, et al., 2014). The RFP requires this follow up report, which revisits the adequacy approach and details changes, if any, to the approach originally described in the APA proposal. Potential changes to the approach may have been elicited due to input from Maryland State Department of Education (MSDE) staff, stakeholders, or other considerations that arose since the start of the project. This report briefly discusses the approaches available for estimating adequate funding for schools, reviews the approach originally outlined in APA’s proposal, discusses key input received since the start of the project, and describes the changes to the methodology the study team will use to estimate an adequate level of education funding for the State over the next two years.

## **Estimating Adequacy**

The concept of adequacy in terms of education funding grew out of the standards-based reform movement (Odden & Picus, 2014). As states implemented specific learning standards and performance expectations for what students should know, along with consequences for those districts and schools failing to meet those expectations (and, eventually federal expectations imposed through the No Child Left Behind legislation), the focus of school finance turned to the question of what level of resources was necessary to provide districts, schools, and students a reasonable opportunity to achieve to standard. Over the past two decades, researchers have developed four approaches for estimating a level of funding necessary for providing all students with an opportunity to receive an adequate education. These estimates include a base cost amount per student sufficient for adequately educating students with no special needs, adjustments for providing services for special needs students, such as at-risk, English language learners (ELL), and students with disabilities, and for the general operations of districts and schools.

The four generally accepted approaches for estimating adequate education funding are: (1) the evidence-based (EB) approach; (2) the successful schools/districts (SSD) approach; (3) the professional judgment (PJ) approach; and (4) the cost function (CF) 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 Evidence-Based Approach***

The evidence-based approach assumes that information gathered from research exists to define the resource needs of a hypothetical school or school district to assure that its students have the opportunity to meet state standards. The approach not only estimates resource levels, but also specifies the programmatic ways such resources may be used effectively as suggested by the research. The strength of the approach is that it incorporates the latest research about the way resources can 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 found in schools, and the fact that the approach may not be state specific. In recent years the approach has made use of local panels of highly qualified educators and case studies of high performing schools to tailor the evidence-based model to specific state contexts.

### ***The Successful Schools/Districts Approach***

The successful schools/districts approach makes use of the actual expenditure levels of those schools currently meeting state performance objectives to determine an adequate per student base cost amount. This approach also assumes every school and school district should have the same level of base funding that is available to the most successful schools and districts along with additional funding to provide services and programs for students with special needs (e.g. at-risk, English language learners, and students with disabilities) and for districts with special circumstances. This approach is typically conducted at the district level. However, in Maryland, where there are relatively few school districts, this approach will be applied at the school level.

The SSD approach is most useful when the State has specified its student outcomes and input objectives, and schools that have met them can be identified through aligned state assessments. The advantages of the approach are that it is empirical and tangible, it is based on current practices to meet the standards, it is based on the spending of districts that are currently meeting standards, and that it assumes that resources can be used in very different ways in various successful districts. The disadvantages are that it focuses only on the cost of providing services to students with no special needs in districts without special circumstances, and that it only generates a base cost figure. Other methods must be employed for making adjustments for students with special needs and for districts with special circumstances. Because the output of this approach is a per student base funding amount, it also does not offer schools or school districts a “theory of action” or set of recommendations as to how resources could be used to improve student achievement.

### ***The Professional Judgment Approach***

The professional judgment approach relies on the views of experienced educational service providers to specify the kinds of resources and the quantities of those resources that would be necessary to achieve state standards. 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 (professional judgment panels) 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, 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.

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 also requires a large enough sample of districts to produce valid results. In Maryland, where there are only 24 school districts, there are not enough districts to produce statistically valid and reliable results and there is no research to support estimating a cost function at the school level. Furthermore, few states have used the statistical approach alone to determine the parameters of a school finance formula. However, both Texas and Kansas have relied extensively on cost functions in the past, and the 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.

## **APA's Proposed Approach**

In APA's proposal to the MSDE, the study team proposed using three of the four generally accepted adequacy approaches: 1) evidence-based; 2) successful schools/districts; and 3) professional judgment. The project team concluded the cost function approach was inappropriate for the State of Maryland due to the small number of school districts in the state. The study team also determined the cost function method could not be used successfully at the school level due to the lack of detailed school level expenditure data. Further, applying this method to the school level raises several significant, and to date, unresolved methodological issues. The following describes each of the three approaches to estimating adequacy in Maryland as presented in APA's proposal.

### ***The Evidence-Based Approach***

The evidence-based approach is being led by Allan Odden and Lawrence Picus of POA. Odden and Picus were the originators of this approach and have applied it in more states than any other

research team.<sup>1</sup> The following provides a brief overview of the theoretical basis and implementation of the approach

The EB model relies on a school improvement model that allocates resources for educational strategies that current educational research suggests lead to improvements in student learning. The model relies on two major types of research:

1. Reviews of research on the student achievement effects of educational strategies to identify effective strategies for inclusion in the EB model. In recent years the EB model has incorporated a growing number of randomized controlled trials (RCTs) that have been conducted on educational strategies to identify components of the model.
2. Case studies of schools and districts that have dramatically improved student performance over a four to six year period as measured by state assessments.

The evidence-based school improvement model includes ten improvement strategies that, if adopted by districts, research suggests should lead to significant improvements in academic achievement for all students and substantially reduce student achievement gaps linked to demographic variables. The ten school improvement strategies underpinning the approach consist of:

1. Analyzing 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, then the use of formative and benchmark assessments over time to help tailor instruction to precise student needs and to identify and monitor interventions for students with special needs.
2. Setting higher goals, including aiming to educate 95% of the students in the school to proficiency or higher on state assessments, seeing that a significant portion of the school's students reach advanced achievement levels, and making significant progress in closing the achievement gaps linked to demographics.
3. Reviewing evidence on good instruction and effective curriculum. Successful schools ensure that their curriculum is aligned with standards and rigorous, and over time, create their own specific view of what good instructional practice is to deliver that curriculum.
4. Investing heavily in teacher training that includes intensive summer institutes and longer teacher work years. Districts must 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. Supporting struggling students by providing some combination of tutoring and other supplemental Tier 2 interventions in 1:1, 1:3, or 1:5 tutor-student ratio formats via the Response to Intervention (RTI) process. This also includes extended day, summer school, and English language development for all ELL students.

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<sup>1</sup> See the study team's report on prior adequacy studies – *A Comprehensive Review of State Adequacy Studies Since 2003*.

6. Creating smaller classes in early elementary years, often lowering class sizes in grades kindergarten through three to 15 students.
7. Restructuring the school day to provide more effective ways to deliver instruction. This includes multi-age classrooms in elementary schools, and block schedules or double periods of mathematics and reading in secondary schools. Schools also protect instructional time for core subjects, especially reading and mathematics.
8. Providing strong leadership support to the principal and teacher leaders around data-based decision making and improving the instructional program.
9. Fostering professional school cultures characterized by ongoing discussion of good instruction and by teachers taking responsibility for student performance.
10. Bringing 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 to support districts and schools in dramatically improving student performance. The review of the literature on school improvement is supplemented with case studies of schools and districts that are dramatically improving student achievement. Combined, the analysis of current research and case studies produce a set of resources that the study team has 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, which are designed to prepare all students to be college and career-ready for the emerging global, information-based economy. POA will conduct the EB study and is working with the Maryland Equity Project on completing the parallel case studies in Maryland to ensure that the overall model and set of recommendations are specifically tailored to the Maryland context.

### **EB Method**

The approach to using the EB method for Maryland mirrors and builds on the improvement model described above. The EB analysis assumes that implementation of Maryland's College and Career-Ready Standards implies significant student performance increases are needed and that the changes made to the model for this study will incorporate findings from the school improvement case studies conducted in Maryland. The adjustments made to the EB model in the Maryland context will be based on advances in educational research, changes in policy and practice around the country, and other adjustments made to the overall analytical approach resulting from continued review of the research and the growing body of case studies. The EB component of this study 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 such as 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

The EB model also will address recommendations for students with special needs:

- Tutors as the first Tier 2 intervention in the RTI framework
- Extended day programming
- Summer school
- Extra pupil support
- ELL students
- Students with disabilities
- Alternative schools

The approach will be to review the research on each of the topics identified above, update the findings that have been previously published (Odden & Picus, 2014) and used in other state studies by incorporating new research findings, and determining how the per pupil base funding amount and weights should be updated or modified to meet the needs of Maryland. The EB approach will augment this analysis with more recent literature, which may include new random controlled trials, and with the results of school case studies that are being conducted in Maryland as part of the overall project.

### **EB Model**

In the EB model, current educational research findings are operationalized into a theory of action describing the organization of schools. The model establishes suggested pupil-teacher ratios for core



subjects and provides resources for elective teachers. It includes a set of strategies for helping struggling students through extra time in core classes, extended day programs, and summer school. The model also provides additional resources for students with special needs, such as those from low-income families, students who are ELL and students with disabilities. School level staffing includes resources for instructional coaches, guidance and health professionals, pupil support staff, school level administration, clerical support, and other personnel (e.g. librarians, technology support staff, custodians, and other support workers). Resources are also provided to support the central operations of school districts.

The EB approach uses a 3,900 student prototypical district with four 450 student kindergarten through fifth grade elementary schools, two 450 student sixth through eighth grade middle schools, and two 600 student ninth through twelfth grade high schools. It estimates the resources needed in each prototypical school, and adds to that, resources for central office functions, operations and maintenance, and other district costs. This leads to an estimated per pupil funding level. To this figure is added the estimated per pupil costs of providing programs for students with special needs such as compensatory education, ELL, and special education services. Finally, the EB model includes adjustments for small school districts to accommodate the diseconomies of scale associated with the operation of these districts. This adjusted figure is used to estimate the per pupil base cost and weights for students with special needs. 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 the EB model uses 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, the EB model can incorporate the results from the professional judgment panels to modify the prototypical district size, if necessary.

A Microsoft Excel-based simulation will be used to model and develop the EB estimate for a base per pupil cost, as well as appropriate weights for at-risk students, ELL students, and students with Individualized Education Programs (IEPs). The model will be designed so that each of the cost factors (i.e. class size or teacher salaries) can be modified to produce new per pupil figures. Once the base per pupil figure is determined, weighting factors for at-risk, ELL and special education students can be determined as well.

The Excel model will also incorporate comprehensive prekindergarten programming. The elements of the prekindergarten 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 when 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 components of the proposed project.

### **EB Panels**

Similar to the professional judgment approach described below, the EB approach will engage four panels made up of accomplished practitioners to review the EB model and provide Maryland-specific suggestions for how the EB model may be adjusted to reflect Maryland circumstances. Four geographically diverse panels will be established consisting of 18 participants each. Ideally, the goal is

for half of each panel to consist of teachers, with remaining participants made up of principals, assistant principals, superintendents, other central office administrators, and school board members. If possible, two panels will be established in urban areas (one each in the Washington and Baltimore metro areas), and two panels in less urban areas (one in the western part of the state, the other in the eastern part of the state).

### ***Successful Schools/Districts Approach***

The SSD approach is being led by Mark Fermanich and Justin Silverstein of APA. APA was the originator of this approach and has used it in numerous state adequacy studies. The timeline for this approach is to complete the selection of successful schools, that is those high performing schools meeting specific performance criteria, in early 2015, produce preliminary results in the summer or fall of 2015, and complete final results and recommendations by early fall of 2016.

The project team will employ the successful schools/districts approach as one way to determine an adequate base level of funding for Maryland. Typically, the SSD approach is conducted at the district level. However, with only 24 school districts, Maryland has too few school districts to produce precise and reliable results. Therefore, the Maryland analysis will use data 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 SSD approach is to: 1) identify high performing schools and schools that are dramatically improving; 2) analyze school spending levels (excluding spending for student need-based programs such as special education or ELL); and 3) determine a per pupil base spending amount from the school expenditure analysis. Each of these steps is described in more detail below.

### **Successful Schools/Districts Method**

#### ***Identifying High Performing Schools***

In selecting successful schools, APA will attempt to select schools from the following four performance categories: 1) schools that have been consistently high performing overall over a six year period; 2) schools that have significant growth in student learning over a six year time period; 3) schools that have reduced the achievement gap between poverty and non-poverty students; and 4) schools that have dramatically improved the performance of minority, low income, ELL, and/or special education students. To avoid selecting schools with high growth but low overall attainment, the schools selected in categories 2 through 4 must also demonstrate strong overall student performance. More specific performance criteria for each group of schools will be established after a thorough analysis of school level state assessment data. For example, an initial analysis of school level state assessment results suggests that overall high performing schools must consistently meet or exceed a standard of 85% or 90% of all students scoring proficient or above on a composite measure of state reading, math, and science assessments. High growth schools must have produced overall growth of at least 50% for all students over the six years of available assessment data. In order to incorporate the new Partnership for Assessment of Readiness for College and Careers (PARCC) assessment data, anticipated to become available statewide for the first time in the summer or

fall of 2015, the schools that were identified as high performing using the Maryland School Assessment (MSA) and High School Assessment (HSA) data will be re-evaluated when results from the PARCC assessments are available in 2014-15 and 2015-16. If any of the identified successful schools' performances under PARCC decreases dramatically compared to other similar schools, they may be removed from the successful schools database.

### *Analysis of School Expenditures*

Once high performing schools have been identified, the study team will work to collect school expenditure data. Because Maryland only collects spending data at the district rather than school level, the study team will develop a school expenditure data collection tool, similar to the tool or template used for APA's earlier study for the Thornton Commission, to gather comprehensive and accurate school level expenditure data. Researchers will meet with district administrators in those districts from which schools are selected at the start of the analysis to facilitate expenditure data collection. In the earlier APA study, data collection was limited to 59 high performing schools. The study team will explore whether the use of more recent technology, such as a web-based survey tool, may facilitate the collection of data from a larger number of schools. To the extent possible, existing state and district data sources will be used for the collection of the district level expenditures that will 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, 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 consists of central office costs, including general support services, business support services, centralized support services, and instructional administration and support. These data will be used to determine the overall district administration costs, which will then be allocated to the selected schools based on each school's percent of district wide enrollment. The final area, other costs, includes those areas not specifically addressed by the PJ panels, such as student personnel services, student health, operation of plant, maintenance, 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 the base cost is the only variable of interest for the SSD analysis, spending on programs for students with special needs, such as low-income, special education, and ELL will be excluded. The expenditure data will then be standardized across the participating schools and a weighted average base cost per student will be calculated for each school level - elementary, middle, and high school. From these, a single base cost per pupil will be derived that is weighted by the distribution of students across the three levels. If applicable, the study team will also look at how base costs differ by school characteristics such as need level, size, or locale.

Because the SSD approach only produces an estimate of an adequate per pupil base cost, the results from the EB and PJ studies will be used to determine what the appropriate per pupil funding weights should be to address students with specific needs such as low income students, ELL students, students with disabilities, or gifted students.

### ***Professional Judgment Approach***

The professional judgment approach is being led by Justin Silverstein and Amanda Brown of APA. APA has employed the PJ approach in more adequacy studies than any other research group. The timeline for this approach is to begin revising PJ materials in December of 2014, holding PJ panels in April and May of 2015, producing preliminary results in the winter of 2015, and completing final results and recommendations by early fall of 2016.

The PJ approach is the most widely used adequacy approach and is unique because it allows for 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 all students, both at the school and district levels. Examples of the types of resources discussed include personnel full-time equivalent (FTE) positions, such as teachers, pupil support, and administrators; non-personnel costs such as supplies and materials, textbooks, and assessment costs; technology hardware and software; and additional interventions such as extended day 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 included in the base are identified for students with special needs, such as at-risk, ELL, and special education. Further, the approach allows for an analysis of the impact of school and district size on resource needs.

### **PJ Method**

In the refined PJ approach, multiple rounds of panels are employed to review and build upon the work of prior panels. Each panel includes experienced and well-regarded educators from a variety of positions who work in successful schools and districts in the state, 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. These resources include personnel, non-personnel costs (such as supplies and materials), technology, and intervention programs such as summer school and extended day programs. The special needs panels review the work of the school level panels, and then identify the additional resources and interventions needed to serve students with special needs such as at-risk, ELL, and special education. APA has found that, due to the special challenges involved with getting a high percentage 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 add the additional district level resources needed to support schools. A separate CFO

panel will follow to review all school and district level 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.

Over time, APA has 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 and literature review conducted for the EB method, 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.

### **PJ Panels**

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. First, it allows for the separation of school level resources from district level resources. Second, multiple panels can study schools and districts of varying sizes so that the potential impact of school or district size on cost may be incorporated. Finally, by using multiple, tiered panels the recommendations of each panel can be reviewed by one or more subsequent panels.

The panels will include a mix of the following:

- Three to four school level panels to examine the school level resources needed to meet Maryland's College and Career-Ready Standards. Panels will address resource needs in different size elementary, middle, and high schools. The specific school sizes to be analyzed will be based upon average existing Maryland school sizes, 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 the 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, ELL, 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.

## **PJ Model**

After resources have been identified and rigorously reviewed through 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. These cost components are then used to allocate resources to hypothetical schools at each level of schooling (elementary, middle school and high school), as well as one or more hypothetical districts. The hypothetical school and district enrollment sizes will be determined by an analysis of actual school and district sizes in the state. The final result is a fully resourced hypothetical school district that is representative of the actual districts found in the state.

This process will allow the study team to develop a base cost, a series of weights for special needs, and possibly adjustments for school size. A per pupil base cost and weights for students with special needs is estimated by building up the cost components for each of the school types and district administration. All of the analyses are performed using Microsoft Excel software.

## ***Combining the Results of the Three Approaches to Estimate an Adequate Base Cost and Weights***

Once the analyses for all three approaches have been completed, the results of each will be analyzed together. Table 1 below, describes the information that each approach contributes to the analysis. 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 will determine and explore the causes of any differences in the resulting per student base costs and weights estimated by each of the three approaches. Once these causes are understood, the study team will work with MSDE to determine a reasonable estimate, or range of estimates, for a per student base cost and weights that meets the needs of MSDE for estimating the resources required for all students to meet the Maryland College and Career-Ready Standards. The study team will also work with the MSDE to determine the appropriate adjustments for students with special needs and any necessary adjustments for school or district size differences.

**Table 1: Adequacy Analyses**

	Professional Judgment	Successful Schools/Districts	Evidence-Based
<b>KEY FUNDING FORMULA ELEMENTS</b>			
<b>IDENTIFY BASE ADEQUACY COST</b>	X	X	X
<b>Student-Driven Adjustments to the Base Adequacy Cost</b>			
Poverty/At-Risk	X		X
English Language Learners	X		X
Special Education	X		X
Gifted and Talented	X		X
<b>District/School-Driven Adjustments to the Base Adequacy Cost</b>			
District Size Differences	X		X
School Size Differences	X		X
<b>Information on Interventions and Resource Use</b>			
Interventions	X		X
Resource Use	X		X

**Case Studies of High Performing and Dramatically Improving Schools**

In addition to the three approaches to estimating adequacy described above, the project team will conduct multiple case studies of high performing and improving schools in Maryland. The Maryland Equity Project, along with POA, will lead this work. Findings from these case studies will be used to make adjustments, where appropriate, to the evidence-based and professional judgment models by examining in greater detail the specific programs and strategies high performing or significantly improving schools in Maryland have found effective in raising the achievement level of all students, and especially students with special needs. Case study schools will be selected using performance criteria similar to those used for selecting schools for the SSD approach. These consist of the following four performance categories:

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 students in poverty and more affluent students; and
4. Schools that have dramatically improved the performance of minority, low-income, ELL, and/or special education students.

To identify schools in each category, the project team will use specific criteria derived from the available state assessment data and input from MSDE. Schools that are identified as high performing using appropriate state assessment data will be re-evaluated when results from the PARCC assessments are available in 2014-15 and 2015-16. If any of the case study schools' performances under PARCC decrease dramatically compared to other similar schools, they may be removed from the case study results.

A structured case study protocol will be used for all of the cases to provide 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 student demographics.
- An overview of the changes in student learning over a 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, who are ELL, and who receive special education services.
- A description of the goals 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 preparation time are provided and utilized.
- The school's curriculum and instructional strategy, including a description of the effective 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 students with special needs used at the schools, including individual and small group tutoring, extended day and summer school programming, structures for providing services to students with disabilities, and structures and strategies for delivering services for ELL students. The degree to which these strategies are embedded in a RTI framework will also be explored.
- The professional development in which the schools engage, including summer institutes, training during the year, and the use of instructional coaches. Researchers 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 needs.
- A description of the density of leadership, including the extent to which teachers perform instructional leadership roles.

At a minimum, the following staff will be interviewed in each school:

- The principal;
- Instructional coaches; and
- Other teacher leaders and key teachers, including teachers providing an array of extra help strategies.

Many of the interviews will be done individually, but in some cases groups of two or three teachers will be interviewed. The total time investment expected for each case is expected to total ten days per school, including three days for planning, scheduling interviews, and reviewing school improvement plans and other relevant documents; one to two days for interviews; and five days for case write up and editing following internal reviews and a review by each school principal.

A report will be drafted summarizing the findings of each of the case study schools. A cross-case report will also be written to summarize the findings across the schools. Each of the case study reports will include a table showing school staff by the staffing categories used with the evidence-based and professional judgment models. These staffing tables will provide the detail we need to compare staffing recommendations from the evidence-based and professional judgment methods to those in improving Maryland schools.

## **Adjustments to Proposed Adequacy Approach**

The sections above described the requirements of MSDE's RFP for an adequacy analysis for the State of Maryland and the proposal that APA and its partners submitted in response. This section will describe the avenues of input received in regard to the proposed adequacy approach and changes to the approach that will be made in response to this input.

### ***Sources of Input on Adequacy Approach***

Over the roughly three-and-a-half months since the project team began work on this project, there have been three primary means for gathering feedback and suggestions pertaining to the approach to estimating adequacy in Maryland. These consist of: 1) meetings with Maryland staff involved with the project, including the Maryland State Department of Education, the Department of Budget and Management, and the Department of Legislative Services; 2) two meetings with the Stakeholder Advisory Group made up of representatives of stakeholder groups appointed specifically to provide feedback and a Maryland perspective for this project; and 3) the report that was submitted to MSDE in

early October on the best practices and findings of adequacy studies conducted nationwide since 2003 (Aportela, Picus, Odden, & Fermanich, 2014).

The subject matter of the feedback received on the study team's approach can be categorized by the following five categories:

1. The appropriate assessment data to use for selecting high performing schools for the case studies and the successful schools/districts analysis;
2. The makeup of the practitioner panels used in the evidence-based and professional judgment studies;
3. Assessing the impact of increasing concentrations of poverty on resource needs; and
4. Other best practices identified in the review of past adequacy studies.

Each of these categories is described in greater detail below.

### ***Appropriate Assessment Data***

APA's proposal to the MSDE, called for using the six most recent years of state assessment data for the analyses for selecting high performing schools for the case studies and SSD study. Multiple years of data are desirable for determining schools that have consistently generated high levels of achievement growth or the narrowing of achievement gaps between disadvantaged and more advantaged students over time. Depending on data availability, this suggests using annual assessment data from either 2007-08 to 2012-13 or 2008-09 to 2013-14. The approach described in the proposal also proposed to focus on mathematics and reading/language arts performance to assess school performance. However, feedback received in the time since the study commenced suggests that a different set of data should be used.

### **Timing of Assessment Data**

When the State adopted new College and Career-Ready Standards in 2012, it continued to administer the MSA for grades three through eight and the Maryland HSA for grades nine through twelve, until the new, aligned PARCC assessments became available in the 2014-15 school year. Following the implementation of the new standards, average performance on the MSA fell by about five to seven percentage points in 2012-13 and 2013-14 because the assessment was not as well aligned with the new standards. The impact on average performance on the HSA was less significant. Because of the misalignment between the new standards and the MSA, MSDE staff recommended that MSA assessment data for the six year period 2006-07 through 2011-12 would provide the most accurate indicator of school performance when selecting high performing elementary and middle schools for case studies and the SSD study. Because the change in standards had less of an impact on HSA results, the most recent HSA data available, 2007-08 through 2012-13, could be used when selecting high schools.

While the study team shared MSDE's concern with the alignment of standards and assessments, it also had concerns about selecting schools on the basis of nearly three year old performance data.<sup>2</sup> Together

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<sup>2</sup> The school performance measure used is a composite of the percent of students across all grades and subjects in a school scoring proficient or advanced. This measure is further broken out by minority/non-minority and by free

with MSDE staff, a revised approach to the assessment data for use in the selection process was developed as follows:

- For the HSA, the most recently available six years of data will be used, consisting of assessment data for the years 2007-08 to 2012-13.
- For the MSA, initial selection of elementary and middle schools will be carried out using the 2006-07 through 2011-12 assessment data.
- The difference between the 2011-12 to 2013-14 scores of the schools selected through the initial analysis of MSA data will be compared to the mean change in scores for all elementary and middle schools. Selected schools with a falloff of more than one standard deviation will be removed from the school list.
- When PARCC data become available in 2014-15 and 2015-16, selected schools that perform significantly worse on PARCC relative to other schools, than they did on the MSA/HSA will be removed from the list of high performing schools. While the specific criteria will not be determined until the PARCC data can be analyzed, the study team anticipates measuring relative change by calculating the number of standard deviations from the mean for each of these schools using the most recent MSA/HSA data and comparing the results to the corresponding measure using PARCC data. Selected schools with significant decreases in their relative performance will be excluded from the analysis. When the second year of PARCC data becomes available in 2015-16, the same analysis will be undertaken by comparing the most recent MSA/HSA performance data to the average of the two PARCC scores. The study team will work with MSDE staff to determine a feasible approach for incorporating the second year of PARCC data given that the anticipated release date for the data will be very near the due date of the study's final report.

### **Including Science Assessment Data**

The original proposal suggested that mathematics and reading/language arts state assessment data would be used as the measure for assessing school performance when selecting schools for case studies and the SSD study. However, the state's RFP also specifically called for taking into consideration performance on the State's Next Generation Science Standards and MSDE provided detailed assessment data for fifth and eighth grade science and for high school biology. As a result, these science data have been incorporated in the composite MSA and HSA assessment data used for the selection of high performing schools. Incorporating science assessment results will help to provide a more comprehensive measure of school performance and better align study results with the State's performance expectations.

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and reduced price lunch, ELL, and special education students. In the MSA, subjects consist of mathematics, reading, and science (grades five and eight only). In the HSA, the subjects tested are algebra, English and biology.

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### ***Professional Judgment Panels***

APA's proposal to MSDE includes employing the evidence-based and professional judgment approaches as two of the three approaches used in the study of adequate school funding in Maryland. Both of the approaches make use of expert practitioner, or professional judgment, panels. In the evidence-based approach, four panels of highly qualified practitioners, including teachers, principals, and district administrators, will review the base evidence-based model to suggest revisions that reflect the state's learning standards, performance expectations, and educational context. In the professional judgment approach, multiple panels will be provided with a review of the literature on what works, and then be tasked with building hypothetical high performing schools from the ground up. The selection of qualified educators and other participants for both sets of panels is key to producing high quality results. Working with MSDE staff, the study team will use a process for selecting panel participants that draws on an existing process for selecting highly qualified Master Teachers in the state. The Stakeholder Advisory Group created to help advise the study has also recommended including a technology specialist on the district level professional judgment panels. The following summarizes the modifications to the professional judgment panel process that will be made on the basis of this feedback:

- In past studies, APA and POA have typically worked with statewide organizations, such as the state department of education, the teachers' union and the administrators' association, to identify highly accomplished educators and administrators to serve on professional judgment panels. However, because a pool of highly qualified and vetted Master Teachers already exists in the State, the teacher panelists for these studies will be selected from this pool. Other participants, such as school and district central office administrators, will be selected via nominations solicited from the school districts. Instructions describing the desired qualifications of all nominees will be shared with the districts to ensure that all panel members are highly qualified for the work.
- The PJ panels typically include a technology specialist on the school level panels, but not on higher level panels. Members of the Stakeholder Advisory Group convened to advise the State and consultants on this project suggested including technology specialists on the district level panels because technology specialists in Maryland are typically employed at the district level. In response, technology specialists will participate on all of the district panels.

### ***Assessing the Impact of Increasing Concentrations of Poverty on Resources***

Both the evidence-based and professional judgment adequacy approaches provide adjustments that target additional revenues to students with special needs, such as those who are low-income, are English language learners or have cognitive or physical disabilities. However, both methods generally arrive at a resource amount by identifying the staffing numbers, technology, and materials and supplies needed to support a certain case load of students. As the number of identified students in a school increases, the amount of resources also increases. Under this approach, the increase is linear, meaning that each additional student generates the same marginal increase in resources. The RFP requires, and members of the Stakeholder Advisory Group have requested, that the research team also assess whether higher concentrations of low-income students in a school require an exponential increase in

resources. That is, as the concentration of low income students increases, each additional student generates a larger marginal increase in resources than would be generated at lower concentration levels.

While there are several states with school finance formulas that make some type of adjustment for districts or schools with higher concentrations of low-income students, it is not clear whether the research supports such adjustments. However, the study team plans to address this issue through a review of the literature and by specifically asking the professional judgment panels for both the evidence-based and the professional judgment approaches to take rising concentrations of poverty into consideration as they make their recommendations.

### ***Other Best Practices***

In addition to the professional judgment panel improvements discussed above, the study team's review of past state adequacy studies revealed several other notable best practices in adequacy study methodology. These include:

1. A clear focus on improvement of student performance;
2. The value of case studies;
3. The importance of state policy maker and local stakeholder involvement in the process;
4. Combining multiple methods in each state study; and
5. Accurately representing compensation in the analysis.

APA's original proposed methodology clearly incorporates the best practices of clear focus on improving student performance through the use of case studies, selection of high performing schools for the SSD study, and the focus on performing to state standards when resourcing prototypical or hypothetical schools in the evidence-based and professional judgment approaches. Additionally, multiple approaches will be employed to estimate an adequate per student base cost and develop weights for students with special needs. As a result, no revisions to the proposed methodology are required to incorporate these best practices.

Implementing the best practice of engaging state and local policy makers is, for the most part, out of the control of the study team. However, because the study was mandated and is being funded by the state legislature, representatives of three state agencies are involved in the ongoing management of the study, and an advisory group made up of a wide range of state and local stakeholders has been formed to provide input to the study, we believe the conditions of this best practice have also largely been met.

The one area of best practices in which the proposal was silent concerned the specific approach used to determine total employee compensation as accurately as possible. Prior work by the study team and the review of previous adequacy studies revealed that the most commonly used methods of determining the cost of employ benefits, in particular health insurance, often understates the true cost. For this study, in consultation with MSDE, we propose exploring alternative methods to ensure that the cost of fringe benefits is estimated accurately. One approach may be to identify the individual elements of the bundle of items included in fringe benefits (such as health insurance, state retirement contributions,

Social Security and Medicare contributions, and Workers' Compensation Insurance), and their costs to build up to a per full time equivalent (FTE) employee's total compensation package. We will also explore whether using the current cost of health insurance for state employees is a more accurate estimate of an adequate compensation package than other methods, such as using the average health insurance costs currently found in school districts.

## **Conclusion**

The proposal APA and its partners drafted in response to the MSDE's RFP was designed to both meet the requirements of the RFP and make use of state of the art methodologies for estimating the adequacy of state education funding in Maryland. After a thorough review of 39 adequacy studies conducted over the past decade and engaging in conversations about the study with state staff and the Stakeholder Advisory Group, the study team concludes that its basic methodology remains the best approach to estimating adequacy in Maryland, and that the changes described in this report serve to strengthen the overall approach and make it better attuned to the Maryland context.

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